



Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
DEEMED TO BE UNIVERSITY
(An ISO 9001:2015 Certified Institution)



University with Graded Autonomy Status

Periyar E.V.R. High Road, Maduravoyal, Chennai-95, Tamilnadu, India.

MINUTES OF THE XXXVI ACADEMIC COUNCIL MEETING
HELD ON 14.11.2020

The **XXXVI** meeting of the Academic Council was held thro video conferencing on **14.11.2020** at 10.30 am Dr.S.Geethalakshmi, Vice-Chancellor, Chaired the Virtual Meeting. (List of members in attendance enclosed)

ITEM No.:9

9. (a) **To take note of and approve the change in Nomenclature of "B.Sc – Optometry" to "B.Optom" (Bachelor of Optometry)**

The Faculty of Allied Health Sciences has been conducting the following Degree Program

"B.Sc – Optometry"

Faculty of Allied Health Sciences in their Board of Studies Meeting held on 04.08.2020 have decided to change the Nomenclature of the Degree programme from "B.Sc – Optometry" to "B-Optom" (Bachelor of Optomtery) as per the Nomenclature approved by UGC.

The members took note of and approved the above change of the Nomenclature from "B.Sc-Optometry" to **"B-Optom" (Bachelor of Optometry)**.

- (b) **To consider and approve the revision in curriculum and Syllabus of B.Optom from the Academic Year 2020 – 2021.**

Principal – Faculty of Allied Health Sciences informed to the members that the Department Board of Studies has revised the Curriculum and Syllabus relating to the following course in the Faculty of Allied Health Sciences from the Academic Year 2020 - 2021.

> B.Optom

The members took note of the above and approved the same.



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MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B. OPTOM (BACHELOR OF OPTOMETRY)

Regulations, Curriculum and Syllabus

2020



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Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2020-2021. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
 - iii) Physics, Chemistry and Mathematics
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.

- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- a) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- b) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- c) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

Max.Marks- 60 Marks

Duration -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL & VIVA VOICE

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL - 100 Marks

SEMESTER III – SEMESTER VI (FOR ALL SPECIALITIES)

THEORY

Max.Marks - 80 Marks

Duration - 3 Hours

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

PRACTICAL

Max marks:80

| | |
|-------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory & Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION
SEMESTER – I
(B.OPTOM)

TOTAL HOURS : 330

| S.no | PAPER | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|---------------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy –I(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English(IE) | 30 hours | - | - | - | 50 | - | 50 |

UE University Exam
 IE Internal Exam

SCHEME OF EXAMINATION
SEMESTER – II
(B.OPTOM)

TOTAL HOURS: 420

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|----------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy –II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 8 | Computer Science(IE) | 30 hours | - | - | - | 50 | - | 50 |

UE University Exams
IE Internal Exam

**SCHEME OF EXAMINATION
SEMESTER – III
(B.OPTOM)**

Total Hours: 420

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|---|-----------|---|-----------|-------|
| | | Theory | Practical | Continuou s assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Ocular Anatomy and Ocular Physiology- I (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Ocular Anatomy and Ocular Physiology- I (Practicals) (UE) | - | 100 hours | - | 20 | - | 80 | 100 |
| 3. | Geometrical Optics –I & II and Physical Optics (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Geometrical Optics –I & II and Physical Optics (Practicals) (UE) | - | 110 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics and Bio safety(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 7. | Clinics - I(IE) | - | 30 hours | - | - | - | 50 | 50 |

UE University Exams
IE Internal Exam

**SCHEME OF EXAMINATION
SEMESTER – IV
(B.OPTOM)**

Total Hours: 420Hr

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|---|-----------|---|-----------|-------|
| | | Theory | Practical | Continuou s assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Visual Optics I &II (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Optometric Optics I & II And Dispensing Optics (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 3. | Visual Optics I & II And Dispensing Optics (Practicals) (UE) | - | 150 | - | 20 | - | 80 | 100 |
| 4. | Optometric Instruments (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 5. | Clinical Examination Of Visual System(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Nutrition(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 7. | Clinics - II(IE) | - | 30 hours | - | - | - | 50 | 50 |

UE **University Exams**

IE **Internal Exam**

**SCHEME OF EXAMINATION
SEMESTER – V
(B.OPTOM)**

Total Hours: 390Hr

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|---|-----------|---|-----------|-------|
| | | Theory | Practical | Continuou s assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Ocular Diseases - I (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Ocular Diseases- II & Glaucoma (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 3. | Low Vision And Contact Lens (Theory) (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Low Vision And Contact Lens (Practical) (UE) | - | 150 hours | - | 20 | - | 80 | 100 |
| 5. | Systemic Diseases (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Special Clinics – I (IE) | - | 30 hours | - | - | - | 50 | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION

**SEMESTER – VI
(B.OPTOM)**

Total Hours: 390 Hr

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|---|-----------|---|-----------|-------|
| | | Theory | Practical | Continuou s assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Occupational Optometry &Public Health And Community Optometry-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Geriatric Optometry & Paediatric Optometry(-Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 3. | Binocular Vision I&II - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Binocular Vision I&II – Practical (UE) | - | 150 hours | - | 20 | - | 80 | 100 |
| 5. | Sports Vision(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Special Clinics – II (IE) | - | 30 hours | - | - | - | 50 | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION

**SEMESTER – VII & VIII
(B.OPTOM)**

Internship -1 YEAR

| S. No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|---|------------------|-----------|---|------|-----------------------------|------|-------|
| | | Theory | Practical | Continuou s assessment (Internals) | | End Semester Examination | | Total |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Bio-Statistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

UE University Exams
IE Internal Exam

SEMESTER - I

| S.No: | Subject |
|--------------|----------------------|
| 1. | Anatomy – I (UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4. | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I
ANATOMY – I (UE)

Objectives:

At the end of the course the student should be able to:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, sub cellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachial, Triceps brachia, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.

- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
 - **Autonomic Nervous system** –definition and functions
2. **Sense organs**
 - Location and features of the nose, tongue, eye, ear and skin
 3. **Endocrine system**
 - Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOICE

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** With Names & Number Of Bones
3. **Muscles**
 - a. Trapezius
 - b. Latissimus dorsi
 - c. Biceps
 - d. Triceps
 - e. Deltoid
4. **Nervous System**
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - d. Spinal Cord
5. **Special Senses**
 - a. Tongue
 - b. Ear
 - c. Skin
 - d. Eye

6. Viva Voice

- a. Radiology – X rays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

- 1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
- 2. B D Chaurasia: General human anatomy

References:

- 1. B D Chaurasia: Regional Anatomy. Vol I, II,III
- 2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

- Comprehend basic terminologies used in the field of Human Physiology
- Define and describe basic Physiological processes governing the normal functioning of the human body.
- Apply this knowledge in their Allied Health Science practice.

CONTENTS

Unit 1

General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Nerve and muscle

- Nerve structure, classification of nerve fibers,
- Muscles- classification , structure , Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism, types.

Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes –Morphology and functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition & functions of gastric juice.
- Pancreatic juice- composition, functions and regulation of pancreatic juice.
- Bile- composition, functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

Excretory system

1. Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
2. Formation of urine-Filtration, Reabsorption and secretion.
3. Counter-Current mechanism
4. Micturition.

PRACTICAL & VIVA VOICE

- Microscope
- Estimation of Hemoglobin
- RBC
- WBC
- Spotters

Recommended book

1. Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

1. Medical physiology for under graduates by Indhu Khurana,
2. Text Book of Physiology by A.K. Jain for BDS.

BIOCHEMISTRY-I (UE)

Objectives:

At the end of this course the students should be able to:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
 - Classification,
 - Coenzymes,
- Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOICE

1. Reactions of Glucose
2. Reactions of Fructose
3. Reactions of Maltose
4. Reactions of Lactose
5. Tests for Sucrose
6. Tests for Starch
7. Identification of unknown Carbohydrates

SPOTTERS

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenyl hydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

Text books Recommended :

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books :

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOICE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Subhash Chandra Parija – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,Satish Patwardhan – Handbook of Practical examination in Microbiolog

PATHOLOGY-I (UE)

Objective:

At the end of the semester the students should be able to

- To develop better understanding of pathological conditions and their causes.
- To develop knowledge on the diseases of major organs and structures.

Contents

Unit-I. Introduction to cell

- Normal Cell Structure Function

Unit-II. Cell injury and Adaptation

- Causes and Types of Cell Injury
- Cellular Adaptations- (Hypertrophy, Hyperplasia, Atrophy, Metaplasia)
- Necrosis-Definition, Causes, Types with Examples, Morphology
- Apoptosis-Definition, Causes, Morphology
- Pathological Calcification

Unit-III. Inflammation and Repair

- Inflammation-Definition, Types, Cardinal signs
- Acute Inflammation-Vascular events and Cellular events(ONLY NAMES) , Outcomes of Acute inflammation, Morphological types of Acute inflammation(ONLY NAMES), Chemical Mediators(ONLY NAMES)
- Chronic Inflammation- Causes and Granulomatous inflammation
- Wound Healing and Repair- Definition, Steps in wound healing, Factor influencing wound healing, Complications of wound healing(ONLY NAMES)

Unit-IV. Hemodynamic Disorder

- Edema- Definition, Causes and Pathogenesis
- Thrombosis-Definition, Causes and Fate of thrombus
- Embolism-Definition and Types
- Infarction-Definition and Classification
- Shock-Definition, Stages, Types of Shock, Etiopathogenesis of Septic shock

Unit-V.Infectious Disease

- Tuberculosis-Etiology, predisposing factors, primary & secondary tuberculosis and complications
- Leprosy-Etiology, classification, Lepromatous and tuberculoid leprosy

Unit-VI.Neoplasia

- Definition, Nomenclature & Classification
- Characteristics of Benign and Malignant neoplasms,
- Pathogenesis of Cancer(Only Names of Carcinogenic agents)
- Spread of Cancer(Metastasis and Pathways of spread)

Unit-VII.Genetics

- Down syndrome
- Klinefelter syndrome
- Turner syndrome

Unit-VIII. Radiation

- Effects of Radiation

PRACTICAL & VIVA VOICE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahlihemocytometer
- Neubaur's chamber
- Bone Marrow Needle

Recommended Textbook:

1. Textbook of Pathology ,Harsh Mohan,3rd edition

Reference book:

1. Harsh Mohan,3rd edition – Text book of Pathology
2. Dr. Ramddas Nayak, Publisher: Jaypee - Text book of Pathology

ENGLISH (IE)

General objectives:

At the end of the semester the students should be able to

- To improve comprehensive and writing skills in English
- To discuss about effective communication skills
- To prevent barriers in communication.

Unit I: Grammar

- Components of a sentence
- Positive and Negative statements
- Interrogative Statement
- Parts of speech in brief
- Transformation and synthesis of sentences
- Verb and Tense forms
- Voice
- Reported Speech
- Common errors and how to avoid them

Unit II. Vocabulary

- Medical Terminology
- Words often confused or misused
- Words and expression in British and American English
- Idioms and Phrases

Unit III. Oral communication

- Importance of speaking efficiently
- Voice culture
- Preparation of Speech
- Secrets of good delivery
- Audience Psychology
- Presentation Skills
- Using non-verbal communication
- Interview technique
- Skill in arguing

Unit IV. Spoken English

- The phonetic symbols
- Stress
- Intonation
- Rhythm
- Transcription
- Using dictionaries for learning to pronounce

Unit V. Written communication

(a) Art of writing

- Rules for effective writing
- Expansion of proverbs & Ideas
- Précis writing

(b) Letter writing

- Private letters & Social letters
- Business letters
- Letter to a Bank
- Letter to a Newspaper
- Letter to Application
- Curriculum Vitae (Different models)
- Placing an order

(c) Report writing

- Guidelines to prepare a good report
- Usage of impersonal language
- Preparing lab reports

(d) Note making and Note taking

- Note making and note taking strategies
- Organizing notes
- Exercise and note making / taking

(e) Comprehension

- Listening and reading comprehension
(Exercise of prescribed short answers)

Unit VI. Reading

- What is efficient and fast reading?
- Awareness of existing reading habits
- Tested techniques for improving speed
- Improving concentration and comprehension through systematic study.

Reference Books:

1. English for Competitive Examinations by R.P.Bhatnagar, Rajiel Bhargava
2. English for college and competitive exams by Dyvadatham
3. Written Communication in English by Sarah Freeman
4. Writing with a purpose by Tickoo & Sasikumar
5. English phonetics for Beginners by P.Iyadurai
7. Empowerment through verbs & idioms by Padmini devkumar
8. High School English Grammer and Composition by Wren & Martin
9. Communication techniques for your success everywhere by Muralidharan.

SEMESTER-II

| S.No: | Subject |
|--------------|-----------------------|
| 1. | Anatomy – II (UE) |
| 2. | Physiology –II (UE) |
| 3. | Biochemistry – II(UE) |
| 4 | Microbiology – II(UE) |
| 5. | Pathology – II(UE) |
| 6. | Pharmacology(UE) |
| 7. | Physics(IE) |
| 8. | Computer science (IE) |

SEMESTER II

ANATOMY – II (UE)

Objectives:

At the end of the course the student should be able to:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

a) Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

b) Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

c) Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

a) Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

b) Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

a) Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

b) Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOICE

- **Endocrine System**

- Pituitary gland
- Pineal body
- Thyroid & parathyroid gland
- Adrenal
- Pancreas
- Gonads – Ovary & Testis

- **Cardio-Vascular System**

- Heart

- **Lymphatic system**

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Sagittal section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicles
- Vas deferens
- Testis

- **Viva Voice**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinica

PHYSIOLOGY-II (UE)

Objectives:

- To develop vocabulary for appropriate terminologies to effectively communicate terms related to physiology of various body systems
- To identify and describe physiological functions of various structures involved in smooth functioning of the body.

Unit I Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -II Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -III Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition ,normal values, intrapulmonary and intra pleural pressures, surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis, Artificial Respiration.

Unit – IV Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – V Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VI Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions

PRACTICAL & VIVA VOICE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

Recommended book

- Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

- Medical physiology for under graduates by Indhu Khurana,
- Text Book of Physiology by A.K. Jain for BDS.

BIOCHEMISTRY – II (UE)

Objectives:

At the end of the semester the students should be able

- To have a knowledge about the chemistry and metabolism of proteins
- To learn about nutrition-balanced diet and malnutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenyl ketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOICE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles' Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

Text books Recommended:

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books:

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Explain general and specific mechanisms by which an infectious agent like viruses, fungi and parasites causing diseases.
- Explain interventions employed to prevent infectious diseases including infection control measures and vaccines.

Unit-I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOICE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II. Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan, Bhat, SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

UNIT-1: CARDIOVASCULAR SYSTEM

- Ischemic Heart Disease
- Myocardial Infarction-Definition, Etiopathogenesis and Morphology
- Valvular Heart Disease
- Rheumatic Heart Disease- Definition, Etiopathogenesis and Morphology
- Infective Endocarditis- Definition , Etiopathogenesis and Morphology
- Congenital Heart Diseases- Only Names
- Hypertension- Definition, causes, Morphology and Complications
- Atherosclerosis- Definition, Etiopathogenesis, Morphology and Complications

UNIT-2: RESPIRATORY SYSTEM

- Pneumonia- Definition, Etiopathogenesis and Morphology
- COPD-(Emphysema, Chronic Bronchitis, Bronchial Asthma) - Definition, Etiopathogenesis and Morphology
- Bronchiectasis- Definition, Etiopathogenesis and Morphology

UNIT-3: GASTROINTESTINAL SYSTEM

- Gastritis and Peptic ulcer disease- Definition, Etiopathogenesis, Morphology and Complications
- Tumors of GIT
- Gastric carcinoma-Etiology and Morphology

UNIT-4: HEPATOBILIARY SYSTEM

- Liver Abscess
- Amoebic liver abscess
- Alcoholic Liver Disease and Liver Cirrhosis- Definition, Etiopathogenesis , Morphology and Complications, Jaundice- Definition, Pathophysiology, Types and Causes
- Viral Hepatitis- Definition, Etiology and Morphology
- Cholecystitis

UNIT-5: RENAL AND URINARY SYSTEM

- Renal Calculus- Etiology, Types and Complications
- UTI and Pyelonephritis – Causes, Etiopathogenesis , Morphology and Complications
- Renal Cell Carcinoma- Causes and Names of Tumors
- Renal Failure
- Acute Glomerulonephritis/Nephritic syndrome and Nephrotic syndrome- Definition, Causes, Clinical Presentation and Complications

UNIT-6: REPRODUCTIVE SYSTEM

- Diseases of Testis, Uterus, Cervix, Ovary- Only Names

UNIT-7: CENTRAL NERVOUS SYSTEM

- Infection
- Meningitis- Definition, Causes and CSF Findings

UNIT-8: DISEASES OF BONES & JOINTS

- Septic Arthritis
- Osteomyelitis-Definition, Causes, Morphology and Complications
- Rheumatoid Arthritis- Definition, Etiopathogenesis and Morphology
- Bone Tumors- Only Names

UNIT-9: ANEMIA

- Anemia- Definition, Classification
- Iron deficiency and Megaloblastic Anemia- Etiology and Morphology

UNIT-10: AUTOIMMUNE DISEASES

- Definition and Names of common autoimmune diseases

PRACTICAL & VIVA VOICE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

Recommended Textbook:

1. Textbook of Pathology ,Harsh Mohan,3rd edition

Reference book:

1. Harsh Mohan,3rd edition – Text book of Pathology
2. Dr. Ramddas Nayak, Publisher: Jaypee - Text book of Pathology
Dr.Ramddas Nayak, Publisher: Jaypee – Text book of Pathology and Genetics

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

- To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.
- To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.
- To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Unit I: Introduction

- General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-
- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-

coagulation, Fibrinolytic and Antiplatelet drugs, Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy, Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

1. Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition
2. Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

1. Essentials of Medical Pharmacology by KD Tripathi, 7th edition
2. Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOICE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

- Instruments
- Needles
 - Intravenous
 - Intrathecal
 - Spinal
 - Intra arterial

- Syringes:
 - Tuberculin
 - Insulin
 - I.V cannula
 - Scalp. Vein set
- Students Discussion
 - Enema can
 - Inhalers
 - Spacers
 - Nebulizers
- Tablets –
 - Enteric coated,
 - Sustained release,
 - Sub-lingual
- Students Discussion
 - Capsules
 - Spansules
 - Pessary
 - Suppository
 - Topical Preparation
 - Ointment,
 - Lotion,
 - Powder,
 - Drops – eye / ear
- Charts:
 - Mechanism of action of drugs, adverse effects, toxicology
- Spotters:
 - drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS (IE)

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal- Photochemical application -Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Bio potential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Recommended books:

1. New Understanding physics for advanced level-JimBreithaupt.
2. Advanced Physics for you by Keith Johnson, Simmon shewett, Sueholt,Johnmiller
3. Christensen's Physics of diagnostic Radiology by Thaomas S.CurryIII, M.D., Robert C Murry, Jr. PhD., Dow Dey, PhD.
4. Applied Electronics, A. Subramanyam, The National Publishing co., Madras(1996).

Computer Science (IE)

Unit-I. History of computers,

- Definition of computers, Input devices, Output devices, Storage devices, Types of memory and units of measurement, Range of computers, Generations of computers, Characteristics of computers

Unit-II. System:

- Hardware, Software, system definition, Fundamentals of Networking, Internet, Performing searches and working with search engines, types of software and its applications

Unit-III. Office application suite

- Word processor, spreadsheet, presentations, other utility tools, Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

Unit-IV. Language

- Comparison chart of conventional language, Programming Languages, Generations Of Programming Languages, Compilers and Interpreters, Universal programming constructs based on SDLC, Variable, constant, identifiers, functions, procedures, if while, do – while, for and other Structures. Programming in C language, Data types, identifiers, functions and its types, arrays, union, structures and pointers

Unit-V. Introduction to object oriented programming with C++:

- Classes, Objects, Inheritance Polymorphism and Encapsulation. Introduction to databases, and query languages, Introduction to Bioinformatics.

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in allied health sciences

Text Books:

1. Peter Norton., Introduction to Computers. 7th Edition, Tata McGraw Hill Education Private Limited 2010.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat., Microsoft Office 2007. 1st Edition, Delmar Cengage Learning 2010

Reference Books:

1. C programming tutorial (K&R version 4) Author(s) Mark Burgess
2. Red hat Linux 9 bible by Christopher Negus May 2003

SEMESTER-III

| S.NO | SUBJECT |
|-------------|--|
| 1. | Ocular Anatomy and Ocular Physiology- (Theory) (UE) |
| 2. | Ocular Anatomy and Ocular Physiology- (Practical) (UE) |
| 3. | Geometrical Optics & Physical Optics (Theory) (UE) |
| 4. | Geometrical Optics & Physical Optics (Practical) (UE) |
| 5. | Medical Ethics& Biosafety (IE) |
| 6. | Psychology (IE) |
| 7. | Clinics - I(IE) |

SEMESTER –III

OCULAR ANATOMY& OCULAR PHYSIOLOGY -THEORY(UE)

OCULAR ANATOMY:

OBJECTIVES: At the end of the course, the student should be able to:

- Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the eye and adnexa.
- Identify the microscopic structures of various tissues in the eye and correlate the structure with the functions.
- Comprehend the basic structure and connections between the various parts of the central nervous system and the eye so as to understand the neural connections and distribution.
- To understand the basic principles of ocular embryology and the phenomenon of vision .
- List the physiological principles underlying pathogenesis and treatment of diseases of the eye, explain the normal functioning of all structures of the eye and their interactions and elucidate the physiological aspects of normal growth and development of the eye

UNIT -I

- Embryology of eye
- Histology of eye

UNIT –II

Anatomy of Eyeball – including muscle, blood and nerve supply

- Orbit
- Eyelid
- Lacrimal apparatus
- Sclera
- Conjunctiva
- Choroid
- Ciliary body
- Iris
- Retina

Refractory media

- Cornea
- Aqueous humor
- Anterior chamber
- Posterior chamber
- Lens
- Vitreous body

OCULAR PHYSIOLOGY

UNIT -III

Protective structure in the eye:

- Orbit and its functions, Eye lid physiology and lacrimal apparatus, Tear film & composition of tears, Tests to assess lacrimal excretory function
- Extrinsic eye muscles, Articulation of eyeball in socket, Mechanics of movement, Control of eye movements
- Diplopia-Diagnosis & assessment ,Measurement of Torsion, Deviation, Field of BSV and field of muscle actions
- Coats of the eye ball
- Cornea - Biochemistry, Corneal Transparency, Innervation
- Aqueous humor and vitreous humor- Intra ocular pressure: Maintenance of IOP, Diurnal variations, Measurement of IOP
- Iris and pupil
- Crystalline lens and accommodation – Amplitude of accommodation, presbyopia
- Retina – structure and functions, Wald's visual cycle.

UNIT -IV

- Visual acuity, Vernier acuity and principle of measurement, Factors affecting vision
- Visual perception – Binocular vision, stereoscopic vision, optical illusions
- Stereoscopic acuity, tests for stereopsis, Anomalies of stereopsis.
- Visual pathway- Optic nerve, chiasm & optic tract, Visual deprivation, lesions of pathway
- Scotopic and Photopic vision, Binocular vision, development, theories of fusion

UNIT -V

- Colour vision : Theories and diagnostic tests for congenital & acquired colour vision
- Introduction to electro physiology: Electro retinogram, Electro oculogram

REFERENCE BOOKS

1. LA Remington: Clinical Anatomy of the Visual System, Second edition, Elsevier Butterworth Heinemann, Missouri, USA, 2005.
2. AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006
3. RD Ravindran: Physiology of the eye, Arvind eye hospitals, Pondicherry, 2001
4. PL Kaufman, A Alm: Adler's Physiology of the eye clinical application, 10th edition, Mosby, 2002

OCULAR ANATOMY & OCULAR PHYSIOLOGY (PRACTICAL) (UE)

OCULAR ANATOMY

1. **Orbit:** Orbital structure demonstration
2. **Eye:** Cadaveric enucleation of eye

OCULAR PHYSIOLOGY

1. Lid movements
2. Tests for lacrimal secretion
3. Extraocular movements
4. Anterior segment examination – Slit lamp examination
5. Pupillary reflexes
6. Digital tonometry & Schiøtz tonometry
7. Measurement of accommodation
8. Visual acuity measurement
9. Retinoscopy
10. Ophthalmoscopy
11. Binocular vision
12. Color vision Testing

GEOMETRICAL OPTICS & PHYSICAL OPTICS- THEORY(UE)

OBJECTIVES: At the end of the course, the student should be able to:

- To equip the students with a thorough knowledge of mirrors and lenses. At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye.
- To equip the students with a thorough knowledge of properties of light. At the end of this course, students will be able to predict the distribution of light under various conditions.
- To equip the students with a thorough knowledge of mirrors and lenses. At the end of this course, students will be able to predict the basic properties of the images formed on the retina by the optics of the eye
- To predict the basic properties of the images formed on the retina by the optics of the eye

GEOMETRICAL OPTICS

UNIT - I

- Nature of light – light as electromagnetic oscillation; ideas of sinusoidal oscillations; amplitude and phase; speed of light in vacuum and other media; refractive index. Wavefronts–spherical, elliptical and plane; Curvature and vergence; rays; convergence and divergence in terms of rays and vergence; vergence at a distance
- Refractive index; its dependence on wavelength.
- Fermat's and Huygen's Principle –Derivation of laws of reflection and refraction (Snell's law) from these principles
- Plane mirrors –height of the mirror; rotation of the mirror Reflection by a spherical mirror –paraxial approximation; sign convention; derivation of vergence equation, Imaging by concave mirror, convex mirror, Reflectivity; transmissivity; Snell's Law, Refraction at a plane surface.
- Glass slab; displacement without deviation; displacement without dispersion
- Thick prisms; angle of prism; deviation produced by a prism; refractive index of the Prism, Prisms; angular dispersion; dispersive power; Abbe's number.
- Definition of crown and flint glasses; materials of high refractive index

UNIT - II

- Thin prism –definition; definition of Prism diopter; deviation produced by a thin prism; its dependence on refractive index
- Refraction by a spherical surface; sign convention; introduction to spherical aberration using image formed by a spherical surface of a distant object; sag formula, Paraxial approximation; derivation of vergence equation, Imaging by a positive powered surface and negative powered surface
- Vergence at a distance formula; effectivity of a refracting surface
- Definition of a lens as a combination of two surfaces; different types of lens shapes. Image formation by a lens by application of vergence at a distance formula; definitions of front and back vertex powers; equivalent power; first and second principal planes/points; primary and secondary focal planes/points; primary and secondary focal lengths, Newton's formula; linear magnification; angular magnification; Nodal Planes
- Thin lens as a special case of thick lens; review of sign convention ;Imaging by a thin convex lens; image properties (real/virtual; erect/inverted;magnified/minified) for various object positions
- Imaging by a thin concave lens; image properties (real/virtual; erect/inverted;magnified/minified) for various object positions.
- Prentice's Rule
- System of two thin lenses; review of front and back vertex powers and equivalent magnification formula, power, review of six cardinal points. System of more than two thin lenses; calculation of equivalent power using magnification formula

UNIT - III

- Vergence and vergence techniques revised.
- Gullstrand's schematic eyes, visual acuity, Stiles-Crawford
- Emmetropia and ametropia, Blur retinal Image, Correction of spherical ametropia, vertex distance and effective power, dioptric power of the spectacle, to calculate the dioptric power, angular magnification of spectacles in aphakia
- Thin lens model of the eye –angular magnification –spectacle and relative spectacle magnification., Aperture stops- entrance and exit pupils
- Astigmatism. - To calculate the position of the line image in a spherocylindrical lens.
- Accommodation –Accommodation formulae and calculations
- Presbyopia- Spectacle magnification, angular magnification of spectacle lens, near point, calculation of add, depth of field.
- Spatial distribution of optical information- modulation transfer functions- Spatial filtering- applications.
- Visual optics of aphakia and pseudophakia

PHYSICAL OPTICS

UNIT - IV

- Nature of light –light as electromagnetic oscillation –wave equation; ideas of sinusoidal oscillations –simple harmonic oscillation; transverse nature of oscillation; concepts of frequency, wavelength, amplitude and phase.
- Sources of light; Electromagnetic Spectrum.
- Polarized light; linearly polarized light; and circularly polarized light.
- Intensity of polarized light; Malus' Law; polarizers and analyzers; Methods of producing polarized light; Brewster's angle.
- Birefringence; ordinary and extraordinary rays.
- Relationship between amplitude and intensity.
- Coherence; interference; constructive interference, destructive interference; fringes; fringe width.
- Double slits, multiple slits, gratings.

UNIT - V

- Diffraction; diffraction by a circular aperture; Airy's disc
- Resolution of an instrument (telescope, for example); Raleigh's criterion
- Scattering; Raleigh's scattering; Tyndall effect.
- Basics of Lasers –coherence; population inversion; spontaneous emission; Einstein's theory of lasers. Fluorescence and Phosphorescence
- Radiometry; solid angle; radiometric units; photopic and scotopic luminous efficiency and efficacy curves; photometric units
- Inverse square law of photometry; Lambert's law
- Other units of light measurement; retinal illumination; Trolands

REFERENCE BOOKS

1. Tunnacliffe A. H, Hirst J. G, Optics, The association of British Dispensing Opticians, London, U.K., 1990.
2. Pedrotti L. S, Pedrotti Sr. F. L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.
3. Loshin D. S. The Geometric Optics Workbook, Butterworth-Heinemann, Boston, USA, 1991.
4. Schwartz S. H. Geometrical and Visual Optics: A Clinical Introduction, McGraw-Hill, New York, USA, 2002.
5. Subrahmanyam N, BrijLal, A text book of Optics, S. Chand Co Ltd, New Delhi, India, 2003.
6. Pedrotti L. S, Pedrotti Sr. F. L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.
7. Keating NM. P, Geometric, Physical and Visual Optics, Butterworth-Heinemann, Massachusetts, USA, 2002.

GEOMETRICAL OPTICS & PHYSICAL OPTIC(PRACTICAL)(UE)

1. Thick Prism – determination of prism angle and dispersive power; calculation of the refractive index
2. Thin Prism – measurement of deviation; calculation of the prism diopter
3. Image formation by spherical mirrors
4. Convex lens - power determination using lens gauge, power determination using distant object method; power determination using the vergence formula
5. Concave lens – in combination with a convex lens – power determination
6. Newton's rings-
 - a. Radius of curvature-refractive index of lens
 - b. Refractive index of a liquid
7. Demonstration of fluorescence and phosphorescence using crystals and paints
8. Air wedge-thickness of a wire (hair)
9. Grating-wavelength determination
10. Dispersive power of a grating
11. Grating – minimum deviation & Wavelength determination
12. Polarimeter
13. Single optic lever
14. Spectrometer – minimum deviation, Spectrometer – I-d curve, Spectrometer – I-I' curve, Spectrometer – narrow angled prism
15. Dispersive power of a prism
16. Construction of a tabletop telescope – all three types of telescopes.
17. Construction of a tabletop microscope

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

- Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

- Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

- Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

- Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

- Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tampo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

- Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

- Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning.Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

- Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

- Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

- Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality.Social Factors Influencing Personality.

UNIT 6: Social Psychology

- Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

- Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology
- Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.
- Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, **“Introduction to Psychology” – 7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), **“Social psychology”**, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, **“Social psychology” 9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. **“Health Psychology” Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, **“Psychology for Effective Living”**, Department of Psychology, University of Madras.
6. Coleman, James. 1980. **“Abnormal Psychology and modern life”**. New Delhi: Tata McGraw Hill Ltd.

CLINICS - I (IE)

A Logbook is maintained with case sheets of complete management and follow-ups:

- Role Play (Patient- Optometrist)
- Clinical Observation and Report Writing
- Vision Check (Snellen's Chart) –Distance + Near
- History taking
 - General
 - Specific
 - Conditions
- Vision Check(log MAR)
- Pinhole acuity

SEMESTER-IV

| S.NO | SUBJECT |
|-------------|--|
| 1 | Visual Optics I &II (Theory) (UE) |
| 2 | Optometric Optics I & II And Dispensing Optics (Theory) (UE) |
| 3 | Visual Optics I & II And Dispensing Optics (Practical) (UE) |
| 4 | Optometric Instruments (Theory) (UE) |
| 5 | Clinical Examination Of Visual System(IE) |
| 6 | Nutrition(IE) |
| 7 | Clinics - II(IE) |

SEMESTER - IV
VISUAL OPTICS I & II THEORY(UE)

OBJECTIVES: Upon completion of the course, the student should be able:

1. To understand the fundamentals of optical components of the eye
2. To gain theoretical knowledge and practical skill on visual acuity measurement, objective and subjective clinical refraction.
3. To concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.

VISUAL OPTICS I

UNIT -I

Review of Geometrical Optics: Vergence and power

- Conjugacy, object space and image space
- Sign convention
- Spherical refracting surface
- Spherical mirror; catoptric power
- Cardinal points
- Magnification
- Light and visual function
- Clinical Relevance of: Fluorescence, Interference, Diffraction, Polarization, Bi-refringence, Dichroism
- Aberration and application Spherical and Chromatic

UNIT -II

Optics of Ocular Structure

- Cornea and aqueous
- Crystalline lens

- Vitreous
- Schematic and reduced eye

Measurements of Optical Constants of the Eye

- Corneal curvature and thickness
- Keratometry
- Curvature of the lens and ophthalmophakometry
- Axial and axis of the eye

Basic Aspects of Vision.

- Visual Acuity
- Light and Dark Adaptation
- Color Vision
- Spatial and Temporal Resolution
- Science of Measuring visual performance and application to Clinical Optometry

UNIT –III

Refractive anomalies and their causes

- Etiology of refractive anomalies
- Contributing variability and their ranges
- Populating distributions of anomalies.
- Optical component measurements
- Growth of the eye in relation to refractive errors

VISUAL OPTICS II

UNIT -IV

Accommodation & Presbyopia

- Far and near point of accommodation
- Range and amplitude of accommodation
- Mechanism of accommodation
- Variation of accommodation with age
- Anomalies of accommodation

- Presbyopia
- Hypermetropia and accommodation

Convergence:

- Type, Measurement and Anomalies
- Relationship between accommodation and convergence-AC/A ratio

Objective Refraction (Static & Dynamic)

- Streak retinoscopy
- Principle, Procedure, Difficulties and interpretation of findings
- Transposition and spherical equivalent
- Dynamic retinoscopy various methods
- Radical retinoscopy and near retinoscopy
- Cycloplegic refraction

UNIT -V

Subjective Refraction:

- Principle and fogging
- Fixed astigmatic dial (Clock dial), Combination of fixed and rotator dial (Fan and block test), J.C.C
- Duochrome test
 - Binocular balancing- alternate occlusion, prism dissociation, dissociate Duochrome balance, Borish dissociated fogging
 - Binocular refraction- Various techniques

Effective Power & Magnification :

- Ocular refraction vs. Spectacle refraction
- Spectacle magnification vs. Relative spectacle magnification
- Axial vs. Refractive ametropia, Knapp's law
- Ocular accommodation vs. Spectacle accommodation
- Retinal image blur-Depth of focus and depth of field

REFERENCE BOOKS:

1. A H Tunnacliffe: Visual optics, The Association of British Optician, 1987
2. AG Bennett & RB Rabbets: Clinical Visual optics, 3rd edition, Butterworth Heinemann, 1998
3. M P Keating: Geometric, Physical and Visual optics, 2nd edition, Butterworth-Heinemann, USA, 2002
4. HL Rubin: Optics for clinicians, 2nd edition, Triad publishing company. Florida, 1974.
5. H Obstfeld: Optic in Vision- Foundations of visual optics & associated computations, 2nd edition, Butterworth, UK, 1982.
6. WJ Benjamin: Borish's clinical refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006
7. Theodore Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinemann, 2007
8. Duke –Elder's practice of Refraction
9. AI Lens: Optics, Retinoscopy, and Refractometry: 2nd edition, SLACK Incorporated (p) Ltd, 2006
10. George K. Hans, Kenneth Cuiffreda: Models of the visual system, Kluwer Academic, NY, 2002
11. Leonard Werner, Leonard J. Press: Clinical Pearls in Refractive Care, Butterworth – Heinemann, 2002
12. David B. Elliot: Clinical Procedures in Primary Eye care, 3rd edition, Butterworth – Heinemann, 2007
13. WJ Benjamin: Borish's clinical refraction, 2nd edition, Butterworth Heinemann, Missouri, USA, 2006

OPTOMETRIC OPTICS I & II AND DISPENSING OPTICS: THEORY(UE)

Objectives:

Skills/knowledge to be acquired at the end of this course:

- Measurement of lens power , lens centration using conventional techniques and Transposition of various types of lenses • Knowledge to identify different forms of lenses (equi- convex, planoconvex, periscopic, etc.)
- Knowledge to select the tool power for grinding process and Measurement of surface powers using lens measure ,Method of laying off the lens for glazing process and Ophthalmic prism knowledge – effects, units, base-apex notation, compounding and resolving prisms.
- Knowledge of prism and decentration in ophthalmic lenses and different types of materials used to make lenses and lens designs – single vision, bifocals, progressive lens , tinted and protective lenses, progressive lens fitting and solving of trouble shooting ,special lenses like isekonic, spectacle magnifiers , spectacle frames – manufacture, materials
- Knowledge to deal with the dispensing aspects of spectacle lenses and frames needed to manage the customer in an Optical set up, from counseling to delivering the spectacles

OPTOMETRIC OPTICS I

UNIT -I

- Introduction –Light, Mirror, Reflection, Refraction and Absorption
- Prisms –Definition, properties, Refraction through prisms, Thickness difference, Base-apex notation, uses, nomenclature and units, Sign Conventions, Fresnel’s prisms, rotary prisms
- Lenses –Definition, units, terminology used to describe, form of lenses
- Vertex distance and vertex power, Effectivity calculations
- Lens shape, size and types i.e. Spherical, cylindrical and Sphero-cylindrical
- Transpositions –Simple, Toric and Spherical equivalent
- Prismatic effect, centration, decentration and Prentice rule, Prismatic effect of Plano-cylinder and Sphero-cylinder lenses
- Spherometer & Sag formula, Edge thickness calculations

- Magnification in high plus lenses, Minification in high minus lenses
- Tilt induced power in spectacles
- Aberration in Ophthalmic Lenses

OPTOMETRIC OPTICS II

UNIT -II

Spectacle Lenses - II:

- Manufacture of glass
- Lens materials
- Lens surfacing
- Principle of surface generation and glass cements
- Terminology used in Lens workshop
- Lens properties
- Lens quality
- Faultsinlensmaterial
- Faults on lens surface
- Methods of Inspecting the quality of lenses
- Safety standards for ophthalmic lenses (FDA, ANSI, ISI, Others)

Spectacle Frames:

- Types and parts
- Classification of spectacle frames-material, weight, temple position, Coloration
- Frame construction
- Frame selection
- Size, shape, mounting and field of view of ophthalmic lenses

Tinted & Protective Lenses

UNIT -III

- Characteristics of tinted lenses Absorptive Glasses
- Polarizing Filters, Photochromic & Reflecting filters
- Safety lenses-Toughened lenses, Laminated Lenses, CR 39, Polycarbonate lenses

Multifocal Lenses:

- Introduction, history and development, types
- Bifocal lenses, Trifocal & Progressive addition lenses

Reflection from spectacle lens surface & lens coatings:

- Reflection from spectacle lenses - ghost images - Reflections in bifocals at the dividing line
- Antireflection coating, Mirror coating, Hard Multi Coating [HMC], Hydrophobic coating

Miscellaneous Spectacle:

- Iseikonic lenses
- Spectacle magnifiers
- Recumbent prisms
- Fresnel prism and lenses
- Lenticular & Aspherical lenses

High Refractive index glasses**DISPENSING OPTICS****UNIT - IV**

- Frame measurements
- Instrumentation Pupillometer, Pliers, PCD, Air blower, Distometer
- Measuring Inter-pupillary distance (IPD) for distance & near
- Lens & Frame markings, Pupillary centers, bifocal heights, Progressive markings & adjustments –facial wrap, pantoscopic tilt
- Frame types & selection –based on spectacle prescription, professional requirements, age group, face shape
- Components of spectacle prescription & interpretation, transposition, Add and near power relation
- Recording and ordering of lenses (power, add, diameter, base, material, type, lens enhancements)
- Neutralization –Hand & lensometer, axis marking, prism marking
- Faults in spectacles (lens fitting, frame fitting, patients complaints, description, detection and correction)

UNIT -V

- Final checking & dispensing of spectacles to customers, counseling on wearing & maintaining of spectacles.
- Accessories –Bands, chains, boxes, sleeves, cleaners,
- screwdriver kit
- Spectacle repairs –tools, methods, soldering, riveting, frame adjustments
- Special purpose frames
- Safety Eye wear
- Frame availability in Indian market
- FAQ's by customers and their ideal answers.

REFERENCE BOOKS:

1. Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1994.
2. David Wilson: Practical Optical Dispensing, OTEN- DE, NSW TAFE Commission, 1999
3. C V Brooks, IM Borish: System for Ophthalmic Dispensing, Second edition, Butterworth-Heinemann, USA, 1996
4. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth –Heinemann, 2008
5. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth –Heinemann, 1996
6. C W Brooks, IM Borish: System for Ophthalmic Dispensing, 3rd edition, Butterworth -Heinemann, 2007
7. Michael P Keating: Geometric, Physical & Visual Optics, 2nd edition, Butterworth –Heinemann, 2002

VISUAL OPTICS I& II AND DISPENSING OPTICS PRACTICAL-(UE)

VISUAL OPTICS –I & II

- Study of Purkinje images I and II
- Measurement of corneal curvature
- Mathematical models of the eye –emmetropia
- Mathematical models of Hypermetropia
- Mathematical models of myopia
- Conjugate points – demonstration – worked examples
- Axial and refractive hyperopia – worked examples
- Axial and refractive myopia – worked examples
- Visual acuity Measurement
- Effect of lenses in front of the eye
- Effect of prisms in front of the eye
- Vision through pinhole, slit, filters, etc
- Visual acuity, stereo acuity in emmetropic
- Presbyopic correction and methods: accommodative reserve, balancing the relative accommodation and cross grid test
- Methods of differentiating axial and refractive ametropia
- Practice of Retinoscopy – Emmetropia
- Practice of Retinoscopy – Spherical ametropia
- Practice of Retinoscopy – Simple astigmatism
- Practice of Retinoscopy – Compound hyperopia
- Practice of Retinoscopy – Compound myopia
- Practice of Retinoscopy – Oblique astigmatism
- Practice of Retinoscopy – in media opacities
- Practice of Retinoscopy -Aphakic
- Practice of Retinoscopy – in irregular astigmatism
- Practice of Retinoscopy – in strabismus and eccentric fixation
- Interpretation of cycloplegicretinoscopic findings
- Measurement of accommodation- near and far points and range
- Measurement of Convergence
- Prescription writing
- Vision therapy

DISPENSING OPTICS

- Optic center marking
- PD Measurement – for far and near
- Pupillometer
- Tints and filters to be shown – indications
- Different types of Bifocals to be shown
- PALs fitting

OPTOMETRIC INSTRUMENTS- THEORY(UE)

OBJECTIVES:

Upon completion of the course, the student should be able to gain theoretical knowledge and basic practical skill in handling the following instruments

- Visual Acuity chart/drum,Retinoscope,Trail Box,Jackson Cross cylinder,Direct ophthalmoscope .Slit lamp Biomicroscope and Ophthalmoscopy (+90, 78 D)
- Gonioscope,Tonometer: Applanation Tonometer and Keratometer
- Perimeter,Electrodiagnostic instrument (ERG, VEP, EOG),A –Scan Ultrasound and Lensometer

UNIT -I

Refractive instruments

- Visual acuity measurement-standard test chart includes CSM, Lea Paddles, Pediatric charts, Snellen and Logarithmic charts
- Trial case lenses and Trial frame- types available
- Refractor (phoropter)
- Retinoscope – types available

UNIT -II

- Brightness acuity test
- Vision analyzer
- Pupilometer
- Potential Acuity Meter

UNIT -III

Ophthalmoscopes and related devices

- Direct and Indirect Ophthalmoscope
- Design of ophthalmoscopes – illumination, viewing

Nerve Fiber Analyser

- OCT

UNIT –IV

- Lensometry
- Slit lamp Biomicroscopy
- Tonometry
- Placido's disc
- Keratometry
- Corneal topography

UNIT -V

- Orthoptic Instruments-Synaptophore , Home therapy systems
- Color Vision Testing Devices
- Fields of Vision And Screening Devices
- Fundus camera
- Ophthalmic Ultrasonography and Imaging –A-scan, B-scan, Optical Coherence Tomography
- Electro diagnostics - Electroretinogram(ERG), Electrooculogram(EOG), Visual evoked potentials(VEP)

REFERENCE BOOKS:

1. David Henson: Optometric Instrumentations, Butterworth- Heinemann, UK, 1991
2. P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002
3. G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

CLINICAL EXAMINATION OF THE VISUAL SYSTEM THEORY(IE)

OBJECTIVES:

- At the end of the course the students will be skilled in knowing the purpose, set- up and devices required for the test, indications and contraindications of the test, step-by-step procedures, documentation of the findings
- Interpretation of the findings of the various clinical optometry procedure
- This course covers various clinical optometry procedures involving external examination, anterior segment and posterior segment examination, neuroophthalmic examination, paediatric optometry examination, and Glaucoma evaluation
- This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.

UNIT -I

- History taking
- Visual acuity estimation
- Extraocular motility, Cover test, Alternating cover test
- Hirschberg test, Modified Krimsky
- Pupils Examination
- Maddox Rod

UNIT -II

- Van Herrick Grading
- External examination of the eye, Lid Eversion
- Schirmer's, TBUT, tear meniscus level, NITBUT (keratometer),
- Color Vision
- Stereopsis

UNIT -III

- Confrontation test
- Photostress test
- Slit lamp biomicroscopy
- Ophthalmoscopy

UNIT -IV

- Tonometry
- ROPLAS
- Amsler test
- Contrast sensitivity function test
- Saccades and pursuit test

TEXT BOOK:

1. T Grosvenor: Primary Care Optometry, 5th edition, Butterworth –Heinneman, USA, 2007

NUTRITION-THEORY (IE)

OBJECTIVES:

At the end of the course student would have gained the knowledge of the following:

- To diagnose various nutritional deficiencies
- Provide health education base on the client deficiencies
- Identify condition and plan for Balanced diet.
- Protein, carbohydrates, vitamins, Minerals, carotenoids and eye.
- Nutrition and Ocular aging and Adverse effects of ocular nutritional supplements.

UNIT-I

Introduction.

- History of Nutrition
- Nutrition as a science
- Food groups, RDA
- Balanced diet, diet planning.
- Assessment of nutritional status

UNIT-II

Energy

- Units of energy.
- Measurements of energy and value of food
- Energy expenditure.
- Total energy/calorie requirement for different age groups and diseases.
- Satiety value
- Energy imbalance- obesity, starvation.
- Limitations of the daily food guide.

UNIT-III

Proteins

- Sources and functions
- Essential and non- essential amino- acids.
- Incomplete and complete proteins
- Supplementary foods.
- PEM and the eye
- Nitrogen balance
- Changes in protein requirement.

UNIT-IV

Fats

- Sources and functions
- Essential fatty acids
- Excess and deficiency
- Lipids and the eye.
- Hyperlipidemia, heart diseases, atherosclerosis

Minerals

- General functions and sources
- Macro and micro minerals associated with the eye.
- Deficiencies and excess –ophthalmic complications (e.g. iron, calcium, iodine etc.)

UNIT-V

Vitamins

- General functions, and food sources
- Vitamin deficiencies and associated eye disorders with particular emphasis to Vitamin A
- Promoting sound habits in pregnancy, lactation and infancy.
- Nutrient with antioxidant.
- Properties
- Digestion of Proteins, carbohydrates & lipids

Essential amino acids.

Miscellaneous

- Measles and associated eye disorders, low birthweight

TEXT BOOK:

1. M Swaminathan: Hand book of Food and Nutrition, fifth edition, Bangalore printing & publishing Co.Ltd, Bangalore, 2004
2. C Gopalan, BV Rama Sastri, SC Balasubramanian: Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad, 2004
3. Frank Eperjesi & Stephen Beatty: Nutrition and the Eye A practical Approach, Elsevier Butterworth- Heinemann, USA, 2006

CLINICS - II (IE)

A Logbook is maintained with case sheets of complete management and follow-ups:

1. Extraocular Motility
2. Cover test
3. Alternate Cover test
4. Hirschberg test
5. Modified Krimsky test
6. Push up test (Amplitude of Accommodation)
7. Push up test (Near point of Convergence)
8. Negative Relative Accommodation
9. Positive Relative Accommodation
10. Maddox rod (Phoria)
11. Negative Fusional vergence
12. Positive Fusional Vergence
13. Stereopsis test
14. Tear Break up time
15. Amsler's Grid test
16. Photostress test
17. Color vision test
18. Schirmer's test
19. Confrontation test
20. Lensometry

SEMESTER-V

| S.NO | SUBJECT |
|-------------|--|
| 1 | Ocular Diseases - I (Theory) (UE) |
| 2 | Ocular Diseases- II & Glaucoma (Theory) (UE) |
| 3 | Low Vision And Contact Lens (Theory) (UE) |
| 4 | Low Vision And Contact Lens (Practical) (UE) |
| 5 | Systemic Diseases (IE) |
| 6 | Special Clinics – I (IE) |

SEMESTER –V
OCULAR DISEASES I THEORY(UE)

OBJECTIVES:

At the end of the course the students will be knowledgeable in the following aspects of ocular diseases:

- knowledge on the etiology, epidemiology, symptoms, signs, course sequelae of ocular disease
- knowledge on the diagnostic approach, and management of the ocular diseases

UNIT -I

Orbit

- Applied Anatomy
- Proptosis (Classification, Causes, Investigations)
- Enophthalmos
- Developmental Anomalies (craniosynostosis, Craniofacial Dysostosis, Hypertelorism, Median facial cleft syndrome)
- Orbital Inflammations (Preseptal cellulites, Orbital cellulitis Orbital Periostitis, cavernous sinus Thrombosis)
- Grave's Ophthalmopathy
- Orbital tumors(Dermoids, capillary haemangioma, Optic nerve glioma)
- Orbital blowout fractures
- Orbital surgery (Orbitotomy)
- Orbital tumors
- Orbital trauma
- Approach to a patient with proptosis

UNIT -III

Lids

- Applied Anatomy
- Congenital anomalies (Ptosis, Coloboma, Epicanthus, Distichiasis, Cryptophthalmos)

- Oedema of the eyelids(Inflammatory, Solid, Passive edema)
- Inflammatory disorders (Blepharitis, External Hordeolum, Chalazion, Internalhordeolum, Mollusum Contagiosum)
- Anomalies in the position of the lashes and Lid Margin (Trichiasis, Ectropion, Entropion, Symblepharon, Blepharophimosis, Lagophthalmos, Blepharospasm, Ptosis).
- Tumors (Papillomas, Xanthelasma, Haemangioma, Basal carcinoma, Squamous cell carcinoma, sebaceous gland melanoma)

Lacrimal System

- Applied Anatomy
- Tear Film
- The Dry Eye (Sjogren's Syndrome)
- The watering eye (Etiology, clinical evaluation)
- Dacryocystitis
- Swelling of the Lacrimal gland(Dacryoadenitis)

UNIT -IV

Conjunctiva

- Applied Anatomy
- Inflammations of conjunctiva (Infective conjunctivitis – bacterial, chlamydial, viral , Allergic conjunctivitis, Granulomatous conjunctivitis)
- Degenerative conditions(Pinguecula, Pterygium, Concretions)
- Symptomatic conditions(Hyperaemia, Chemosis, Ecchymosis, Xerosis, Discoloration)
- Cysts and Tumors

Cornea

- Applied Anatomy and Physiology
- Congenital Anomalies (Megalocornea, Microcornea, Cornea plana, Congenital cloudy cornea)
- Inflammations of the cornea (Topographical classifications: Ulcerative keratitis and Non ulcerative

- Etiological classifications: Infective, Allergic, Trophic, Traumatic, Idiopathic))
- Degenerations (classifications, Arcussenilis, Vogt's white limbal girdle, Hassal-henle bodies, Lipoid Keratopathy, Band shaped keratopathy, Salzmann's nodular degeneration, Droplet keratopathy, Pellucid Marginal degeneration)
- Dystrophies (Reis Buckler dystrophy, Recurrent corneal erosion syndrome, Granular dystrophy, Lattice dystrophy, Macular dystrophy, cornea guttata, Fuch's epithelial endothelial dystrophy, Congenital hereditary endothelial dystrophy)
- Keratoconus, Keratoglobus
- Corneal oedema, Corneal opacity, Corneal vascularisation
- Penetrating Keratoplasty

UNIT -V

Uveal Tract and Sclera

- Applied Anatomy,
- Classification of uveitis
- Etiology
- Pathology
- Anterior Uveitis
- Posterior Uveitis
- Purulent Uveitis
- Endophthalmitis
- Panophthalmitis
- Pars Planitis
- Tumors of uveal tract(Melanoma)
- Episcleritis and scleritis
- Clinical examination of Uveitis and Scleritis

REFERENCE BOOKS:

1. A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international
2. Ltd. Publishers, New Delhi, 2007\Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth - Heinemann, 2007

OCULAR DISEASES- II & GLAUCOMA **(THEORY)**

OBJECTIVES:

At the end of the course the students will be knowledgeable in the following aspects of ocular diseases:

- knowledge on the etiology, epidemiology, symptoms, signs, course sequelae of ocular disease
- knowledge on the diagnostic approach, and management of the ocular diseases and glaucoma

UNIT -I

Retina and Vitreous:

- Applied Anatomy
- Congenital and Developmental Disorders (Optic Disc: Coloboma, Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery)
- Inflammatory disorders (Retinitis : Acute purulent , Bacterial, Virus, mycotic)
- Retinal Vasculitis (Eales's)
- Retinal Artery Occlusion (Central retinal Artery occlusion)
- Retinal Vein occlusion (Ischaemic, Non Ischaemic , Branch retinal vein occlusion)
- Retinal degenerations : Retinitis Pigmentosa, Lattice degenerations
- Macular disorders: Solar retinopathy, central serous retinopathy, cystoid macular edema, Age related macular degeneration.
- Retinal Detachment: Rhegmatogenous, Tractional, Exudative)
- Retinoblastoma
- Diabetic retinopathy

UNIT -II

Ocular Injuries:

- Terminology : Closed globe injury (contusion, lamellar laceration) Open globe injury (rupture, laceration, penetrating injury, perforating injury)
- Mechanical injuries (Extraocular foreign body, blunt trauma, perforating injury, sympathetic ophthalmitis)
- Non Mechanical Injuries (Chemical injuries, Thermal, Electrical, Radiational)
- Clinical approach towards ocular injury patients

UNIT -III

Lens

- Applied Anatomy and Physiology
- Clinical examination
- Classification of cataract
- Congenital and Developmental cataract
- Acquired (Senile, Traumatic, Complicated, Metabolic, Electric, Radiational, Toxic)
- Morphological: Capsular, Subcapsular, Cortical, Supranuclear, Nuclear, Polar.
- Management of cataract (Non-surgical and surgical measures; preoperative evaluation, Types of surgeries,)
- Complications of cataract surgery
- Displacement of lens: Subluxation, Displacement
- Lens coloboma, Lenticonus, Microsperophakia.

UNIT -IV

- Anatomy of visual pathway
- Lesions of the visual pathway
- Pupillary reflexes and abnormalities (Amaurotic light reflex, Efferent pathway defect, Wernicke's hemianopic pupil, Marcus gunn pupil. Argyll Robertson pupil, Adie's tonic pupil)
- Optic neuritis, Anterior Ischemic optic neuropathy, Pappilloedema, optic atrophy
- Cortical blindness
- Malingering
- Nystagmus
- Clinical examination

UNIT -V

Glaucoma

- Applied anatomy and physiology of anterior segment
- Clinical Examination
- Definitions and classification of glaucoma

- Pathogenesis of glaucomatous ocular damage
- Congenital glaucoma's
- Primary open angle glaucoma
- Ocular hypertension
- Normal Tension Glaucoma
- Primary angle closure glaucoma (Primary angle closure suspect, Intermittent glaucoma, acute congestive, chronic angle closure)
- Secondary Glaucoma's

Management : common medications, laser intervention and surgical technique

REFERENCE BOOKS:

1. A K Khurana: Comprehensive Ophthalmology, 4th edition, New age international Ltd. Publishers, New Delhi, 2007
2. Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990
3. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth-Heinemann, 2007

LOW VISION & CONTACT LENS -THEORY(UE)

COURSE OBJECTIVES: At the end of the course, the student will be knowledgeable in the following:

- To understand definition of low vision, epidemiology aspect of visual impairment, And about types of low vision devices and its optical principles and magnification calculation.
- To enable students, understand the clinical approach of the low vision patients and teach students about assistive devices for totally visually challenged,
- To enable students, understand art of prescribing low vision devices and training the low vision patients and other rehabilitation and to understand appropriate referral and follow-up
- The subject provides the student with suitable knowledge both in theoretical and practical aspects of Contact Lenses and to make students understand the basics of contact lenses.
- To teach about different types of CL design for various kinds of patients , demonstrate various types of fitting , how to identify and manage the adverse effects of contact lens and explain all the procedures to patient

LOW VISION

UNIT –I

- Definitions & classification of Low vision
- Epidemiology of low vision
- Model of low vision service
- Pre-clinical evaluation of low vision patients – prognostic & psychological factors; psycho- social impact of low vision
- Types of low vision aids – optical aids, non-optical aids & electronic devices
- Optics of low vision aids

UNIT –II

- Clinical evaluation – assessment of visual acuity, visual field, selection of low vision aids, instruction & training
- Pediatric Low Vision care
- Low vision aids – dispensing & prescribing aspects
- Visual rehabilitation & counseling
- Legal aspects of Low vision in India
- Case Analysis

TEXT BOOKS:

1. Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth-Heinemann, 1998
2. Sarika G, Sailaja MVSE Vaithilingam: practice of Low vision –A guide book, Medical Research Foundation, 2015.

CONTACT LENS

UNIT –III

- Introduction to Contact lenses
 - Definition
 - Classification / Types
- History of Contact Lenses
- Optics of Contact Lenses
 - Magnification & Visual field
 - Accommodation & Convergence
 - Back & Front Vertex Power / Vertex distance calculation
- Review of Anatomy & Physiology of
 - Tear film
 - Cornea
 - Lids & Conjunctiva
- Introduction to CL materials
 - Monomers, Polymers
 - Properties of CL materials
 - Physiological (Dk, Ionicity, Water content)
 - Physical (Elasticity, Tensile strength, Rigidity)
 - Optical (Transmission, Refractive index)

UNIT –IV

- Indications and contraindications
- Parameters / Designs of Contact Lenses & Terminology
- RGP Contact Lens materials
- Manufacturing Rigid and Soft Contact Lenses – various methods
- Pre-Fitting examination – steps, significance, recording of results
- Correction of Astigmatism with RGP lens
- Types of fit – Steep, Flat, Optimum – on spherical cornea with spherical lenses
- Types of fit – Steep, Flat, Optimum – on Toric cornea with spherical lenses

UNIT –V

- Calculation and finalising Contact lens parameters
- Ordering Rigid Contact Lenses – writing a prescription to the Laboratory
- Checking and verifying Contact lenses from Laboratory
- Modifications possible with Rigid lenses
- Common Handling Instructions
 - Insertion & Removal Techniques
 - Do's and Don't's
- Care and Maintenance of Rigid lenses
 - Cleaning agents & Importance
 - Rinsing agents & Importance
 - Disinfecting agents & importance
 - Lubricating & Enzymatic cleaners
- Follow up visit examination
- Complications of RGP lenses

UNIT –VI

- SCL Materials & Review of manufacturing techniques
- Comparison of RGP vs. SCL
- Pre-fitting considerations for SCL

- Fitting philosophies for SCL
- Fit assessment in Soft Contact Lenses: Types of fit – Steep, Flat, Optimum
- Calculation and finalising SCL parameters
 - Disposable lenses
 - Advantages and availability
- Soft Toric CL
 - Stabilization techniques
 - Parameter selection
 - Fitting assessment
- Common Handling Instructions
 - Insertion & Removal Techniques
 - Do's and Dont's
- Care and Maintenance of Soft lenses
 - Cleaning agents & Importance
 - Rinsing agents & Importance
 - Disinfecting agents & importance
 - Lubricating & Enzymatic cleaners
 - Follow up visit examination, Complications of Soft lenses
- Therapeutic contact lenses
 - Indications
 - Fitting consideration
- Specialty fitting
 - Aphakia
 - Pediatric
 - Post refractive surgery
- Management of Presbyopia with Contact lenses

TEXT BOOKS:

1. IACLE modules 1 - 10
2. CLAO Volumes 1, 2, 3
3. Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006
4. Elisabeth A. W. Millis: Medical Contact Lens Practice, Butterworth-Heinemann, 2004
5. E S. Bennett , V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williams and Wilkins, 2008

LOW VISION AND CONTACT LENS (PRACTICAL) (UE)

LOW VISION

1. Practical 1: Attending in low vision care clinic: History taking, Refraction and other supportive tests
2. Practical 2:
 - 2.1 Demonstration of Optical, non-optical & electronic devices
 - 2.2 Determining the type of telescope and its magnification (Direct comparison method & calculated method)
 - 2.3 Determining the change in field of view with different magnification and different eye to lens distances with telescopes and magnifiers.
3. Practical 3:
 - 3.1 Inducing visual impairment and prescribing magnification.
 - 3.2 Determining reading speed with different types of low vision aids with same magnification.
 - 3.3 Determining reading speed with a low vision aid of different magnifications.

CONTACT LENS :

1. History taking
2. Measurement of Ocular dimensions
3. Pupillary diameter and lid characteristics
4. Blink rate and TBUT
5. Schrimers test, Slit lamp examination of tear layer
6. Keratometry and Placido's disc
7. Specular microscopy & Pachymetry
8. Soft Contact Lens fitting
9. RGP Lens fitting
10. RGP Lens Fit Assessment and fluorescein pattern
11. Specialty Contact Lens fitting – Aphakia, Pediatric, Keratoconus
12. Bandage Contact lens
13. Slit lamp examination of Contact Lens wearers
14. Lens insertion and removal
15. Lens handling and cleaning
16. Examination of old soft and RGP Lenses

SYSTEMIC DISEASES THEORY(IE)

COURSE OBJECTIVES:

At the end of the course, students should get acquainted with the following:

- To have an understanding of various systemic diseases that all affect the eyes
- To have an understanding of the ocular side effects of various drugs that are used to manage or treat systemic diseases
- To understand the role of an optometrists for co management of and systemic diseases with other health care profession
- Common Systemic conditions: Definition, diagnostic approach, complications and management options
- Ocular findings of the systemic conditions and First Aid knowledge

UNIT –I

Hypertension

- Definition, classification, Epidemiology, clinical examination, complications, and management.
- Hypertensive retinopathy

Diabetes Mellitus

- Classification, pathophysiology, clinical presentations, diagnosis, and management, Complications
- Diabetic Retinopathy

Thyroid Disease

- Physiology, testing forthyroiddisease, Hyperthyroidism, Hypothroidism, Thyroiditis, Thyroid tumors
- Grave's Ophthalmopathy

UNIT –II

Acquired Heart Disease

- Ischemic Heart Disease, Congestive heart failure, Disorders of cardiac rhythm
- Ophthalmic considerations

Cancer :

- Incidence
- Etiology
- Therapy
- Ophthalmologic considerations

UNIT –III

Connective Tissue Disease

- Rheumatic arthritis
- Systemic lupus erythematosus
- Scleroderma
- Polymyositis and dermatomyositis
- Sjogren syndrome
- Behcet's syndrome
- Eye and connective tissue disease

Tuberculosis

- Aetiology, pathology, clinical features, pulmonary tuberculosis, diagnosis, complications, treatment tuberculosis and the eye.

Herpes virus (Herepes simplex, Varicella Zoster, Cytomegalovirus, Epstein Barr Virus)

- Herpes and the eye

Hepatitis (Hepatitis A, B, C)

Acquired Immunodeficiency Syndrome

Anemia (Diagnosis, clinical evaluation, consequences, Sickle cell disease, treatment, Ophthalmologic considerations)

UNIT –IV

Common Tropical Medical Ailments

- Malaria
- Typhoid
- Dengue
- Filariases
- Onchocerciasis
- Cysticercosis
- Leprosy

Nutritional and Metabolic disorders:

- Obesity
- Hyperlipidaemias
- Kwashiorkor
- Vitamin A Deficiency
- Vitamin D Deficiency
- Vitamin E Deficiency
- Vitamin K Deficiency
- Vitamin B1,B2, Deficiency
- Vitamin C Deficiency

UNIT –V**Myasthenia Gravis****First Aid**

- General Medical Emergencies
- Preoperative precautions in ocular surgeries

Psychiatry

- Basic knowledge of psychiatric condition and Patient Management

Genetics

- Introduction to genetics
- Organisation of the cell
- Chromosome structure and cell division
- Gene structure and basic principles of Genetics.
- Genetic disorders and their diagnosis.
- Genes and the eye
- Genetic counseling and genetic engineering.

TEXT BOOKS:

1. C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles and Practice of Medicine, Ed. John Macleod, 19th Ed., ELBS/Churchill Livingstone. (PPM), 2002
2. Basic and clinical Science course: Update on General Medicine, American Academy of Ophthalmology, Section 1, 1999

SPECIAL CLINICS - I (IE)

A Logbook is maintained with case sheets of complete management and follow-ups:

1. Slit lamp examination
2. Finger tension
3. Schiötz Tonometry
4. Applanation Tonometry
5. Von Herick Grading of Anterior chamber depth
6. Accommodative facility(± 2.00 D)
7. Corneal Sensitivity test
8. IPD
9. Proptosis evaluation
10. Ptosis evaluation
11. Pupillary evaluation
 - Direct
 - Consensual
 - RAPD
12. HVID
13. Retinoscopy- Static, Dynamic and Cycloplegic Retinoscopy
14. Keratometry
15. Subjective Refraction
16. JCC
17. Clock Dial
18. Duochrome
19. Borish Delayed
20. Addition calculation

SEMESTER - VI

| S.NO | SUBJECT |
|-------------|---|
| 1 | Occupational Optometry & Public Health And Community Optometry- Theory (UE) |
| 2 | Geriatric Optometry & Paediatric Optometry - Theory (UE) |
| 3 | Binocular Vision I & II- Theory (UE) |
| 4 | Binocular Vision I & II – Practical (UE) |
| 5 | Sports Vision (IE) |
| 6 | Special Clinics – II (IE) |

SEMESTER – VI

OCCUPATIONAL OPTOMETRY&

PUBLIC HEALTH AND COMMUNITY OPTOMETRY –THEORY(UE)

OBJECTIVES:

At the end of the course, students should get acquainted with the following:

- To enable students, understand general aspects of occupational health.
- To teach visual demand in various job, task analyzing method, visual standards for various jobs.
- To enable them understand various occupational hazards and remedial aspects through classroom sessions and field visit to the factories.
- Knowledge in Community based eye care in India and Prevalence of various eye diseases
- Developing Information Education Communication materials on eye and vision care for the benefit of the public ,organize health education programmes in the community and Vision screening for various eye diseases in the community and for different age groups.

OCCUPATIONAL OPTOMETRY

UNIT –I

- Introduction to Occupational health, hygiene and safety, international bodies like ILO, WHO, National bodies etc.
 - Acts and Rules - Factories Act, WCA, ESI Act.
- Electromagnetic Radiation and its effects on Eye
- Light – Definitions and units, Sources, advantages and disadvantages, standards
- Color – Definition, Color theory, Color coding, Color defects, Color Vision tests
- Occupational hazards and preventive/protective methods

UNIT –II

- Task Analysis
- Industrial Vision Screening – Modified clinical method and Industrial Vision test
- Vision Standards – Railways, Roadways, Airlines
- Visual Display Units
- Contact lens and work

PUBLIC HEALTH AND COMMUNITY OPTOMETRY -THEORY(UE)

UNIT –III

- Public Health Optometry: Concepts and implementation, Stages of diseases
- Dimensions, determinants and indicators of health
- Levels of disease prevention and levels of health care patterns
- Epidemiology of blindness – Defining blindness and visual impairment
- Eye in primary health care
- Contrasting between Clinical and community health programs
- Community Eye Care Programs

UNIT –IV

- Community based rehabilitation programs
- Nutritional Blindness with reference to Vitamin A deficiency
- Vision 2020: The Right to Sight
- Screening for eye diseases
- National and International health agencies, NPCB
- Role of an optometrist in Public Health

UNIT –V

- Organization and Management of Eye Care Programs – Service Delivery models
- Health manpower and planning & Health Economics
- Evaluation and assessment of health programmes
- Optometrists role in school eye health programmes
- Basics of Tele Optometry and its application in Public Health
- Information, Education and Communication for Eye Care programs

REFERENCE BOOKS:

1. GVS Murthy, S K Gupta, D Bachani: The principles and practice of community Ophthalmology, National programme for control of blindness, New Delhi, 2002
2. Newcomb RD, Jolley JL : Public Health and Community Optometry, Charles C Thomas Publisher, Illinois, 1980
3. K Park: Park's Text Book of Preventive and Social Medicine, 19th edition,
4. Banarsidas Bhanot publishers, Jabalpur, 2007
5. MC Gupta, Mahajan BK, Murthy GVS, 3rd edition. Text Book of Community Medicine, Jaypee Brothers, New Delhi, 2002

GERIATRIC OPTOMETRY & PAEDIATRIC OPTOMETRY- **THEORY(UE)**

COURSE OBJECTIVES:

Upon completion of the course, the student should be able:

- To practice skills in pediatric and geriatric optometric assessments and develop effective clinical management
- To develop clinical competence in analysis, evaluation and management of pediatric and geriatric population.
- To meet the challenge of pediatric and geriatric eye care and vision• rehabilitation through clinical placement.

GERIATRIC OPTOMETRY:

UNIT –I

- Structural , and morphological changes of eye in elderly
- Physiological changes in eye in the course of aging.
- Introduction to geriatric medicine – epidemiology , need for optometry care, systemic diseases (Hypertension, Atherosclerosis, coronary heart disease, congestive Heart failure, Cerebrovascular disease, Diabetes, COPD)

UNIT –II

- Optometric Examination of the Older Adult
- Ocular diseases common in old eye, with special reference to cataract, glaucoma, macular disorders, vascular diseases of the eye
- Contact lenses in elderly
- Pharmacological aspects of aging
- Low vision causes, management and rehabilitation in geriatrics.
- Spectacle dispensing in elderly – Considerations of spectacle lenses and frames

PEDIATRIC OPTOMETRY:

UNIT –III

- The Development of Eye and Vision
- History taking Paediatric subjects
- Assessment of visual acuity
- Normal appearance, pathology and structural anomalies of
 - Orbit, Eye lids, Lacrimal system,
 - Conjunctiva, Cornea, Sclera Anterior chamber, Uveal tract, Pupil
 - Lens, vitreous, Fundus Oculomotor system

UNIT –IV

- Refractive Examination
- Determining binocular status
- Determining sensory motor adaptability
- Compensatory treatment and remedial therapy for : Myopia, Pseudomyopia, Hyperopia, Astigmatism, Anisometropia, Amblyopia

UNIT –V

- Remedial and Compensatory treatment of Strabismus and Nystagmus
- Paediatric eye disorders : Cataract, Retinopathy of Prematurity, Retinoblastoma, Neuromuscular conditions (myotonic dystrophy, mitochondrial cytopathy), and Genetics
- Anterior segment dysgenesis, Aniridia, Microphthalmos, Coloboma, Albinism
- Spectacle dispensing for children
- Paediatric contact lenses
- Low vision assessment in children

REFERENCE BOOKS:

1. Pediatric Optometry - JEROME ROSNER, Butterworth, London 1982
2. Paediatric Optometry –William Harvey/ Bernard Gilmartin, Butterworth –Heinemann, 2004
3. A.J.ROSSENBLOOM Jr & M.W.MORGAN: Vision and Aging, Butterworth-Heinemann, Missouri, 2007.
4. OP Sharma: Geriatric Care –A textbook of geriatrics and Gerontology, viva books, New Delhi, 2005
5. VS Natarajan: An update on Geriatrics, Sakthi Pathipagam, Chennai, 1998
6. DE Rosenblatt, VS Natarajan: Primer on geriatric Care A clinical approach to the older patient, Printers Castle, Cochin, 2002

BINOCULAR VISION I&II THEORY(UE)

OBJECTIVES:

- This course provides theoretical aspects of Binocular Vision and its clinical application.. It deals with basis of normal binocular vision and space perception, Gross anatomy and physiology of extraocular muscles.
- To teach various binocular vision anomalies, its diagnostic approach and management.
- To enable students, understand classification of strabismus, its etiology signs and symptoms, necessary Orthoptic investigations, diagnosis and non-surgical management.
- To inculcate the knowledge of different types of strabismus its etiology signs and symptoms, necessary investigations and also management.
- To perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.

UNIT –I

Binocular Vision and Space perception.

- Relative subjective visual direction.
- Retino motor value
- Grades of BSV
- SMP and Cyclopean Eye
- Correspondence,
- Fusion, Diplopia, Retinal rivalry
- Horopter
- Physiological Diplopia and Suppression
- Stereopsis, Panum's area, BSV.
- Stereopsis and monocular clues - significance.
- Egocentric location, clinical applications.
- Theories of Binocular vision.

UNIT –II

Anatomy of Extra Ocular Muscles.

- Recti and Obliques, LPS.
- Innervation & Blood Supply.

Physiology of Ocular movements.

- Center of rotation, Axes of Fick.
- Action of individual muscle.

Laws of ocular motility

- Donder's and Listing's law
- Sherrington's law
- Hering's law

Unocular & Binocular movements - fixation, saccadic & pursuits.

- Version & Vergence.
- Fixation & field of fixation

Near Vision Complex Accommodation

- Definition and mechanism (process).
- Methods of measurement.
- Stimulus and innervation.
- Types of accommodation.
- Anomalies of accommodation – aetiology and management.

UNIT –III

Convergence

- Definition and mechanism.
- Methods of measurement.
- Types and components of convergence - Tonic, accommodative, fusional, proximal.
- Anomalies of Convergence – aetiology and management.

Sensory adaptations

- Confusion

Suppression

- Investigations
- Management
- Blind spot syndrome

Abnormal Retinal Correspondence

- Investigation and management
- Blind spot syndrome

Eccentric Fixation

- Investigation and management

Amblyopia

- Classification
- Aetiology
- Investigation
- Management

BINOCULAR VISION- II

UNIT –IV

- Neuro-muscular anomalies
 - Classification and etiological factors
- History – recording and significance.
- Convergent strabismus
 - Accommodative convergent squint
 - Classification
 - Investigation and Management
 - Non accommodative Convergent squint
 - Classification
 - Investigation and Management
- Divergent Strabismus
 - Classification
 - A& V phenomenon
 - Investigation and Management
 - Vertical strabismus
 - Classification
 - Investigation and Management
- Paralytic Strabismus
 - Acquired and Congenital
 - Clinical Characteristics

UNIT –V

- Distinction from comitant and restrictive Squint
- Investigations
 - History and symptoms
 - Head Posture
 - Diplopia Charting
 - Hess chart
 - PBCT
 - Nine directions
 - Binocular field of vision
- Amblyopia and Treatment of Amblyopia
- Nystagmus
- Non-surgical Management of Squint
- Restrictive Strabismus
 - Features
 - Musculo-fascical anomalies
 - Duane's Retraction syndrome
 - Clinical features and management
 - Brown's Superior oblique sheath syndrome
 - Strabismus fixus
- Surgical management

TEXT BOOKS:

1. Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.
2. Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd
3. Gunter K. V. Mosby Company
4. Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincott Williams & Wilkins

BINOCULAR VISION I&II (PRACTICAL)(UE)

PRACTICAL :

Deals with hand-on session the basic binocular vision evaluation techniques.

1. Diplopia Charting
2. Hess Charting
3. Prism Trial (Ground prism, Fresnel Prism, Yoke Prism)
4. Vision Therapy

ORTHOPTICS

1. Stereopsis- (Global and Local)
2. Worth four dot test (Distance and Near)
3. Maddox rod, wing,
4. Cover test (Cover, Uncover, Alternate cover)
5. PBCT (Prism bar cover test)
6. Thorington
7. AC/A ratio (Heterophoria method/ Gradient method)
8. NPC (Accommodative target & Red/Green filter)
9. NPA (OD, OS, OU)
10. MEM (Monocular Estimation Method)
11. NRA
12. PRA
13. NFV & PFV (Distance),NFV & PFV (Near)
14. Vergence facility (12BO & 3BI) (Distance and Near)
15. Accommodative facility with flippers (+/-2.00 DS, +/-1.50 DS, +/-1.00 DS) (OD, OS, OU)

SPORTS VISION (IE)

OBJECTIVES:

- The subject provides suitable knowledge for students to understand the visual needs of athletes for various kinds of dynamic and static sports, vision training, protective and vision correction options.
- To make students understand the visual demands for various sports activities for athletes
- To make students understand the various visual correction and sports vision training options available to enhance visual skills of athletes
- To make students understand the various kinds of sports injuries and sports protective devices available

UNIT -I

- Principles of Vision Training
- Introduction to Sports Vision- History of Sports Vision, Definitions of Terms
- Vision and Sports- Vision Performance and Athletics
- Equipment List
- Sports Terminologies

UNIT -II

- Sports Vision Examinations- Visual Acuity, High Contrast Refraction, Color Vision, Stereopsis, Dominant Eye / Hand, Eye Health, Cover Test, Ocular Motility, Visual Field, Night Vision, Glare Sensitivity, Glare Recovery
- Visual Skills Description and Training Procedures

UNIT -III

- Accommodation – Vergence Facility, Distance Fixation Disparity, Dynamic Visual Acuity, Eye-Hand Co-ordination, Response Speed, Eye-Foot Co-ordination, Response Speed, Eye-Foot-Body Balance, Peripheral Awareness, Anticipation Timing, Visual Concentration, Speed of Recognition, Visual Concentration, Speed of Recognition, Visual Adjustability, Peripheral Reaction Time, Visualization, Speed of Focusing, Increased Fusional Reserve, Fixation Ability, Visual Memory, Spatial Localization, Visual Skills in Sports and Prescription in the form of vision correction

UNIT -IV

- Designing Sports Vision Programs
- Sports-related Injuries and First Aid
- Post trauma vision syndrome and Visual Midline Shift Syndrome
- Special Concerns Dyslexia, Down's Syndrome
- Orthoptic Evaluation- Identification of sports eye wear for various sports Identification of sports protective devices, Dispensing of various kinds of sports eyewear.

Reference Books:

1. Sports Vision by DFC Loran and C J MacEwen Publishers: Butterworth and Heinmann
2. Sports Vision by Graham Erickson Publishers: Butterworth and Heinmann

SPECIAL CLINICS II (IE)

A Logbook is maintained with case sheets of complete management and follow-ups:

1. Direct ophthalmoscope
2. Visual Field chart interpretation
3. B scan Interpretation
4. A scan chart Interpretation
5. Case Analysis
6. Gonioscopy
7. IDO
8. Case Analysis

SEMESTER-VII

| S.NO | SUBJECT |
|-------------|--|
| 1 | Project/ Dissertation |
| 2 | Biostatistics and Research Methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

UNIT-I Statistics Definition and Terms

- What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability:

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution:

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation:

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK Mahajan Jaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S Sundar Rao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publicatons pvt ltd, 2008
4. Introductory Statistics. Prem S.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences, Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. Cardiac and Perfusion Technology

Regulations, Curriculum and Syllabus
2017



Dr. M. G. R. EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be University)

MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science)

should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course

on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN-

SEMESTER- I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks **DURATION** -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

- (i) Theory 20 Marks
(ii) Practical 5 Marks

TOTAL 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -

3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

marks:80

Max

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)

3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420hrs

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SCHEME OF EXAMINATION

SEMESTER – III (CARDIAC AND PERFUSION TECHNOLOGY)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Anatomy, Physiology and Pharmacology Related to cardiac and perfusion technology- Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Anatomy, Physiology and Pharmacology Related to cardiac and perfusion technology- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Pathology related to cardiac and perfusion technology- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Pathology related to cardiac and perfusion technology- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics & Biosafety(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (CARDIAC AND PERFUSION TECHNOLOGY)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Electrocardiogram(ECG) – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Electrocardiogram(ECG) – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Principles of perfusion technology – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Principles of perfusion technology – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Sociology(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Basic and Advanced Life support(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER –V (CARDIAC AND PERFUSION TECHNOLOGY)

Total Hours: 390 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Perfusion technology part I– Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Perfusion technology part I- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Advance ECG and treadmill testing and basics of echo cardiography-Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Advance ECG and treadmill testing and basics of echocardiography-Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Environmental science and Community medicine (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER –VI (CARDIAC AND PERFUSION TECHNOLOGY)

Total Hours: 390 Hrs

| S.no. | PAPER | Hours/Semester | | Evaluation (Marks) | | | | |
|-------|---|----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Perfusion Technology part II - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Perfusion Technology part II - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Echocardiography and cardiac catheterization - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Echocardiography and cardiac catheterization - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Health care and basic principles (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)
Project/Dissertation

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|--------------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | TOTAL |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | BioStatistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

SEMESTER – VI & VIII (FOR ALL SPECIALITIES)

Internship -1 YEAR

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi
- c. Biceps

- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye ballSS

6. Viva Voce

- a. Radiology – Xrays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure, classification of nerve fibres,
- Muscles- classification, structure, Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism, types.

Ic. Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphology and functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition & functions of gastric juice.
- Pancreatic juice-composition, functions and regulation of pancreatic juice.
- Bile- composition, functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb. Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism

- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II. Estimation of Hemoglobin

III. RBC

IV. WBC

V. Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone

- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli

- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahlihemocytometer
- Neubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**
 - Pituitary gland
 - Pineal body
 - Thyroid & parathyroid gland
 - Adrenal
 - Pancreas
 - Gonads – Ovary & Testis
- **Cardio-Vascular System**
 - Heart
- **Lymphatic system**
 - Spleen
- **Respiratory System**
 - Lungs
 - Larynx
 - Trachea
- **Digestive System**
 - Salivary glands
 - Esophagus
 - Pharynx
 - Stomach
 - Liver, Gall bladder
 - Duodenum
 - Small intestine
 - Large intestine
- **Urinary system**
 - Kidneys
 - Ureter
 - Urinary bladder
- **Reproductive System**
 - Saggital section – Male & Female pelvis
 - Uterus & ligaments
 - Ovary
 - Prostate
 - Seminal vesicals
 - Vas deferens

- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition, normal values, intrapulmonary and intrapleural pressures, surfactant.
- Oxygen transport, carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia, cyanosis, Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus-hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.

- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida

4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis
- Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs

- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,

Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2rd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2rd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance – resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER – III

| S.NO | SUBJECT |
|-------------|--|
| 1. | Anatomy, Physiology and Pharmacology Related to cardiac and perfusion technology- Theory(UE) |
| 2. | Anatomy, Physiology and Pharmacology Related to cardiac and perfusion technology- Practical (UE) |
| 3. | Pathology related to cardiac and perfusion technology- Theory (UE) |
| 4. | Pathology related to cardiac and perfusion technology- Practical (UE) |
| 5. | Medical Ethics (IE) |
| 6. | Psychology (IE) |

B.Sc. CARDIAC PERFUSION TECHNOLOGY

SEMESTER – III

Anatomy, Physiology & Pharmacology related to Cardiac and Perfusion Technology-Theory(UE)

Course description:

This course will provide an outline of Anatomy, physiology, Pharmacology to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

At the end of the course the students should be able to:

Describe the structure of the cardiovascular system of the human body.

Define and describe basic physiological process governing the normal functioning of the human heart.

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of cardiovascular drugs.

To understand the pharmacological actions and mechanism of action of cardiovascular drugs used for different disease conditions.

Learning objective skills:

Identify the anatomical structure of the human heart.

Learn to correlate the physiological functions.

To know the therapeutic uses and adverse of the cardiovascular drugs used for different disease conditions.

UNIT- I:

1. Anatomy of the heart and great vessels
2. Gross anatomy and structural features of cardiac
chambers Atrium
Ventricle
AV junction
Heart valves
Specialized conduction tissues
3. Conduction system
Sinus node
Internodal
tracts AV node
Bundle of His
4. Systemic circulation
Arterial system
Venous system
Lymphatic system

Tissue perfusion and microcirculation

5. Pulmonary circulation
 - Pulmonary artery
 - Pulmonary veins
 - Bronchial artery
6. Cerebral circulation
7. Renal circulation
8. Fetal circulation

UNIT- II:

1. Innervations of the heart
 - Sympathetic
 - Parasympathetic
 - Sensory
2. coronary vascular system
 - Coronary arteries
 - Myocardial capillary bed
 - Venous drainage
 - Lymphatic drainage
3. Pericardium
4. Cardiac cycle
 - Mechanical events
 - Arterial cycle and central venous pressure cycle
 - Clinical aspects of human cardiac cycle
 - Heart sounds
5. Cardiac output
 - Assessment of cardiac output
 - Ficks principle
 - Thermal dilution and indicator dilution methods
 - Pulse Doppler method
 - Miscellaneous methods

UNIT-III:

1. Anatomy of Respiratory System
 - Mechanism of respiration
 - Principles of gas exchange regulation for respiration
2. Cardiac excitation and contraction
 - Mechanism of contraction
 - Pacemaker of conduction system
 - Nodal electricity
 - Nervous control of the heart rate

3. Vascular smooth muscle
 - Mechanism of contraction
 - Pharmacomechanical coupling, automaticity

UNIT-IV:

Cardiovascular responses in pathological situations

- Shock and hemorrhage
- Syncope
- Essential hypertension
- Chronic cardiac failure

UNIT-V:

Hematology and coagulation physiology of blood components

- Blood groups
- Blood transfusion
- Hemostasis

UNIT-VI:

1. Anti Anginal Agents

- beta blocking agents – propranolol, Atenolol, Metoprolol, Labetolol, Pindolol.
- Nitrates – Nitroglycerine ,Isosorbidedinitrate, Isosorbidemononitrate, transdermal nitrate patches.
- Calcium Channel blockers – Nifedipine , Verapamil , diltiazem , new calcium channel blockers.

2. Anti Failure Agents

- Diuretics – Furosemide, Thiazide diuretics, other thiazide like agents, Potassium sparing diuretics, combination diuretics, special diuretic problems.
- Angiotensin converting enzyme (ACE) inhibitors
- Types of ACE inhibitors – Captopril, Enalapril, ACE inhibitors for diabetics and hypertensive renal disease.
- Digitalis and acute inotropes – Digoxin ,Digitoxin, Dobutamine, Dopamine , Adrenaline, Nonadrenaline , Isoprenaline, Mixed inotropic vasodilators amrinon.

3. Anti hypertensive drugs

- Diuretics, beta blockers, Ace inhibitors, calcium antagonists, direct vasodialotrs,centrally active and peripherally active vasodialators.

4. Anti arrhythmic agents

Quinidine and related compounds, procainamide, lidocaine, mexiletine, phenytoin, flecainide, amiodarone, bretylium, combination therapy.

5. Antithrombotic agents

- Platelet inhibitors
 - Aspirin
 - Persantine
- Anticoagulants
 - Heparin
 - Warfarin
- Fibrinolytics
- Streptokinase
- Wrokinase
- Combination therapy

6. Lipid lowering and anti atherosclerotic drugs

7. Miscellaneous drugs

Protamine, Emergency drugs, Narcotics, Sedatives, Antihistamines, Antibiotics

RECOMMENDED BOOKS:

ANATOMY:

1. Manipal manual for Allied Health Science, sampath madhyastha.
2. B D Chaurasia: General human anatomy

PHYSIOLOGY:

1. Basics of medical physiology, D. Venkatesh, H.H. Sudhakar
2. Guyton and Hall Textbook of medical physiology, John E. Hall

PHARMACOLOGY:

1. Pre manual for undergraduates in pharmacology, Tara V Shanbag
2. Pharmacology for dental and allied health science, Padmaja Udhayakumar

REFERENCE BOOKS:

ANATOMY:

1. B D Chaurasia: General human anatomy
2. Richard S.Snell: clinical anatomy

PHYSIOLOGY:

1. Essentials of medical physiology, K. Sembulingam, Prema Sembulingam

PHARMACOLOGY:

1. Essentials of medical pharmacology, KD Tripathi
2. Basic and clinical pharmacology, Bertran G Katzung

Anatomy, Physiology & Pharmacology related to Cardiac and Perfusion Technology- Practical(UE)

Learning objective:

Expected to Describe the structure of the cardiovascular system of the human body.

Define and describe basic physiological process governing the normal functioning of the human heart.

To know the pharmacological actions and mechanism of action of cardiovascular drugs used for different disease conditions.

ANATOMY & PHYSIOLOGY:

Charts and Spotters:

Structural picture of the
heart. Conduction system
Coronary arteries
Pericardium
Systemic & pulmonary circulation
Cardiac cycle
Cardiac excitation & contraction
Cardiac output

Mechanism of respiration

PHARMACOLOGY:

Charts:

Mechanism of action of drugs
Adverse effects
Contraindications

Spotters:

Cardiovascular drugs

SPECIFIC LEARNING OUTCOME(SLO):

To gain knowledge on anatomical structures, physiological functions and pharmacological actions related to the cardiovascular system.

Pathology related to Cardiac and Perfusion Technology – Theory (UE)

Course description:

This course will provide an outline of Pathological disease conditions to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

At the end of the course the students should be able to:

To describe the pathological disease conditions related to the cardiovascular system.

To understand the diagnostic procedures and treatmental procedures relevant to the pathological disease condition.

Learning objective skills:

Learn to correlate the physiological functions and disease conditions

UNIT-I:

Congenital heart disease

a). cyanotic congenital heart disease

Tetralogy of Fallot

Transposition of great arteries

Total anomalous pulmonary venous connection.

Truncus arteriosus

Tricuspid atresia

b). Acyanotic heart disease

Atrial septal defect

Ventricular septal defects

Congenital valvular disease

Patent ductus arteriosus

Coarctation of aorta

UNIT-II:

Valvular heart disease

Congenital valvular heart disease

Rheumatic valvulities

Aortic stenosis

Aortic regurgitation

Mitral stenosis

Mitral regurgitation ; mitral valve

prolapsed Combined valvular disease

UNIT-III:

Coronary artery disease

Pathophysiology and clinical recognition

Angina pectoris

Symptomatic and asymptomatic myocardial ischaemia
Types and location of myocardial infarction
Surgical treatment; other treatment modalities.

UNIT-IV:

Hypertension
Heart failure

UNIT-V:

Myocardial diseases
Dilated cardiomyopathy
Hypertrophic cardiomyopathy
Restrictive cardiomyopathy
Myocarditis

Pericardial effusion
Constrictive pericarditis
Cardiac tamponade
Tumours of the heart.

RECOMMENDED BOOKS:

Cardiology, Desmond G. Julian, J. Campbell Cowan, James M. McLenachan.

Pathology related to Cardiac and Perfusion Technology – Practical (UE)

Learning objective:

To know the pathological disease conditions related to the cardiovascular system.

Charts and Spotters:

To give demonstration on pathological disease conditions related to cardiovascular system.

Congenital heart disease

Valvular heart disease

Coronary artery disease

Myocardial disease

Pericardial disease

SPECIFIC LEARNING OUTCOME:

To gain knowledge on pathological disease conditions and treatment related to cardiovascular system.

Psychology (IE)

UNIT 1 :Basic concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Behaviorist – Gestalt – Psychoanalysis – Humanistic. Fields of Psychology

UNIT 2: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter Personal Relations. Crowd Audience and Rumor, Definition Characteristics and Classification of Crowd and Audience Leadership: Definition of leader and leadership and characteristics, Types and Emergence of Leadership in a Group Attitude: Meaning, Types and Formation of Attitude Concept of adjustment and maladjustment, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts.

UNIT 3 : Hereditary and environment

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behaviour – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 4: Learning principles and methods

Meaning and Definition, Factors In The Process of Learning Classical conditioning Operant Conditioning – The principle of reinforcement Cognitive learning – Optimizing learning: Programmed learning and automated instruction – Transfer of learning Role of Reward and punishment in learning.

UNIT 5: Motivation , Emotion, Memory and forgetting

Physiological basis of motivation – Current status of motivational concepts Theories of motivation – Motivational factors in aggression Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 6: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests – Creativity and its tests Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality, Factors Affecting Personality

UNIT 7: Health Psychology

Meaning of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health. **Stress** - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “Introduction to Psychology” – 7th Edition. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron.A. Robert, Psychology, Pearson Education Vth Ed., 2002
3. David Krech And Richard S Crutehfield And Egerton L Ballachey: Individual And Society
4. Kuppuswamy B :Elements Of Social Psychology
5. Cooper B Joseph And James L Mc Gaugh: Integrating Principles Of Social Psychology
6. Shelley E. Taylor. Health Psychology Third Edition. McGraw Hill International Editions, 1995.
7. Swaminathan, V.D, Latha Sathish, Psychology for Effective Living, Department of Psychology, University of Madras.
8. Coleman, James. 1980. Abnormal Psychology and modern life. New Delhi: Tata McGraw Hill Ltd.

MEDICAL ETHICS AND BIOSTATICS (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

SEMESTER – IV

| S.NO | SUBJECT |
|-------------|--|
| 1. | Electrocardiogram(ECG) – Theory(UE) |
| 2. | Electrocardiogram(ECG) – Practical(UE) |
| 3. | Principles of perfusion technology – Theory(UE) |
| 4. | Principles of perfusion technology – Practical(UE) |
| 5. | Medical Sociology(IE) |
| 6. | Basic and Advanced Life support(IE) |

B.Sc. CARDIAC AND PERFUSION TECHNOLOGY

SEMESTER – IV

Electrocardiogram (ECG) – Theory (UE)

Course description:

This course will provide an outline of electrocardiogram (ECG)

Objectives:

At the end of the course the students should be able to:

To develop a knowledge about the diagnostic techniques for various conduction abnormalities.

To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Learning objective skills:

Learn to diagnosis the abnormalities with interpretation of the imaging techniques.

UNIT-I:

Basic principles

The electrocardiographic paper,

The electrical field of heart,

The leads; standard limb leads; precordial leads; V lead;

aVleads, Basic ECG deflections,

Normal ECG

- ❖ The P wave,
- ❖ The QRS complex,
- ❖ The genesis of the QRS complex,
- ❖ T wave;
- ❖ the ST segment
- ❖ The Q wave,
- ❖ Rate and rhythm,

- ❖ Rotation of the heart,
- ❖ The Q-T interval, electrical axis

UNIT-II:

ECG in Coronary artery disease-Myocardial
infarction QRS changes

- ❖ Evolution of electrocardiographic changes
- ❖ Localization of ischemia or infarction
- ❖ Non-infarction Q waves

Primary and secondary T wave

change Coronary insufficiency

UNIT-III:

Chamber enlargement

Left ventricular hypertrophy, Right ventricular hypertrophy

UNIT-IV:

Arrhythmias

- ❖ Sinus rhythm,
- ❖ Sinus arrhythmia
- ❖ Sinus tachycardia and bradycardia,
- ❖ Ectopic atrial rhythm
- ❖ Atrial extra systoles,
- ❖ Paroxysmal atrial tachycardia,

UNIT-V:

Atrial fibrillation and flutter,

Atria ventricular (AV) Nodal

rhythm, Ventricular rhythm,

Ventricular extra systoles,

Ventricular tachycardia,

Ventricular flutter / fibrillation

UNIT-VI:

Intraventricular conduction delays
Left anterior fascicular block
Left posterior fascicular block
Left bundle branch block
Right bundle branch block
Complete heart block

RECOMMENDED BOOKS:

Hand Book of Clinical Electrocardiography, Tapas Kumar Koley, 1st edition, New Central Book Agency (P) LTD
An Introduction to Electrocardiography LeoSchamroth, , eighth adapted edition, WileyIndiaPv.Ltd

REFERENCE BOOKS:

The ECG made easy, John R. Hampton, eighth edition, Churchill Livingstone

Electrocardiogram (ECG) – Practical (UE)

Learning objective:

To develop a knowledge about the diagnostic techniques for various conduction abnormalities.

To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

ECG spotters of all cardiac disease conditions

Protocols ,criteria's of TMT, ST segment depression chart

Specific learning outcomes (SLO):

Will be able to identify and explain the different cardiac rhythms and conduction defects from the given ECG

Will be able to explain ECG at the risk of cardiovascular emergencies

Can bring out the mechanism of ECG deflections in pathological situations

Can easily identify myocardial infarction / ischemia / arrhythmias from the given ECG

Principle of Perfusion Technology – Theory (UE)

Course description:

This course will provide an outline of equipments handling during cardiopulmonary bypass(CPB)

Objectives:

At the end of the course the students should be able to:

Assemble & prime the adult circuits.

Handling Heart-lung machine and equipments during cardiopulmonary bypass(CPB)

Learning objective skills:

Learn to handle the equipments.

UNIT-I:

1. Introduction & history of extra-corporeal circulations
2. Basic principles of
 - Extra-corporeal circulation
 - Materials used
 - Extra-corporeal gas exchange
3. Cross- circulation

UNIT-II:

1. Pumps
 - History of pumps
 - Ideal characteristics of pumps for extra-corporeal circuit
2. Design and functioning of roller pumps
 - Flow & calibration
 - Occlusion
 - Tubing guides
3. Design and functioning of centrifugal pumps

UNIT-III:

1. History of oxygenators
 - History of oxygenators
 - Design and function of disc- oxygenator
 - Design and function of bubble -oxygenators
 - Design and function of membrane –oxygenators

2. Hematological effects of membrane oxygenator to bubble oxygenator design including
 - Materials
 - Blood gas interface

UNIT-IV:

1. Tubings
 - Tubing materials
 - Resiliences and bio- compatibility
 - Heparin-coated surfaces
2. Filters
 - Arterial line filters
 - Cardiotomy filters
 - Gas line filters
 - Leukocyte depletion & significance
3. Heat exchangers
 - Materials
 - Principle and methods of heat exchange
 - Designs and functioning

RECOMMENDED BOOKS:

Cardiopulmonary Bypass: Principles and Techniques of Extracorporeal circulation,
Christina T. Mora
Cardiopulmonary bypass principles and practice, Glenn P. Gravlee, Richard E.Davis,
Alfred H. Stammers, Ross M. Ungerleider

Principle of Perfusion Technology – Practical (UE)

Learning objective:

At the end of the course the students should be able to:

Assemble & prime the adult circuits.

Handling Heart-lung machine and equipments during cardiopulmonary bypass(CPB)

Practicals / Demonstration:

Assembling and priming the adult circuits

Cross circulation

Pumps

Oxygenators

Tubings

Filters

Heat exchanger

SPECIFIC LEARNING OUTCOME:

To gain knowledge on operating heart-lung machine

Known to assemble the adult circuits

Known to prime the adult circuits

BASIC AND ADVANCED LIFE SUPPORT (IE)

BLS

TRIAGE

Primary Survey

Secondary Survey

Airway & Ventilatory
management Shock

Central & peripheral venous access

Thoracic trauma – Tension pneumothorax

Other thoracic injuries

Abdominal trauma – Blunt injuries

Abdominal trauma – Penetrating injuries

Spine and spinal cord trauma

Head trauma

Musculoskeletal trauma

Electrical injuries

Thermal burns

Cold injury

Pediatric trauma

Trauma in pregnant women

Workshop BLS

Workshop cervical spine immobilization

Imaging studies in trauma

The universal algorithm for adult ECC

Ventricular fibrillation/Pulseless ventricular tachycardia

algorithm Pulseless electrical activity (PEA) / asystole algorithm

Bradycardia treatment algorithm

Tachycardia Treatment

algorithm Hypotension / Shock

Acute myocardial infarction

Pediatrics Advanced life support

Defibrillation

Drugs used in ACLS

Emergency cardiac

pacing AED

Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

Auguste Comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist

Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system.

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7..C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications

SEMESTER – V

| S.NO | SUBJECT |
|-------------|--|
| 1. | Perfusion technology part I– Theory(UE) |
| 2. | Perfusion technology part I- Practical (UE) |
| 3. | Advance ECG and treadmill testing and basics of echo cardiography- theory(UE) |
| 4. | Advance ECG and treadmill testing and basics of echocardiography -Practical (UE) |
| 5. | Environmental science and Community medicine (IE) |

B.Sc. CARDIAC AND PERFUSION TECHNOLOGY
SEMESTER – V

Perfusion technology part I – Theory (UE)

Course description:

- This course will provide an outline of clinical techniques during cardiopulmonary bypass(CPB)

Objectives:

- At the end of the course the students should be able to:
- Learn to know various routes of administration of cardioplegic solutions Learn to know cannulation techniques
- Learn to know coagulation management during CPB Learn to know ventricular assist devices
- Learn to triturate acid-base management during CPB

Learning objective skills:

- Learn to handle IABP machine
- Known to administer cardioplegic solutions learn to administer drugs used during CPB

UNIT-I:

1. Cannulation techniques
 - Venous cannulation
 - Complications of venous cannulation
2. Arterial cannulation
 - Ascending aortic cannulation & complications
 - Femoral cannulation, indications & complications
 - Sites for arterial cannulation

UNIT-II:

1. Hemodilution & priming solutions for CPB
2. Coagulation management during CPB

UNIT-III:

1. Cardio-plegic solutions
 - St Thomas solution
 - Delnido cardio-plegic solution
 - HTK solution

UNIT-IV:

1. Intra-aortic balloon pump
 - Indications
 - Principle of function
 - Complications
2. Ventricular assist devices

UNIT-V:

1. Acid-base balance
2. Pre-CPB check list

RECOMMENDED BOOKS:

1. Cardiopulmonary Bypass: Principles and Techniques of Extracorporeal circulation, Christina T. Mora
2. Cardiopulmonary bypass principles and practice, Glenn P. Gravlee, Richard E.Davis, Alfred H. Stammers, Ross M. Ungerleider.

Perfusion technology part I – Practicals (UE)

Learning objective:

- Learn to know various routes of administration of cardioplegic solutions Learn to know cannulation techniques
- Learn to know coagulation management during CPB Learn to triturate acid-base management during CPB

Practicals / Demonstration:

- Assembling and priming the pediatric circuits
Cannulation
- Cardioplegic drugs
- IABP initiation & maintaining procedures VAD
- Drugs used in CPB

SPECIFIC LEARNING OUTCOME:

- To gain knowledge on cannulas used.
Initiation of IABP machine

B.Sc. CARDIAC AND PERFUSION TECHNOLOGY

SEMESTER – V

Advance ECG and Threadmil testing and basics of echocardiography:

Course description:

- This course will provide an outline of advanced ECG and threadmill stress test.

Objectives:

- At the end of the course the students should be able to:
- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques

UNIT-I:

ADVANCED ELECTRO CARDIOGRAPHY (ECG)

Basics of Holter Test/HUTT-

Connections of the Holter recorder

❖ Holter Analysis

❖ Guidelines for ambulatory electrocardiography

Indications and interpretation

UNIT-II:

Exercise stress testing- Exercise physiology, Exercise protocols, patient preparation ST segment displacement – types and measurement

Exercise test indications, contra-indications and precautions

UNIT-III:

Direct Current (DC)

shock Defibrillator

Monophasic and biphasic shock

Technique of cardioversion

Indications for cardioverion

UNIT-IV:

M- mode and 2D transthoracic echocardiography Views used in transthoracic echocardiography
Doppler echocardiography: pulsed, continuous wave and colour Measurement of cardiac dimensions

UNIT-V:

Evaluation of systolic and diastolic left ventricular function Regional wall motion abnormalities
Stroke volume and cardiac output assessment Orifice area
Continuity equation

RECOMMENDED BOOKS:

1. Hand Book of Clinical Electrocardiography, Tapas Kumar Koley, 1st edition, New Central Book Agency (P) LTD
2. An Introduction to Electrocardiography LeoSchamroth, , eighth adapted edition, WileyIndiaPv.Ltd

REFERENCE BOOKS:

1. The ECG made easy, John R. Hampton, eighth edition, Churchill Livingstone

Advance ECG and Threadmil exercise stress testing and basics of echocardiography

Learning objective:

To develop a knowledge about the diagnostic techniques for various conduction abnormalities.

To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

Disease conditions diagnosed by Echocardiogram Contrast and dobutamine stress testing

Specific learning outcomes (slo):

Will be able to identify abnormal conditions in echocardiography

Will be able to prove the pathological conditions by performing echo Capable of assisting in non-invasive / invasive procedures

Will be able to perform Echocardiography at cardiovascular emergencies

Will be able to use the diagnostic strategies by available proven methods in echocardiography

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

Natural Resources:

Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging, and salinity, Energy Resources.

Ecosystems:

Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

Biodiversity:

Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

Pollution:

Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

Social Issues Human, Population and Environment:

From Unsustainable To Sustainable Development, Urban Problems Related to Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust

Concept of health & disease

Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

Epidemiology:

Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology

(Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

Environmental & health:

Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

Air pollution & its effects. Prevention & Control of air pollution

Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

SEMESTER VI

| S.NO | SUBJECT |
|-------------|---|
| 1. | Perfusion Technology part II - Theory (UE) |
| 2. | Perfusion Technology part II - Practical (UE) |
| 3. | Echocardiography and cardiac catheterization - Theory (UE) |
| 4. | Echocardiography and cardiac catheterization - Practical (UE) |
| 5. | Health care and basic principles (IE) |

B.Sc. CARDIAC AND PERFUSION TECHNOLOGY
SEMESTER – VI

Perfusion technology part II – Theory (UE)

Course description:

This course will provide an outline of clinical techniques during cardiopulmonary bypass(CPB)

Objectives:

- At the end of the course the students should be able to:
 - ☐ To know the concepts of hypothermia
 - ☐ To know the effects of CPB on various organ system
 - ☐ To know the blood conservation techniques.
 - ☐ To know the extracorporeal membrane oxygenation(ECMO)
 - ☐ To know the ultra filtration techniques

Learning objective skills:

- Learn to know about cooling and rewarming strategies during CPB Learn to know about blood gas management
- Learn to know about the effects of CPB on various system Learn to know about ultra filtration & its types
- Learn to know about extracorporeal membrane oxygenation(ECMO)
- Learn to know about the Safety & management of perturbations during CPB

UNIT-I:

Myocardial protection

- a) Concepts of myocardial protection
- b) Clinical systems of myocardial protection
- c) Cardio-plegia
 - i) Composition
 - ii) Methods of administration
 - iii) Advantages & disadvantages

UNIT-II:

1. Hypothermia
 - a) Concept of hypothermia
 - b) Techniques to induce hypothermia
 - c) Total circulatory arrest

- d) Low-flow CPB
- 2. Cooling & re-warming strategies
 - a) Temperature monitoring sites
 - b) Gradients for warming & cooling
- 3. Blood gas management
 - a) Alpha stat
 - b) pH stat
 - c) Comparison of alpha & pH stat

UNIT-III:

Central nervous system – responses to
CPB Effects of CPB on

- Respiratory
- Renal
- Hepatic system

UNIT-IV:

Effects of CPB on immune system
Effects of CPB on endocrine system

UNIT-V:

Extracorporeal Membrane Oxygenation (ECMO)

UNIT-VI:

Blood conservation techniques in cardiac surgery

UNIT-VII:

Ultra filtration & types
Management of conventional & modified ultra-filtration

UNIT-VIII:

CPB for non-cardiac surgeries
Safety & management of perturbations during CPB

RECOMMENDED BOOKS:

1. Cardiopulmonary Bypass: Principles and Techniques of Extracorporeal circulation, Christina T. Mora
2. Cardiopulmonary bypass principles and practice, Glenn P. Gravlee, Richard E. Davis, Alfred H. Stammers, Ross M. Ungerleider.

Perfusion technology part II – Theory (UE)

Learning objective:

- Learn to know about cooling and rewarming strategies during CPB Learn to know about blood gas management
- Learn to know about the effects of CPB on various system Learn to know about ultra filtration & its types
- Learn to know about extracorporeal membrane oxygenation(ECMO)
- Learn to know about the Safety & management of perturbations during CPB

Practicals / Demonstration:

1. Cannulation and circulating the circuit.
Hypothermia
2. ABG analysis
3. ECMO circuit assembling and priming
Ultrafiltration (CUF & CUF)
4. CPB for non-cardiac surgeries
CPB in infants & children

SPECIFIC LEARNING OUTCOME:

1. To gain knowledge on strategies of hypothermia
ABG analysis
2. Ultra filtration
3. ECMO

Echocardiography and cardiac catheterization – Theory(UE)

Course description:

- This course will provide an outline of echocardiography and cardiac catheterization.

Objectives:

- At the end of the course the students should be able to:
- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques

UNIT-I:

- Echocardiography in Valvular heart disease:
- Mitral stenosis, Mitral regurgitation, Mitral valve prolapsed
Tricuspid stenosis, Tricuspid regurgitation
- Aortic stenosis, Aortic regurgitation
- Pulmonary stenosis, Pulmonary regurgitation

UNIT-II:

- Assessment of systolic and diastolic function

UNIT-III:

Echocardiography in Cardiomyopathies:

- ❖ Dilated cardiomyopathy
- ❖ Restrictive cardiomyopathy
- ❖ Hypertrophic cardiomyopathy
- ❖ Apical cardiomyopathy

UNIT-IV:

- Constrictive pericarditis
- Pericardial effusion and cardiac tamponade

UNIT-V:

- Echocardiographic detection of congenital heart disease:
 - ❖ Atrial septal defect
 - ❖ Ventricular septal defect
 - ❖ Patent ductus arteriosus
 - ❖ Coarctation of aorta

UNIT-VI:

Tetralogy of Fallot
Total anomalous pulmonary venous return
Tricuspid atresia
Transposition of great arteries
Double outlet right ventricle

UNIT-VII:

Left atrial thrombus
Left atrial myxoma
Infective endocarditis

UNIT-VIII:

Transesophageal echocardiography

UNIT-IX:

Stress Echo Cardiography and Contrast Echo Cardiography

CARDIAC CATHETERIZATION

- Type of catheters
- Catheter cleaning and packing
- Thermo dilution method
- Oxygen dilution method
- Principles of oximetry

Coronary angiography
Right heart catheterization and angiography

RECOMMENDED BOOKS:

The Echo Manual, Jae K Oh, third edition, Lippincott Williams and Wilkins
Practice of Clinical Echocardiography Catherine M Otto, fourth print Rev edition
,, W.B.Saunders Company

REFERENCE BOOKS:

The Echo made easy, Sam Kaddoura, Churchill Livingstone, second edition
Feigenbaum's echocardiography, William F Armstrong, Thomas Ryan seventh
edition, Wolters Kluwer

Echocardiography and cardiac catheterization – Practical(UE)

Learning objective:

- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

- Disease conditions diagnosed by Echocardiogram
Contrast and dobutamine stress testing

Specific learning outcomes (slo):

- Will be able to identify abnormal conditions in echocardiography
- Will be able to prove the pathological conditions by performing echo
Capable of assisting in non-invasive / invasive procedures
- Will be able to perform Echocardiography at cardiovascular emergencies
- Will be able to use the diagnostic strategies by available proven methods in echocardiography

HEALTH CARE MANAGEMENT & BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

- ☐ Health in Medical Care
- ☐ Indigenous systems of Health Care & their relevance
- ☐ Framework for Health Policy Development

2. Health Organisation

- ☐ Historical development of Health Care System in the third world & India
- ☐ Organization & Structure of Health Administration in India
- ☐ Type of Health Organization including International Organizations
- ☐ Private & Voluntary Health care provider
- ☐ Distribution of Health Care Services
- ☐ Health Care System in Public Sector Organization
- ☐ Health systems of Various Countries

3. Health Policy and National Health Programme

- ☐ National Health Policy
- ☐ Drug Policy
- ☐ National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- ☐ Evaluation of Health Programs (Developing indicators for evaluation)
- ☐ Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- ☐ Scope & Coverage
- ☐ Demand for Health Services
- ☐ Health as an Investment
- ☐ Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- ☐ Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- ☐ Rationale for Government action
- ☐ Household capacity, income and schooling

7. Economics of Health

- ☐ Population based health services
- ☐ Economics of Communicable and Non Communicable diseases

8. Health Insurance

SEMESTER-VII

| S.NO | SUBJECT |
|-------------|-------------------------------------|
| 1. | Project / Dissertation |
| 2. | Statistics and research methodology |

SEMESTER-VII

STATISTICS & RESEARCH METHODOLOGY

What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

Cumulative frequency curve – Ogives – Drawing inference from graph.

Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations.

Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

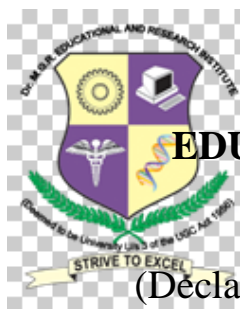
Tests of significance need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -1 year



Dr. M. G. R.

EDUCATIONAL AND RESEARCH INSTITUTE

UNIVERSITY

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

**B.Sc. RADIOLOGY AND IMAGING
TECHNOLOGY**

Regulations, Curriculum and Syllabus

2017



Dr. M. G. R.

EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be University)

MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry, Biology
- ii) Physics, Chemistry, Botany and Zoology

b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

2¹/₂ Hours

MAX.MARKS- 60 Marks **DURATION -**

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19.Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.

g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|--------------|-----------------|------------------------|------------------|--|------------------|---|------------------|--------------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 400

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|--------------|------------------|-------------------------|------------------|--|------------------|---|------------------|--------------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SCHEME OF EXAMINATION

SEMESTER – III (RADIOLOGY AND IMAGING SCIENCE TECHNOLOGY)

Total Hours: 420 Hrs

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Anatomy, Physiology, Pathology and Pharmacology related to Radiology- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Anatomy, Physiology, Pathology and Pharmacology related to Radiology – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Radiological Physics and Dark Room Techniques Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Radiological Physics and Dark Room Techniques Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics and Bio safety(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (RADIOLOGY AND IMAGING SCIENCE TECHNOLOGY)

Total Hours: 420 Hrs

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Radiology equipments -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Radiology equipments- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Positioning Radiography and Contrast Procedures - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Positioning Radiography and Contrast Procedures- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Basics and Advanced Life support (IE) | 30 hours | - | - | - | - | 50 | 50 |
| 6. | Sociology (IE) | 30 hours | - | - | - | - | 50 | 50 |

SEMESTER –V (RADIOLOGY AND IMAGING SCIENCE TECHNOLOGY)

Total Hours: 390 Hrs

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Basic and Advanced Ultra Sound Imaging - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Basic and Advanced Ultra Sound Imaging - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Basic and Advanced CT Scan -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Basic and Advanced CT Scan - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Community medicine (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (RADIOLOGY AND IMAGING SCIENCE TECHNOLOGY)

Total Hours: 390 Hrs

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Basics and advanced MRI - Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Basics and advanced MRI - Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Interventional Radiological procedures and Basic angiography- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Interventional Radiological procedures and Basic angiography - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Healthcare and basic Principles(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.no | PAPER | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|-------------------------------------|------------------|-----------|-----------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation | - | - | 100 | - | 100 | - | 200 |
| 2. | Statistics and research methodology | 30 hours | - | - | - | - | 50 | 50 |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

OBJECTIVES:

The course builds on the experience and skills of qualified radiographers, adding professional development skills and knowledge, and also provides for students to enhance their academic skills.

Radiology is the branch or specialty of Medicine that deals with the study and application of Imaging Technology like X-ray, MRI, Ultrasound and Radiation to Diagnosing and treating diseases. Radiology Technologists are Health Care Professional who perform diagnostic Imaging procedures and are responsible for accurately positioning patients and ensuring that a quality diagnostic image is produced. Radiology Technologist is also a very specialized skilled person with high knowledge on technology and its usage on high end machines in Radiology department. Radiology Technologists produce clear and accurate images of the body that enable physicians to diagnose and treat medical conditions that would otherwise be difficult to document. Radiology Technologists operate sophisticated high end equipment that includes X-ray, Ultrasound, Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) scan devices. They also assist Radiologist in many interventional procedures and well trained to handle emergencies.

SEMESTER I

| S.no | SUBJECT |
|-------------|----------------|
| 1 | ANATOMY-I |
| 2 | PHYSIOLOGY-I |
| 3 | BIOCHEMISTRY-I |
| 4 | MICROBIOLOGY-I |
| 5 | PATHOLOGY-I |
| 6 | ENGLISH |

SEMESTER - I

ANATOMY – I

COURSE DESCRIPTION:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

OBJECTIVES:

- **At the end of the course the student should be able to:**
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

LEARNING OBJECTIVES: SKILLS

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

UNIT I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, sub cellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

UNIT II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicle skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- **Joints** – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastronemius and diaphragm.

UNIT III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

- 1. Histology – Epithelium**
- 2. Axial & Appendicular Skeleton With Names & Number Of Bones**
- 3. Muscles**
 - a. Trapezius
 - b. Latissimusdorsi
 - c. Biceps
 - d. Triceps
 - e. Deltoid
 - f. Gluteus Muscles
- 4. Nervous System**
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - d. Spinal Cord
- 5. Special Senses**
 - a. Tongue
 - b. Ear
 - c. Skin
 - d. Eye ball
- 6. Viva Voce**
 - a. Radiology – X-rays
 - b. Osteology
 - c. Charts
 - d. Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampath madhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I,II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY - I

OBJECTIVES OF THE COURSE:

At the end of this course the students should be able to:

- Comprehend basic terminologies used in the field of Human Physiology.
- Define and describe basic Physiological Processes governing the normal functioning of the human body.
- Apply this knowledge in their Allied Health Science practice.

CONTENTS

UNIT I

Ia. General physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve & muscle

- Nerve structure, classification of nerve fibres,
- Muscles-classification, structure, Neuro-Muscular junction (NMJ),
- Muscle contraction – mechanism, types.

Ic. Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes – Morphology and functions
- Leucocytes – Morphology and functions
- Platelets-Morphology and functions
- Blood groups

UNIT II

IIa. Digestive system

- Salivary glands - Nerve supply, functions of saliva
- Gastric juice - composition & functions of gastric juice.
- Pancreatic juice – composition, functions and regulation of Pancreatic juice
- Bile – composition, functions of bile & bile salts.
- Succus entericus and small intestinal movements
- Deglutition, vomiting, functions of large intestine.

II b. Excretory system

- Structure of Nephron and its blood supply, Juxta Glomerular Apparatus (JGA)
- Formation of urine- Filtration, Reabsorption & Secretion
- Counter-Current mechanism
- Micturition

PRACTICAL AND DEMONSTRATION

1. Hemocytometer and Microscope
2. RBC
3. Blood Grouping
4. Charts and spotters

BIOCHEMISTRY- I

OBJECTIVES:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobin, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

UNIT I - CARBOHYDRATES

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

UNIT II - LIPIDS

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

UNIT III - VITAMINS

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

UNIT IV - ENZYMES

- Definition,
- Classification,
- Coenzymes,
- Factors affecting enzyme activity, Types and examples of enzyme inhibition

BIOCHEMISTRY PRACTICALS

| S.no. | PRACTICALS |
|--------------|---|
| 1 | Reactions of Glucose |
| 2 | Reactions of Fructose |
| 3 | Reactions of Maltose |
| 4 | Reactions of Lactose |
| 5 | Tests for Sucrose |
| 6 | Tests for Starch |
| 7 | Identification of unknown Carbohydrates |
| 8 | Spotters |

BIOCHEMISTRY SPOTTERS

The student must identify the spotter and write some important uses of the spotter.

CRYSTALS

1. Maltosazone
2. Lactosazone
3. Glucosazone/Fructosazone

REAGENTS

1. Benedict's reagent
2. Barfoeds reagent
3. Foulgers reagent
4. Seliwanoff reagent
5. Fouchets reagent

CHEMICALS

1. Sodium Acetate
2. Phenylhydrazine
3. α Naphthol

STRUCTURES.

1. Structure of Cholesterol
2. Structure of Glucose
3. Structure of Fructose

STRUCTURES.

1. Carrots
2. Rickets
3. Scurvy
4. Egg

PATHOLOGY – I

CONTENTS

1. Introduction to cell

- Normal Cell Structure and functions

2. Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological Calcification

3. Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4. Infectious Disease

- TB
- Leprosy

5. Hemodynamic Disorders

- Edema
- Thrombosis and Embolism
- Shock

6. Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant Neoplasm
- Pathogenesis of Cancer
- Spread of Cancer

7. Genetic Disorders

- Down's Syndrome
- Klinefelter Syndrome
- Turner Syndrome

8. Radiation

- Biological Effect of Radiation

PRACTICALS

1. DIFFERENTIAL COUNT

- Spotter

2. GROSS (SPOTTER)

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

3. INSTRUMENTS

- Westergrens ESR tube
- Sahli hemocytometer
- Neubaur's chamber
- Bone Marrow Needle

MICROBIOLOGY -I

OBJECTIVE:

At the end of the semester the students should be able to

1. Know the concepts of sterilization and disinfection procedures and their applications.
2. Understand the basic principles of immunology.
3. Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

CONTENTS

UNIT I:

General Microbiology - History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

UNIT II :

Immunology - Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

UNIT III:

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICALS

I. Gram staining

II. Spotters:

1. Disposable syringe
2. Sterile cotton swab
3. Bacteriological loop
4. Sterile tube
5. McIntosh fildes Jar
6. Autoclave
7. Nutrient Agar plate
8. Mac Conkey agar plate
9. Mac Conkey with LF
10. Mac Conkey with NLF
11. Blood agar plate
12. L J Media
13. RCM
14. BHI broth
15. Antibiotic susceptibility test
16. Gram Positive Cocci in Clusters
17. Gram negative bacilli
18. AFB
19. VDRL Slide
20. Microtitre plat

ENGLISH

GENERAL OBJECTIVES:

- To improve comprehensive and writing skills in English
- To discuss about effective communication skills
- To prevent barriers in communication.

1. Grammar

- Components of a sentence
- Positive and Negative statements
- Interrogative Statement
- Parts of speech in brief
- Transformation and synthesis of sentences
- Verb and Tense forms
- Voice
- Reported Speech
- Common errors and how to avoid them

2. Vocabulary

- Medical Terminology
- Words often confused or misused
- Words and expression in British and American English
- Idioms and Phrases

3. Oral communication

- Importance of speaking efficiently
- Voice culture
- Preparation of Speech
- Secrets of good delivery
- Audience Psychology
- Presentation Skills
- Using non-verbal communication
- Interview technique
- Skill in arguing

4. Spoken English

- The phonetic symbols
- Stress
- Intonation
- Rhythm
- Transcription
- Using dictionaries for learning to pronounce

5. Written communication

(a) Art of writing

- Rules for effective writing
- Expansion of proverbs & Ideas
- Précis writing

(b) Letter writing

- Private letters & Social letters
- Business letters
- Letter to a Bank
- Letter to a Newspaper
- Letter to Application
- Curriculum Vitae (Different models)
- Placing an order

(c) Report writing

- Guidelines to prepare a good report
- Usage of impersonal language
- Preparing lab reports

(d) Note making and Note taking

- Note making and note taking strategies
- Organizing notes
- Exercise and note making / taking

(e) Comprehension

- Listening and reading comprehension
(Exercise of prescribed short answers)

6. Reading

- (a) What is efficient and fast reading?
- (b) Awareness of existing reading habits
- (c) Tested techniques for improving speed
- (d) Improving concentration and comprehension through systematic study.

Reference Books:

1. English for Competitive Examinations by R.P.Bhatnagar, Rajiel Bhargava
2. English for college and competitive exams by Dyvadatham
3. Written Communication in English by Sarah Freeman
4. Writing with a purpose by Tickoo & Sasikumar
5. English phonetics for Beginners by P.Iyadurai
6. English through reading by W.Bhaskar and N.S.Prabhu
7. Empowerment through verbs & idioms by Padmini devkumar
8. High School English Grammar and Composition by Wren & Martin
9. Communication techniques for your success everywhere by Muralidharan

SEMESTER-II

| S.no | SUBJECTS |
|-------------|------------------|
| 1 | ANATOMY-II |
| 2 | PHYSIOLOGY-II |
| 3 | BIOCHEMICAL-II |
| 4 | MICROBIOLOGY-II |
| 5 | PATHOLOGY-II |
| 6 | PHARMACOLOGY |
| 7 | MEDICAL PHYSICS |
| 8 | COMPUTER SCIENCE |

SEMESTER – II

ANATOMY – II

CONTENTS

UNIT IV

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

UNIT V

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

UNIT VI

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary, vagina, vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

1. Endocrine System

- a. Pituitary gland
- b. Pineal body
- c. Thyroid & parathyroid gland
- d. Adrenal
- e. Pancreas
- f. Gonads – Ovary & Testis

2. Cardio -Vascular System

- a. Heart

3. Lymphatic system

- a. Spleen

4. Respiratory System

- a. Lungs
- b. Larynx
- c. Trachea

5. Digestive System

- a. Salivary glands
- b. Esophagus
- c. Pharynx
- d. Stomach
- e. Liver, Gall bladder
- f. Duodenum
- g. Small intestine
- h. Large intestine

6. Urinary system

- a. Kidneys
- b. Ureter
- c. Urinary bladder

7. Reproductive System

- a. Saggital section – Male & Female pelvis
 - i. Uterus & ligaments
 - ii. Ovary
 - iii. Prostate
 - iv. Seminal vesicals
 - v. Vas deferens
 - vi. Testis

8. Viva Voce

- a. Radiology – X rays
- b. Osteology
- c. Charts
- d. Models

Recommended books:

- 3. Manipal manual of Anatomy for Allied Health Sciences, Sampath madhyastha.
- 4. B D Chaurasia: General human anatomy.

References:

- 3. B D Chaurasia: Regional Anatomy. Vol I, II,III.
- 4. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II

CONTENTS

UNIT-III

Cardiovascular system

- Cardiac muscle, action potential & Conducting system of the heart
- Cardiac cycle
- ECG, heart sounds, Heart Rate
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure – Definition, measurement, factors maintaining B.P, Regulation of B.P
- Regional circulation – Coronary and Cerebral.

UNIT-IV

Nervous system

- Structure & Properties of Neuron
- Nerve – Classification, injury
- Types and properties of Receptors
- Synapse and synaptic transmission,
- Reflex and its properties
- Spinal cord – Ascending & Descending tracts
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid
- Autonomic nervous system.
- Ascending and Descending tracts

UNIT -V

Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities – definitions, normal values, intra pulmonary and intra pleural pressures, surfactant
- Oxygen transport, Carbon-dioxide transport
- Neural and chemical regulation of respiration
- Hypoxia, cyanosis, Artificial Respiration

UNIT-VI

Special sense and skin

- Vision,
- Audition
- Olfaction
- Gustation

UNIT -VI

Reproductive system:

- Male reproductive organs - Spermatogenesis and Testosterone actions
- Female reproductive organs - Menstrual cycle
- Contraception Methods

UNIT-VII

Endocrine system

- Hypothalamo hypophyseal inter relationship
- Anterior pituitary hormones and their functions
- Posterior pituitary hormones and their actions
- Thyroid hormones, biosynthesis and functions
- Parathyroid hormones, functions
- Insulin, Glucagons, actions and Diabetes mellitus
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions

PRACTICAL AND DEMONSTRATION

1. WBC
2. Blood pressure
3. Bleeding time
4. Clotting time
5. Charts and spotters

BIOCHEMISTRY – II

UNIT V - PROTEINS

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

UNIT VI -- NUCLEIC ACIDS

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

UNIT VII - HAEMOGLOBIN

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

UNIT VIII-- MINERALS

- Macro & Minor Minerals & Metabolism

UNIT IX -- NUTRITION

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

UNIT X -- ORGAN FUNCTION TEST

- LFT
- RFT

UNIT XI - ACID BASE BALANCE

- pH Homeostasis
- Buffers
- Acidosis
- Alkalosis

BIOCHEMISTRY PRACTICALS

| S.NO. | PRACTICALS |
|-------|---|
| 1 | Non- Protein Nitrogenous Substances |
| 2 | Analysis of Constituents of Normal urine |
| 3 | Analysis of Constituents of abnormal urine |
| 4 | Identification the constituents of Abnormal Urine |
| 5 | Estimation of Glucose in Blood |
| 6 | Estimation of Urea in Blood |
| 7 | Spotters |

BIOCHEMISTRY SPOTTERS

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

PATHOLOGY - I

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

-Infections

8. BONES and JOINTS

-Septic Arthritis

-Osteomyelitis

-Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICALS

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

MICROBIOLOGY - II

UNIT I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

UNIT II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

UNIT III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris,Ancylostoma) and Lab diagnosis of parasitic infections

UNIT IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICALS

I. SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II. Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,Satish Patwardhan – Handbook of Practical examination in Microbiology.

ONLINE REFERENCES:

1. www.microrao.com
2. www.slideshare.net

PHARMACOLOGY

OBJECTIVES:

- To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.
- To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.
- To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

INTRODUCTION:

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

UNIT I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

UNIT II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

UNIT III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

UNIT IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

UNIT V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

UNIT VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids, Anti thyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

Pharmacology (Practical)

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

| | |
|---|--|
| Needles | Intravenous |
| | Intrathecal |
| | Spinal |
| | Intra arterial |
| Students Discussion | Syringes: Tuberculin |
| Insulin | |
| I.V cannula | |
| Scalp. Vein set | |
| Students Discussion | Enema can |
| | Inhalers |
| Spacers | |
| Nebulizers | |
| Students Discussion | Tablets – Enteric coated, Sustained release, Sub-lingual |
| Students Discussion | Capsules, Spansules, Pessary, Suppository |
| Students Discussion | Topical Preparation, Ointment, Lotion, Powder, |
| | Drops – eye / ear |
| Charts: Mechanism of action of drugs, adverse effects, toxicology | |
| Spotters: drugs | |

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

MEDICAL PHYSICS

UNIT 1: Basic Concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

UNIT 2: Electromagnetic Induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

UNIT 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

UNIT 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

UNIT 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

UNIT 6: Semiconductor Devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

UNIT 7: Bio potential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Bio potential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

COMPUTER SCIENCE

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

Reference Books:

1. C Programming Tutorial (K & R version 4) Author(s): Mark Burgess
2. An introduction to GCC by Brian J.Gough, foreword by Richard M.Stallman
3. Red Hat Linux 9 bible by Christopher Negus May 2003
4. Microsoft office 2003 by Jennifer Ackerman Kettell, Guy Hart-Davis

SEMESTER III

| S. no | SUBJECTS |
|--------------|---|
| 1 | ANATOMY, PHYSIOLOGY, PATHOLOGY AND PHARMACOLOGY RELATED TO RADIOLOGY– THEORY (UE) |
| 2 | ANATOMY, PHYSIOLOGY, PATHOLOGY AND PHARMACOLOGY RELATED TO RADIOLOGY– PRACTICAL (UE) |
| 3 | RADIOLOGICAL PHYSICS AND DARK ROOM TECHNIQUES – THEORY (UE) |
| 4 | RADIOLOGICAL PHYSICS AND DARK ROOM TECHNIQUES – PRACTICAL (UE) |
| 5 | MEDICAL ETHICS |
| 6 | PSYCHOLOGY |

SEMESTER-III

ANATOMY, PHYSIOLOGY, PATHOLOGY AND PHARMACOLOGY RELATED TO RADIOLOGY– THEORY (UE)

OBJECTIVES:

- Expected to have basic knowledge on human anatomy, physiology, pathology and pharmacology.
- To develop exhaustive ideology of various pathological and Pharmacological aspects in relation to radiology

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding during an emergency and trauma.
- Will be able to provide better support during radiological examinations with knowledge of pharmacological aspects.

UNIT –I

Introduction and general considerations

- General-Topographical and other general terms employed,
- Cell structure and function, Tissues- differentiation
- Bone structure, development and ossification;
- Skin- Elementary account of structure and physiology of the skin with special reference to the effects of Radiation
- Ductless Glands-Surface
- Markings, thyroid gland and parathyroid, suprarenal glands, pituitary gland, thymus gland and pineal body;
- Pathology in Relation to Radiographic Applications / General Pathological Terms- Inflammation – pyrexia, ulcer, bacteria and the specific granulomata neoplasms benign, malignant, with some examples, Common pathological terms related to all systems;
- Lymphatic System - Surface markings, tonsils, elementary physiology of the Lymphatic system.

UNIT-II

Musculoskeletal System

- Osseous System - Detailed description of bones and joints of the upper limb, shoulder girdle, lower limb, pelvic girdle, vertebral column, thorax, skull and their radiographic Appearance. Skull with reference to nasal bones, sinuses, temporal bone & teeth;
- The Muscular System - Voluntary and involuntary muscles with special attention to the following - Sternocleidomastoids, pectoralis major, diaphragm, iliopsoas deltoid, supraspinatus, biceps, triceps, brachialis, quadriceps femoris, erector spinae.

UNIT-III

Cardio-respiratory, Alimentary and Urinary Systems

- The Cardiovascular System - Structure and function of heart and main vessels. Their principal relations
- Composition of blood. Radiographic appearances of heart and aorta in various projections;
- The Respiratory System - Structure, position and function of nose, pharynx, larynx, trachea, bronchi, lungs and pleura with surface markings, anatomy and significance of the mediastinum;
- Elementary Physiology of Respiration - Radiographic appearance of the larynx, pharynx and trachea of the chest in various projections;
- The Alimentary System - position and function of the buccal cavity, tongue, salivary glands, pharynx, esophagus, stomach, small intestine, large intestine, liver, gall bladder and pancreas. Radiographic surface markings;
- The Urinary System - Structure, position and function of kidney, ureters, bladder and urethra, Radiographic surface markings.

UNIT-IV

Nervous System ,Reproductive System and Elementary Pathology

- The Nervous System - Spinal cord, meninges, secretion and circulation of the CSF. Radiographic appearance of the central nervous system following use of contrast media;
- Reproductive System - The uterus and tubes as shown by the injection of opaque media, Anatomy of male reproductive system;
- Elementary Pathology of Common Conditions - Benign tumors, malignant tumors, epithelial tumors, connective tissue tumors, nervous tissue tumors, tumors of the Haemopoietic and reticulo-endothelial System, leukemia.

UNIT-V

Contrast Media and Patient Care

- Contrast Pharmacology - Types of contrast media. Ionic and non-ionic contrast media, Testing of sensitivity administration of proper dose, Advantages of non-ionic contrast media, Mild to major reactions and management of the same; Patient Care in Radiology Department - Care and comfort of the patient,
- Handling of patient – fracture cases lifting of injured patients; Records of patients - Temperature, pulse and needles
- Higginson's syringe – catheters, tourniquets etc) treatment of shock – surgical – electrical, first aid for such occurrences as fainting, vomiting, epilepsy, etc, common medical and surgical terms. Psychological approach to patient as an individual not as a case in relation to pathological condition – handling of fracture cases – stretcher and bed patient – method of dealing with helpless patients – ventilation and temperature of x-ray room and cross infection, general hygiene – organization to avoid delay – waiting and rest rooms – special apparatus for children.

Text Books:

1. Human Anatomy , B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013
2. Textbook of physiology, A.K.Jain, Fifth edition, Avichal Publishing Company , 2014
3. Text book of pathology, Harsh Mohan, Second Edition, Jaypee Brothers Publishers, 2013

Reference Books:

2. Human Anatomy , B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013
3. Textbook of physiology, A.K.Jain, Fifth edition, Avichal Publishing Company , 2014
4. Essentials of medical pharmacology, Tripathi, 7th edition, Jaypee Brothers Medical Publishers, 2013

ANATOMY, PHYSIOLOGY, PATHOLOGY AND PHARMACOLOGY RELATED TO RADIOLOGY

PRACTICALS(UE)

CONTENTS

- Radiological surface anatomy
- Contrast agents
- Spotters
- Skeletal anatomy
- Film discussion
- Charts

Specific Learning outcomes (SLO):

- Will be able to express anatomical terminologies with clarity.
- Will be able to recognize improper physiological functions.
- Will gain competency in handling patients for Radiological examinations with knowledge on Pharmacological aspects.

RADIOLOGICAL PHYSICS AND DARK ROOM TECHNIQUES – THEORY (UE)

OBJECTIVES

- *Expected to have basic knowledge on Medical Physics and Electronics.*
- *To provide an introduction to concepts in radiation physics, radiation instrumentation, radiation safety*
- *To elaborate on operations of radiation detectors and radiographic film processing.*

Specific Learning Outcome (SLO):

- Gain knowledge on radiations and their interactions with matter.
- Gain knowledge on radiation safety and dose levels.
- Gain expertise on the dark room techniques and films for conventional radiography

UNIT-I

Radiation Physics X-Rays

- Electromagnetic radiations, waves and quanta, rectilinear propagation, inverse square law, general electromagnetic, spectrum, production and properties of X-rays; X-ray
- Spectrum: characteristic radiation and bremsstrahlung radiation. Effects of variations in the
- Tube potentials.

UNIT-IV

X – Rays Measurements

- Methods of measuring x-rays ionization measurement – realization of line roentgen parallel plate chamber. Principles of integrating, direct reading and condenser dosimeters half value layer Pocket dosimeter, chemical dosimetry,
- Scintillation detectors, solid state detectors, Film dosimetry, TLD, GM counter ionization chamber, proportional counter.

UNIT-V

Dark Room Techniques

Ideal dark room-construction-accessories-safelight, wet bench, dry bench, types of films, types of hangers, Automatic film processor-analysis the various parts of the unit maintenance, required chemicals and monitoring, Manual film processing-contents of developer and fixer-need of water bath, rinsing and various methods of drying, Types of films, manufacture of films, storage of films, film definition-density and contrast, characteristic curve, image defects, artifacts, film cassettes types of intensifying screens, Artifacts in Radiography.

Text Books:

1. X-ray Equipments for Radiographers, D. Noreen Chesney, Muriel O. Chesney, CBS publishers & distributors, third edition, 2005
2. Christensen's Physics of Diagnostic radiology, Thomas Curry, 4th edition, Lippincott Williams & Wilkins, 1990

Reference Books:

3. First Year Physics for Radiographers – George Hay, 2nd edition, Baillière Tindall, 1978.
4. Equipment in Diagnostic Radiology, E. Forster, Springer science and Business media, 2012.
5. X-ray Equipments for Radiographers, Noreen Chesney & Muriel Chesney, 3rd edition, Blackwell Scientific Publications, 1984.

**RADIOLOGICAL PHYSICS AND DARK ROOM
TECHNIQUES – PRACTICAL (UE)**

CONTENTS

- Radiation survey
- Leakage radiation test
- Manual Film Processing
- Automatic film processing
- Effect of temperature on film processing
- Effect of pH on film processing

Specific learning outcomes (SLO):

- Will be able to perform various radiation surveys.

- Will be able to demonstrate competency in interpretation image artefacts.
- Will be able to recognize variations in images based on the effect of parameters involved in film processing

PSYCHOLOGY

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning –

Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development
Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses
Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress

Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

MEDICAL ETHICS AND BIO SAFETY

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates’ oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

SEMESTER IV

| S.No | SUBJECT |
|-------------|---|
| 1 | RADIOLOGY EQUIPMENTS – THEORY(UE) |
| 2 | RADIOLOGY EQUIPMENTS – PRACTICAL(UE) |
| 3 | POSITIONING RADIOGRAPHY AND CONTRAST PROCEDURESTHEORY (UE) |

| | |
|---|--|
| 4 | POSITIONING RADIOGRAPHY AND CONTRAST PROCEDURES PRACTICAL (UE) |
| 5 | BASICS AND ADVANCED LIFE SUPPORT |
| 6 | MEDICAL SOCIOLOGY |

SEMESTER IV

RADIOLOGY EQUIPMENTS – THEORY(UE)

OBJECTIVES:

- Expected to have basic knowledge on medical physics and electronics
- To develop in depth knowledge on radiological physics
- To develop exhaustive ideology of instrumentation and controls involved in radiology equipment

UNIT-I

Radiological Physics, Apparatus

Introduction to general properties of radiation and matter. Fundamentals of nuclear physics and radioactivity, production of x-rays, Film characteristics, Contrast, Artefacts in radiography, Interaction of x-rays and gamma rays with matter and their effects on irradiated materials.

Interaction of x-rays with patients, radiation protection, Quality assurance, Miniature radiography, macro radiography and magnification techniques; Distribution of electric power; Mains-compensators-stabilizers-single phase-three phase mobile supply cable capacity, voltage drop-main switches, fuses earthing-effects of frequency Variations

UNIT-II

Transformers, Control of output

Construction-closed or open-core-voltage and power relations, functions of core-losses and regulations copper losses, iron losses-hysteresis and inherent regulations. Types of transformers high insulation transformers-condenser effect; Resistance control of primary transformer control of primary (acute transformer) dual control-continuous central

UNIT-III

HT General Circuits and Distribution, X-ray Tubes

Valve and metal rectifiers-mechanical rectifiers-self-suppression
types of generators radiographic half- phases condenser-therapeutic-
pulsating, HT distribution-bus bars stress shield chokes,

UNIT-V

Instruments and Controls, Accessories

Milliammeters – milliamperes - second meter-kilovolt meters-direct and pre reading layout of control desk contractor automatic and interlocked controls-exposure switches
(clock work electronics, synchronous electric photoelectric). Mammography, Digital

radiography, OPG, craniostat, Mobile X-ray, X-ray equipment for operation theaters, Dual energy X-ray absorptiometry; Moving grids, stationary grids curved and flat grids- focused and non-focused grids. Bucky tables, stands and pedestals, screening stands, serial devices, diaphragms, cones and applicators

UNIT-IV

Fluoroscopy

Basic principle-assembly image intensifiers-camera-filters, magnification DSA-the angiographic room-the generators-the X-ray tube-image intensifier-cine camera and associated optics-the television chain-cine film selection-processing and viewing digital fluoroscopy-Radiation safety.

Text Books:

1. X-ray Equipments for Radiographers,D. Noreen Chesney, Muriel O. Chesney, CBS publishers & distributors, third edition, 2005
2. Christensen's Physics of Diagnostic radiology, Thomas Curry, 4th edition, Lippincott Williams & Wilkins, 1990

Reference Books:

3. First Year Physics for Radiographers – George Hay, 2nd edition, Baillière Tindall, 1978.
4. Equipment in Diagnostic Radiology, E. Forster, Springer science and Business media, 2012.

X-ray Equipments for Radiographers, Noreen Chesney & Muriel Chesney, 3rd edition, Blackwell Scientific Publications, 1984.

Specific Learning Outcome (SLO):

- Will be able to explain first aid techniques for various emergency conditions.
- Will be able to explain triage during an emergency outcome.
- Will be able to provide better support during a lifesaving condition with knowledge on life support and resuscitation.

RADIOLOGY EQUIPMENTS - PRACTICAL (UE)**CONTENTS**

- Testing X-ray beam and light beam alignment.
- Magnification techniques with constant SID
- Magnification Techniques with constant OID
- Beam Alignment Test
- Focal shot test
- Grid alignment test
- Chart/ Spotters

outcomes (SLO):

- Will be able to gain hands on training on life support techniques.
- Will be able to recognize Triage levels during an emergency outcome.
- Will be able to show competency in handling emergency and trauma patients with knowledge on first aid and resuscitation methods.

OBJECTIVES:

- Expected to have basic knowledge on anatomy, physiology, and pathology.
- To develop understanding of various positioning methods for imaging a structure.
- To introduce the importance of positioning and procedures involved in Radiology.

**POSITIONING RADIOGRAPHY AND CONTRAST
PROCEDURES THEORY (UE)**

UNIT-I

Practice on the patient

Age, subject types and sex, anatomical landmarks-postural variations-erect and horizontal technique- respiratory movement and diaphragm level-regional densities-preparations-and immobilization of patient- pathological conditions-injuries, fractures and dislocations congenital, localized views-periodic examinations-use of dry bones-positioning terminology identification systems; The position of the patient, the relative position of the tube to the patient and to all the exposure factors.

UNIT-II

Upper limb, Lower limb and Pelvic Girdle

Techniques for hand-fingers-thumb-wrist joint-forearm-elbow joint-humerus - shoulder joint and sterno- clavicular joint; Techniques for foot-calcaneum-ankle joint-leg-knee

joint-patella-and femur (lower two thirds); Techniques for pelvic-iliac fossa-ischium and sacro iliac joint.

UNIT-III

Vertebral column, Bones of Thorax and skull

Techniques for Atlanto-occipital articulation, cervical vertebrae, cervico-thoracic thoracic junction, vertebrae, lumbar vertebrae, lumbosacral articulation, sacrum, coccyx; Techniques for sternum, ribs (upper and lower); Techniques for cranium, facial bones, sella turcica, temporal Bone and optic foraminae sinuses, mandible and temporo mandible joint.

UNIT-IV

Abdomen

Routine and radiographs on acute condition; Bedside radiography-techniques for acute chest conditions-

intestinal obstruction, abdominal perforations-vertebral injuries-skull injuries-fractures immobilized. Theatre

radiography-introduction to C-arm image intensifier-exposure and training.

UNIT-V

CONTRAST PROCEDURE

Barium swallow-Barium meal series-Barium enema-double contrast barium enema, small bowel enema, double and single contrast, ERCP, PTBD, sonograms, fistulograms, mammograms, IVU, retrograde pyelogram, MCU, AUG, Opposing Urethrogram. Sialogram, dacryocystogram, HSG, T-Tube cholangiogram, operative cholangiogram (on table in theatre), Radiographic image processing.

Text Books:

1. Clark's Positioning in Radiography, A. Stewart Whitley, Charles Sloane, Graham Hoadley, Adrian D. Moore, 12th edition, CRC Press, 2010.
2. Diagnostic Radiography, Glenda Bryan, 4th edition, SPCK Publishing, 1991.

Reference Books:

1. Clark's Positioning in Radiography, A. Stewart Whitley, Charles Sloane, Graham Hoadley, Adrian D. Moore, 12th edition, CRC Press, 2010.
2. Diagnostic Radiography, Glenda Bryan, 4th edition, SPCK Publishing, 1991.

Specific Learning Outcome (SLO):

- Learn the basics and principles of radiographic techniques and positioning of the patients.

- Learn the consequences of specific procedures adopted during radiographic examinations
- Learn about different procedures/indications/contraindications for various radiographic examinations

POSITIONING RADIOGRAPHY AND CONTRAST PROCEDURES – PRACTICAL (UE)

OBJECTIVES:

Expected to have basic knowledge on anatomy, physiology and pathology.

1. To inculcate knowledge on various radiographic anatomy based on disease conditions.
2. To elaborate on various procedures and positioning involved in radiologic imaging.

1. Contrast procedures
2. Film Criticism

3. Handling patient
4. Pre-medication and post-medication
5. Crash cart
6. Spotters / Chart
7. Radiographic materials

Specific Learning Outcomes (SLO):

- Develop practical skills of positioning the patient for various procedures in radiology.
- Demonstrate competency to identify and explain the anatomical structures from radiographs.
- Will be able to identify and utilize equipment during an emergency or trauma.
- Will be able to demonstrate competency in anaphylaxis management in support to a physician.

BASIC AND ADVANCED LIFE SUPPORT

- BLS
- TRIAGE
- Primary survey
- Secondary survey
- Airway & Ventilatory management
- Shock
- Central & peripheral venous access
- Thoracic trauma – Tension pneumothorax

- Other thoracic injuries
- Abdominal trauma – Blunt injuries
- Abdominal trauma – Penetrating injuries
- Spine and spinal cord trauma
- Head trauma
- Musculoskeletal trauma
- Electrical injuries
- Thermal burns
- Cold injury
- Pediatric trauma
- Trauma in pregnant women
- Workshop BLS
- Workshop cervical spine immobilization
- Imaging studies in trauma
- The universal algorithm for adult ECC
- Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
- Pulseless electrical activity (PEA) / asystole algorithm
- Bradycardia treatment algorithm
- Tachycardia Treatment algorithm
- Hypotension / Shock
- Acute myocardial infarction
- Pediatrics Advanced life support
- Defibrillation
- Drugs used in ACLS
- Emergency cardiac pacing
- AED

Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY

UNIT 1: NATURE AND SCOPE OF SOCIOLOGY

Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

UNIT 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social

change,

UNIT 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

UNIT 4: SOCIOLOGY OF INDIA

Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

UNIT 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist

Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system.

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.. C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications

SEMESTER V

| S.No | SUBJECT |
|-------------|--|
| 1 | BASIC AND ADVANCED ULTRASOUND IMAGING – THEORY(UE) |

| | |
|---|--|
| 2 | BASIC AND ADVANCED ULTRASOUND IMAGING – PRACTICAL(UE) |
| 3 | BASIC AND ADVANCE COMPUTED TOMOGRAPHY- THEORY(UE) |
| 4 | BASIC AND ADVANCE COMPUTED TOMOGRAPHY- PRACTICAL(UE) |
| 5 | ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE |

SEMESTER-V

BASIC AND ADVANCED ULTRASOUND IMAGING – THEORY (UE)

OBJECTIVES:

Expected to have basic knowledge on human anatomy , physiology and Basic Positioning in radiography

- To develop in depth knowledge on physics involved in Ultrasound imaging.
- To develop exhaustive ideology of various advanced techniques for ultrasound imaging.

UNIT-I

Ultrasound physics: Ultrasound units, Transducer techniques for imaging different Anatomic areas, Different types of Transducer, Ultrasound artifacts.

UNIT-II

Ultrasound anatomy, Patient Preparation, Biologic effects and safety, Contrast agents in Ultrasound Quantities ultrasound densitometry.

UNIT-III

Doppler physics-Doppler artifacts-doppler techniques-tissue harmonic imaging, seascape imaging-Hybrid Imaging-Thermography

UNIT-IV

3D and 4D Ultrasound Imaging, patient preparation for Doppler, Vascular sonography

UNIT-V

Musculoskeletal sonography, basic echocardiography, interventional sonography, intra-operative sonography.

Text Books:

1. Diagnostic Ultrasound, Carol M. Rumack, 4th edition, Elsevier/Mosby, 2011.
2. Clinical Doppler Ultrasound Paul L. Allan, 3rd edition, Elsevier Health Sciences, 2013.

Reference Books:

1. Diagnostic Ultrasound, Carol M. Rumack, 4th edition, Elsevier/Mosby, 2011.
2. Clinical Doppler Ultrasound Paul L. Allan, 3rd edition, Elsevier Health Sciences, 2013.

Specific Learning Outcome (SLO):

- Learn the basics of ultrasound, principles, tools and accessories and advancements in ultrasound techniques and imaging
- Learn the advanced techniques used for ultrasound imaging of various organs.
- Acquire knowledge on troubleshooting of the ultrasound imaging equipment.

BASIC AND ADVANCED ULTRASOUND
IMAGING PRACTICAL (UE)

OBJECTIVES:

Expected to have basic knowledge on anatomy, pathology and basic physics of ultrasound imaging

- To inculcate knowledge on various ultrasound imaging techniques.
- To elaborate on Advanced Ultrasound imaging techniques.

CONTENTS:

- USG abdominal imaging.
- USG Neck imaging
- Doppler evaluation
- Advanced Ultrasound Imaging
- Spotter / Image discussion

Specific Learning Outcome (SLO):

- Learn various skills in ultrasound imaging techniques
- Acquire competency in handling patients for Doppler studies.
- Learn the importance of quality assurance and troubleshooting Ultrasound equipment

BASIC AND ADVANCED COMPUTED TOMOGRAPHY
THEORY (UE)

OBJECTIVES:

Expected to have basic knowledge on human anatomy, physiology and basic positioning in radiography.

- To inculcate knowledge on Physics and instrumentation of CT.
- To elaborate on various procedures and protocols in CT imaging.

UNIT-I

- Basic principle of CT scan, Generation of CT, Image formation in CT, Image quality, Hounsfield
- Detectors used in CT, X-ray tube.
- Patient preparation, Imaging techniques for Head, Chest, Abdomen and other parts

UNIT-II

- Contrast media in CT scan, Artifacts in CT, Image documentation, Safety regulation

UNIT-III

- Basics of spiral CT scan, advantages of spiral CT scan, Electron beam CT, patient preparation-CT (aortogram, selective angiogram head, neck and peripheral angiography).

UNIT-IV

- 3D processing and reconstruction-Different Rendering mode used in 3D Reconstruction-HRCT-image documentation-image filing-documental maintenance.

Text Books:

1. Computed Tomography: Physical Principles, Clinical Applications, and Quality Control, Euclid Seeram, 4th edition, Elsevier Health Sciences, 2015

Reference Books:

2. Computed Tomography - Essentials of medical imaging series, Stewart C. Bushong, illustrated edition, McGraw Hill Professional, 2000

Specific Learning Outcome (SLO):

- Learn the physics and instrumentation involved in CT imaging.
- Acquire competency in handling patients for various CT imaging studies.
- Gain knowledge of advanced techniques in CT imaging.

**BASIC AND ADVANCED COMPUTED TOMOGRAPHY –
PRACTICAL (UE)**

OBJECTIVES:

Expected to have basic knowledge on anatomy, pathology and

Positioning.

- To inculcate knowledge on basic CT imaging protocols and parameters involved.
 - To elaborate on the CT imaging techniques and protocols to diagnose various diseases.
1. Brain scanning Protocol
 2. CT Chest scanning Protocol
 3. CT Abdomen scanning Protocol
 4. CT Angiography Protocol
 5. Image processing in workstation
 6. CT Biopsy Protocol

Specific Learning Outcome (SLO):

- Learn instrumentation, physics and handling of the CT equipment.
- Demonstrate competency in handling patients in various CT imaging protocols.
- Learn to support in diagnosis based on post processing the CT images.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

Natural Resources: Introduction, Multi-disciplinary nature of environmental studies,

Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging, and salinity, Energy Resources.

Ecosystems: Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

Pollution: Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

Social Issues Human, Population and Environment: From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

Concept of health & disease: Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation – Natural history of disease – Iceberg phenomenon-concept of control- concept of prevention-Modes of Intervention, Changing pattern of disease.

Epidemiology: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT-

Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

Environmental & health: Definition & Components (environment sanitation environmental sanitation) Water: Safe & wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1). Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution Ventilation: Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

SEMESTER VI

| S.no | SUBJECT |
|-------------|---|
| 1 | BASICS AND ADVANCED MRI - THEORY(UE) |
| 2 | BASICS AND ADVANCED MRI - PRACTICAL(UE) |
| 3 | INTERVENTIONAL RADIOLOGICAL PROCEDURES AND BASIC ANGIOGRAPHY – THEORY (UE) |
| 4 | INTERVENTIONAL RADIOLOGICAL PROCEDURES AND BASIC ANGIOGRAPHY – PRACTICAL(UE) |
| 5 | HEALTHCARE AND BASIC PRINCIPLES |

SEMESTER-VI

BASICS AND ADVANCED MRI - THEORY (UE)

OBJECTIVES:

Expected to have basic knowledge on human anatomy , physiology and Basic Positioning in radiography

- To inculcate knowledge on Physics and instrumentation of MRI.
- To elaborate on various procedures and protocols in MR imaging.

UNIT-I

Basic principle and concepts of MRI, the need for MRI, Role of hydrogen in MR Imaging
Advantages and disadvantages of MRI,

UNIT-II

MRI architecture, magnet system and gradient system

UNIT-III

Patient screening before scanning, safety aspects

UNIT-IV

Types of magnets and RF coils, different types of pulse sequence, Fourier transformation, Inverse Fourier transformation, and K space imaging Image formation in MRI with & without gating image formation in MRI, maintaining image quality

UNIT-V

MR Angiography, (dynamic contrast MR angiography, phase contrast and TOF) Functional MRI, MR Spectroscopy, Recent advances in MRI and open MRI.

Text Books:

1.MRI in Practice, Catherine Westbrook, Carolyn Kaut Roth, John Talbot, 4th edition, John Wiley & Sons, 2011.

Reference Books:

2.Magnetic Resonance Imaging, Volume 1, David D. Stark, William G. Bradley, 3rd edition, Mosby, 1999.

Specific Learning Outcome (SLO):

- Learn in detail about MRI physics and instrumentation.
- Demonstrate competency in handling patients for various MR imaging studies at an advanced level.
- Acquire research ideas in MR imaging with knowledge of advanced techniques in MR imaging.

BASICS AND ADVANCED MRI - PRACTICAL (UE)

OBJECTIVES:

Expected to have basic knowledge on anatomy, pathology and positioning.

1. To inculcate knowledge on Physics of MR imaging systems.
To elaborate on the MR imaging techniques and protocols to diagnose various
2. diseases.
 - MRI Brain screening Protocol demonstration
 - MRI Spine screening Protocol
 - MRI Angiography Protocol
 - MRI Musculoskeletal screening Protocol
 - Image processing in work station.
 - MR Advanced imaging Protocol

Specific Learning Outcome (SLO):

- Learn to identify the MRI equipment structure, physics and handling.
- Demonstrate the competency in handling patients in various MRI imaging protocols.
- Learn to support in diagnosis based on MRI imaging protocols.

INTERVENTIONAL RADIOLOGICAL PROCEDURES AND BASIC ANGIOGRAPHY – THEORY (UE)

OBJECTIVES:

Expected to have basic knowledge on Radiological anatomy, physiology and Basic Positioning in radiography

- To introduce the importance of Patient care and responsibilities of Technologist in Healthcare industry.
- To introduce various interventional radiology techniques and protocols.

UNIT-I

Procedure of image guided biopsies and drainage procedure

UNIT-II

Invasive Angiography and Venography, 4 Vessel DSA, Aortogram, Selective Angiogram, Venogram

UNIT-III

Invasive Monitoring, Cardiac resuscitation measures, Plethysmography, Interventional Procedures, PTBD, Stenting, Management of shock, PTA + Stenting, stent graft, Embolisation Tips, drainage procedure.

UNIT-IV

Embolisation, GDC, Glue embolisation, Vertebroplasty, Direct puncture, Laser guided procedures, Adult and Pediatric Invasive Cardiology.

UNIT-V

Basics of cardiac catheterization, Coronary angiogram, Cardiac interventional procedures

Reference Books:

- Interventional Radiology: A Practical Guide Radcliffe Series, Anthony F. Watkinson, Andy Adam, illustrated edition,
- Radcliffe Publishing, 1996

Specific Learning Outcome (SLO):

- Learn to handle patients with care and responsibilities.
- Develop competency and support radiologist in various interventional radiology protocols.

Acquire knowledge in assurance of quality in cathlab with basic knowledge of various safety considerations and quality assurance test

**INTERVENTIONAL RADIOLOGICAL PROCEDURES AND
BASIC ANGIOGRAPHY – PRACTICAL (UE)**

OBJECTIVES:

Expected to have basic knowledge on Radiological anatomy, physiology and Basic Positioning in radiography

- To introduce the importance of Patient care and responsibilities of Technologist in Healthcare industry
- To introduce various interventional radiology techniques and protocols.
 - Catheter Intervention Procedures Protocol
 - Equipment handling
 - Image guided interventional procedure Protocol
 - Image processing in work station

Specific Learning Outcome (SLO):

- Learn to handle patients with care and responsibilities in a cathlab.
- Demonstrate competency in supporting radiologists in various interventional radiology techniques.
- Learn to express support in diagnosis and treatment based on interventional radiology protocols.

HEALTH CARE MANAGEMENT

1. Concept of Health Care and Health Policy

- Health in Medical Care

- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

2. Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

3. Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

7. Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

8. Health Insurance

SEMESTER VII

| S.no | SUBJECT |
|-------------|-------------------------------------|
| 1 | PROJECT AND DISSERTATION |
| 2 | STATISTICS AND RESEARCH METHODOLOGY |

SEMESTER-VII
BIO-MEDICAL STATISTICS AND RESEARCH METHODOLOGY

1. What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences.
2. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
3. Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
4. Cumulative frequency curve – Ogives – Drawing inference from graph.
5. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
6. Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
7. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.
8. Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
9. Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
10. Tests of significance- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -6 months



**Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY**

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B.Sc. CARDIAC CARE TECHNOLOGY

**Regulations, Curriculum and Syllabus
2018**



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.
- b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks

DURATION -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

| | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- 40% minimum in the University End-Semester Theory examination
- 40% minimum in the University End-Semester Practical examination
- 40% of marks in the subject where internal evaluation alone is conducted
- 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.

- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (CARDIAC CARE TECHNOLOGY)**TOTAL HOURS : 420**

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy and Physiology Related to cardiac care technology- Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Anatomy and Physiology Related to cardiac care technology- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Pharmacology related to cardiac care technology - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Pharmacology related to cardiac care technology - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Medical Ethics and Bio safety(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (CARDIAC CARE TECHNOLOGY)

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Pathology related to cardiac care technology paper I– Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Pathology related to cardiac care technology paper I – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Pathology related to cardiac care technology paper II – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Pathology related to cardiac care technology paper II – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Basic and Advanced Life support(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Medical Sociology(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (CARDIAC CARE TECHNOLOGY)

TOTAL HOURS : 390

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Electrocardiography related to cardiac care technology paper I-Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Electrocardiography related to cardiac care technology paper I - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Electrocardiography related to cardiac care technology paper II -Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Electrocardiography related to cardiac care technology paper II - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Environmental science and Community medicine-Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (CARDIAC CARE TECHNOLOGY)

TOTAL HOURS: 390

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper I- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper I - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper II- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper 11 - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Health care and basic principles (IE) | 30 hours | - | | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|--|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| | | | | | | | | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Bio-Statistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi
- c. Biceps
- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye ballSS

6. Viva Voce

- a. Radiology – Xrays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure,classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic.Blood and body fluids

- Body fluid volumes,compartments,and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration,Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II.Estimation of Hemoglobin

III.RBC

IV.WBC

V.Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.

- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents**Unit I:**

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE**1. Gram staining****2. Spotters:**

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM

- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahlihemocytometer
- Neubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**
 - Pituitary gland
 - Pineal body
 - Thyroid & parathyroid gland
 - Adrenal
 - Pancreas
 - Gonads – Ovary & Testis
- **Cardio-Vascular System**
 - Heart
- **Lymphatic system**
 - Spleen
- **Respiratory System**
 - Lungs
 - Larynx
 - Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Saggital section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicals
- Vas deferens
- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition, normal values, intrapulmonary and intrapleural pressures, surfactant.
- Oxygen transport, carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia, cyanosis, Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,

- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope

5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis

-Renal cell carcinoma(RCC)

-Renal Failure

6. REPRODUCTIVE SYSTEM

-Diseases of testis, uterus, cervix and ovary

7. CNS

-Infections

8. BONES and JOINTS

-Septic Arthritis

-Osteomyelitis

-Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC

- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE**Learning Objective**

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body- A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers

- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER III

SEMESTER – III

ANATOMY AND PHYSIOLOGY RELATED TO CARDIAC CARE TECHNOLOGY- THEORY (UE)

Course description:

- This course will provide an outline of Anatomy and physiology to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

- At the end of the course the students should be able to:
- Describe the structure of the cardiovascular system of the human body.
- Define and describe basic physiological process governing the normal functioning of the human heart.

Learning objective skills:

- Identify the anatomical structure of the human heart.
- Learn to correlate the physiological functions.

UNIT- I:

- Anatomy of the heart and great vessels

UNIT II:

- Gross anatomy and structural features of cardiac chambers
 - Atrium
 - Ventricle

- AV junction
 - Heart valves
 - Specialized conduction tissues
- Conduction system
 - Sinus node
 - Internodal tracts
 - AV node
 - Bundle of His
- Systemic circulation
 - Arterial system
 - Venous system
 - Lymphatic system
 - Tissue perfusion and microcirculation
- Pulmonary circulation
 - Pulmonary artery
 - Pulmonary veins
 - Bronchial artery
- Cerebral circulation
- Renal circulation

UNIT- III:

1. Innervations of the heart
 - Sympathetic
 - Parasympathetic
 - Sensory
2. coronary vascular system
 - Coronary arteries
 - Myocardial capillary bed
 - Venous drainage
 - Lymphatic drainage
3. Pericardium
4. Cardiac cycle
 - Mechanical events
 - Arterial cycle and central venous pressure cycle
 - Clinical aspects of human cardiac cycle
 - Heart sounds
5. Cardiac output
 - Assessment of cardiac output
 - Ficks principle
 - Thermal dilution and indicator dilution methods

- Pulse Doppler method
- Miscellaneous methods

UNIT-IV:

- Anatomy of Respiratory System
 - Mechanism of respiration
 - Principles of gas exchange regulation for respiration
- Cardiac excitation and contraction
 - Mechanism of contraction
 - Pacemaker of conduction system
 - Nodal electricity
 - Nervous control of the heart rate
- Vascular smooth muscle
 - Mechanism of contraction
 - Pharmacomechanical coupling, automaticity

UNIT-V:

Cardiovascular responses in pathological situations

- Shock and hemorrhage
- Syncope
- Essential hypertension
- Chronic cardiac failure

UNIT-VI:

Hematology and coagulation physiology of blood components

- Blood groups
- Blood transfusion
- Hemostasis

RECOMMENDED BOOKS:

ANATOMY:

1. B D Chaurasia: General human anatomy
2. Richard S.Snell: clinical anatomy, Manipal manual for Allied Health Science

PHYSIOLOGY:

1. Essentials of medical physiology, K. Sembulingam, Prema Sembulingam
2. Basics of medical physiology, D. Venkatesh, H.H. Sudhakar
3. Guyton and Hall Textbook of medical physiology, John E. Hall

| S.NO | SUBJECT |
|------|--|
| 1. | Anatomy and Physiology Related to cardiac care technology- Theory(UE) |
| 2. | Anatomy and Physiology Related to cardiac care technology- Practical (UE) |
| 3. | Pharmacology related to cardiac care technology - Theory (UE) |
| 4. | Pharmacology related to cardiac care technology - Practical (UE) |
| 5. | Medical Ethics and Bio safety(IE) |
| 6. | Psychology (IE) |

ANATOMY AND PHYSIOLOGY RELATED TO CARDIAC CARE TECHNOLOGY- PRACTICAL(UE)

Learning objective:

- Expected to describe the structure of the cardiovascular system of the human body.
- Define and describe basic physiological process governing the normal functioning of the human heart.
- To know the pharmacological actions and mechanism of action of cardiovascular drugs used for different disease conditions.

ANATOMY & PHYSIOLOGY:

Charts and Spotters:

- Structural picture of the heart.
- Heart valves
- Conduction system
- Coronary arteries
- Pericardium
- Systemic & pulmonary circulation
- Cardiac cycle
- Cardiac excitation & contraction
- Cardiac output
- Mechanism of respiration

SPECIFIC LEARNING OUTCOME (SLO):

- To gain knowledge on anatomical structures, physiological functions related to the cardiovascular system.

PHARMACOLOGY RELATED TO CARDIAC CARE TECHNOLOGY- THEORY (UE)

Course description:

- This course will provide an outline of pharmacology to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

- At the end of the course the students should be able to:
- Define and describe basic physiological process governing the normal functioning of the human heart.
- To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of cardiovascular drugs.
- To understand the pharmacological actions and mechanism of action of cardiovascular drugs used for different disease conditions.

Learning objective skills:

- To know the therapeutic uses and adverse of the cardiovascular drugs used for different disease conditions.

UNIT-I:

- **Anti Anginal Agents**
 - Beta blocking agents – propranolol, Atenolol, Metoprolol, Labetolol, Pindolol.
 - Nitrates – Nitroglycerine ,Isosorbidedinitrate, Isosorbidemononitrate, transdermal nitrate patches.
 - Calcium Channel blockers – Nifedipine , Verapamil , dilitiazem , new calcium channel blockers.

UNIT II:

- **Anti Failure Agents**

- Diuretics – Furosemide, Thiazide diuretics, other thiazide like agents, Potassium sparing diuretics, combination diuretics, special diuretic problems.
- Angiotensin converting enzyme (ACE) inhibitors
- Types of ACE inhibitors – Captopril, Enalapril, ACE inhibitors for diabetics and hypertensive renal disease.
- Digitalis and acute inotropes – Digoxin, Digitoxin, Dobutamine, Dopamine, Adrenaline, Nonadrenaline, Isoprenaline, Mixed inotropic vasodilators amrinon.

UNIT III:

- **Anti hypertensive drugs**

- Diuretics, beta blockers, Ace inhibitors, calcium antagonists, direct vasodilators, centrally active and peripherally active vasodilators.

UNIT IV:

- **Anti arrhythmic agents**

- Quinidine and related compounds, procainamide, lidocaine, mexiletine, phenytoin, flecainide, amiodarone, bretylium, combination therapy.

UNIT V:

- **Antithrombotic agents**

- Platelet inhibitors
- Aspirin
- Persantine
- Anticoagulants
- Heparin
- Warfarin
- Fibrinolytics
- Streptokinase
- Urokinase
- Combination therapy

UNIT IV

- Lipid lowering and anti atherosclerotic drugs
- Miscellaneous drugs
 - Protamine
 - Emergency drugs
 - Narcotics

- Sedatives
- Antihistamines
- Antibiotics

RECOMMENDED BOOKS:

PHARMACOLOGY:

1. Essentials of medical pharmacology, KD Tripathi
2. Basic and clinical pharmacology, Bertran G Katzung
3. Pharmacology for dental and allied health science, Padmaja Udhayakumar

PHARMACOLOGY RELATED TO CARDIAC CARE TECHNOLOGY- PRACTICAL (UE)

Learning objective:

- Expected to describe the drugs used in the cardiovascular system of the human body.
- Define and describe basic physiological process governing the normal functioning of the human heart.
- To know the pharmacological actions and mechanism of action of cardiovascular drugs used for different disease conditions.

Charts:

- Mechanism of action of drugs and its adverse effect
- Anti Anginal Agents
- Anti Failure Agents
- Anti hypertensive drugs
- Anti arrhythmic agents
- Antithrombotic agents
- Lipid lowering and anti atherosclerotic drugs
- Miscellaneous drugs

Spotters:

- Cardiovascular drugs
- Diuretics
- Angiotensin converting enzyme (ACE) inhibitors
- Digitalis and acute ionotropes
- beta blocking agents
- Nitrates

- Calcium Channel blockers

SPECIFIC LEARNING OUTCOME(SLO):

- To gain knowledge on pharmacological functions, mechanism of action related to the cardiovascular system.

-

MEDICAL ETHICS AND BIO SAFETY(IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tampo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning.Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality.Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006

4. Shelley E. Taylor. "**Health Psychology**"**Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, LathaSathish, "**Psychology for Effective Living**", Department of Psychology, University of Madras.
6. Coleman, James. 1980. "**Abnormal Psychology and modern life**". New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

| S.NO | SUBJECT |
|-------------|--|
| 1. | Pathology related to cardiac care technology paper I– Theory (UE) |
| 2. | Pathology related to cardiac care technology paper I – Practical (UE) |
| 3. | Pathology related to cardiac care technology paper II – Theory(UE) |
| 4. | Pathology related to cardiac care technology paper II – Practical (UE) |
| 5 | Basic and Advanced Life support(IE) |
| 6 | Medical Sociology(IE) |

PATHOLOGY RELATED TO CARDIAC CARE TECHNOLOGY PAPER

I– THEORY (UE)

Course description:

- This course will provide an outline of pathological disease conditions to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

- At the end of the course the students should be able to:
- To describe the pathological disease conditions related to the cardiovascular system.
- To understand the diagnostic procedures and treatmental procedures relevant to the pathological disease condition.

Learning objective skills:

- Learn to correlate the physiological functions and disease conditions

UNIT-I:

- Valvular heart disease
 - Aortic stenosis
 - Aortic regurgitation
 - Mitral stenosis
 - Mitral regurgitation ; mitral valve prolapsed
 - Tricuspid stenosis and regurgitation
 - pulmonary stenosis and regurgitation

UNIT-II:

- Coronary artery disease
 - Types and location of myocardial infarction
 - Surgical treatment; other treatment modalities.

UNIT-III:

- Hypertension
- Heart failure

UNIT-IV:

- Dilated cardiomyopathy
- Hypertrophic cardiomyopathy
- Restrictive cardiomyopathy
- apical cardiomyopathy

UNIT-IV:

- Disease of aorta, Infective endocarditis

RECOMMENDED BOOKS:

1. Cardiology, Desmond G. Julian, J. Campbell Cowan, James M. McLenachan.

PATHOLOGY RELATED TO CARDIAC CARE TECHNOLOGY PAPER I **– PRACTICAL (UE)**

Learning objective:

- To know the pathological disease conditions related to the cardiovascular system.

Charts and Spotters:

- To give demonstration on pathological disease conditions related to cardiovascular system.
- **Valvular heart disease**
 - Aortic stenosis and regurgitation
 - Mitral stenosis and regurgitation ; mitral valve prolapsed
 - Tricuspid stenosis and regurgitation
 - pulmonary stenosis and regurgitation
- **Coronary artery disease**
 - Types and location of myocardial infarction
- **Myocardial disease**
 - Dilated cardiomyopathy
 - Hypertrophic cardiomyopathy
 - Restrictive cardiomyopathy
 - apical cardiomyopathy

SPECIFIC LEARNING OUTCOME:

- To gain knowledge on pathological disease conditions and treatment related to cardiovascular system.

PATHOLOGY RELATED TO CARDIAC CARE TECHNOLOGY PAPER **II– THEORY (UE)**

Course description:

- This course will provide an outline of Pathological disease conditions to improve the students understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

Objectives:

- At the end of the course the students should be able to:
- To describe the pathological disease conditions related to the cardiovascular system.
- To understand the diagnostic procedures and treatmental procedures relevant to the pathological disease condition.

Learning objective skills:

- Learn to correlate the physiological functions and disease conditions

UNIT-I:

- **Cyanotic congenital heart disease**
 - Tetralogy of Fallot
 - Transposition of great arteries
 - Tricuspid atresia
 - Trunkus arteriosus
 - Total anomalous pulmonary venous connection.
 - Double outlet right ventricle

UNIT-II:

- **Acyanotic heart disease**
 - Atrial septal defect
 - Ventricular septal defects
 - Patent ductus arteriosus
 - Coarctation of aorta

UNIT-III:

- Pericardial effusion
- Constrictive pericarditis
- Cardiac tamponade

UNIT-IV:

- Hypertension
 - Pulmonary and systemic hypertension
 - Classification, causes, clinical features, diagnosis, management

UNIT-V:

- Tumors of heart
 - Left atrial myxoma
 - Left atrial thrombus

RECOMMENDED BOOKS:

1. Cardiology, Desmond G. Julian, J. Campbell Cowan, James M. McLennan.

PATHOLOGY RELATED TO CARDIAC CARE TECHNOLOGY
PAPER II – PRACTICAL (UE)

Learning objective:

- To know the pathological disease conditions related to the cardiovascular system.

Charts and Spotters:

- To give demonstration on pathological disease conditions related to cardiovascular system.

Congenital heart disease

- Tetralogy of Fallot
- Transposition of great arteries
- Tricuspid atresia
- Trunkus arteriosus
- Total anomalous pulmonary venous connection.
- Double outlet right ventricle
- Atrial septal defect
- Ventricular septal defects
- Patent ductus arteriosus
- Coarctation of aorta

Pericardial disease

- pericardial effusion
- Constrictive pericarditis
- Cardiac tamponade

SPECIFIC LEARNING OUTCOME:

- To gain knowledge on pathological disease conditions and treatment related to cardiovascular system.

BASIC AND ADVANCED LIFE SUPPORT (IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS, TRIAGE-Primary Survey, Secondary Survey, Airway & Ventilatory management, Shock, Central & peripheral venous access, Thoracic trauma – Tension pneumothorax, Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma, Head trauma, Musculoskeletal trauma, Electrical injuries, Thermal burns, Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support, Defibrillation, Drugs used in ACLS, Emergency cardiac pacing, AED, Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co

6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.

7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER – V

| S.NO | SUBJECT |
|------|--|
| 1. | Electrocardiography related to cardiac care technology paper I-Theory (UE) |
| 2. | Electrocardiography related to cardiac care technology paper I - Practical (UE) |
| 3. | Electrocardiography related to cardiac care technology paper II -Theory(UE) |
| 4 | Electrocardiography related to cardiac care technology paper II - Practical (UE) |
| 5 | Environmental science and Community medicine-Theory (IE) |

ELECTROCARDIOGRAPHY RELATED TO CARDIAC CARE TECHNOLOGY PAPER I– THEORY (UE)

Course description:

- This course will provide an outline of Basic electrocardiogram (ECG)

Objectives:

- At the end of the course the students should be able to
- To develop a knowledge about the diagnostic techniques of basic conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques.

UNIT-I:

- Basic principles
- The electrocardiographic paper,
- The electrical field of heart,
- The leads; standard limb leads; precordial leads; V lead; aVleads, Basic
- Normal ECG
 - The P wave,
 - The QRS complex, T wave;
 - The ST segment
 - Electrical axis of the heart
 - The Q-T interval, PQ interval
 - PR interval and RR interval

UNIT-II:

- **Chamber enlargement**
 - Right atrial enlargement
 - left atrial enlargement
- **Axis deviation**
 - Right Axis deviation
 - left Axis deviation
 - Left ventricular hypertrophy, Right ventricular hypertrophy

UNIT-III

- **Sinus arrhythmias**
 - Sinus rhythm,
 - Sinus bradycardia,

- Sinus tachycardia
- Paroxysmal atrial tachycardia,
- Atrial fibrillation and Atrial flutter,
- Atria ventricular (AV) Nodal rhythm,
- Ventricular tachycardia,
- Ventricular fibrillation
- Ventricular flutter

UNIT-IV:

- Pulse oximeter
- Ventilators
- Arterial blood gas

RECOMMENDED BOOKS:

1. Hand Book of Clinical Electrocardiography, Tapas Kumar Koley, 1st edition, New Central Book Agency (P) LTD
2. An Introduction to Electrocardiography Leo Schamroth, , eighth adapted edition, Wiley India Pvt. Ltd

REFERENCE BOOKS:

1. The ECG made easy, John R. Hampton, eighth edition, Churchill Livingstone

ELECTROCARDIOGRAPHY RELATED TO CARDIAC CARE **TECHNOLOGY PAPER I – PRACTICAL (UE)**

Learning objective:

- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

- ECG spotters of all cardiac disease conditions
- Right atrial enlargement
- left atrial enlargement
- Right Axis deviation
- Left Axis deviation
- Hypertrophy
- Arrhythmias
 - a. Sinus rhythm,
 - b. Sinus bradycardia and tachycardia
 - c. Ventricular tachycardia
 - d. Ventricular flutter
 - e. Ventricular fibrillation
- Pulse oximeter
- ABG

Specific learning outcomes (SLO):

- Will be able to identify and explain the different cardiac rhythms and conduction defects from the given ECG
- Will be able to explain ECG at the risk of cardiovascular emergencies
- Can bring out the mechanism of ECG deflections in pathological situations
- Can easily identify arrhythmias from the given ECG

ELECTROCARDIOGRAPHY RELATED TO CARDIAC CARE **TECHNOLOGY PAPER II THEORY (UE)**

Course description:

- This course will provide an outline of advanced ECG and threadmill stress test.

Objectives:

- At the end of the course the students should be able to:

- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.
- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques

UNIT-I:

- ECG in Coronary artery disease-Myocardial infarction
- QRS changes
 - Evolution of electrocardiographic changes
 - Localization of ischemia or infarction
 - Non-infarction Q waves
- Primary and secondary T wave change

UNIT-II:

HEART BLOCKS

- First degree heart block
- Second degree heart block
- Third degree heart block
- Left anterior fascicular block
- Left posterior fascicular block
- Left bundle branch block
- Right bundle branch block
- Complete heart block

UNIT-III:

- Exercise stress testing- Exercise physiology, Exercise protocols, patient preparation
- Exercise test indications, contra-indications and precautions

UNIT-IV:

- Defibrillator
- Direct Current (DC) shock
- Monophasic and biphasic shock
- Technique and Indications cardioversion

UNIT-V:

- Electrolyte abnormalities related to ECG
 - Hyper kalemia
 - Hypo kalemia

- Hyper calcemia
- Hypo calcemia
- Hypo magnesemia
- Hypo magnesemia
- Pre excitation syndrome
- Defibrillator

Holter Analysis

- Technique ,indication and contra indication
- Guidelines for ambulatory electrocardiography

RECOMMENDED BOOKS:

1. Hand Book of Clinical Electrocardiography, Tapas Kumar Koley,1st edition, New Central Book Agency (P) LTD
2. An Introduction to Electrocardiography LeoSchamroth, , eighth adapted edition,WileyIndiaPv.Ltd

REFERENCE BOOKS:

1. The ECG made easy, John R. Hampton, eighth edition, Churchill Livingstone

ELECTROCARDIOGRAPHY RELATED TO CARDIAC CARE **TECHNOLOGY PAPER II -PRACTICAL(UE)**

Learning objective:

- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.

- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

- Charts and protocol identification in TMT
- ECG spotters of all cardiac disease conditions
- First degree heart block
- Second degree heart block
- Third degree heart block
- Primary and secondary T wave change
- Hyper kalemia
- Hypo kalemia
- Hyper calcemia
- Hypo calcemia
- Hyper magnesemia
- Hypo magnesemia
- Pre excitation syndrome

Specific learning outcomes (slo):

- Will be able to prove the pathological conditions in ecg
- Capable of assisting in non-invasive / invasive procedures
- Will be able to perform treadmill testing at cardiovascular emergencies
- Will be able to use the diagnostic strategies by available proven methods in treadmill testing.

ENVIRONMENTAL SCIENCE AND

COMMUNITY MEDICINE (IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/

pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria

for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

Air pollution & its effects. Prevention & Control of air pollution

Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meterological environment, Housing, Disposal of waste Excreta disposal

RECOMMENDED TEXT BOOKS:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

SEMESTER VI

| S.NO | SUBJECT |
|-------------|---|
| 1. | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper I- Theory (UE) |
| 2. | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper I - Practical (UE) |
| 3. | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper II- Theory (UE) |
| 4 | Echocardiography and basics of cardiac catheterization related to cardiac care technology paper 11 - Practical (UE) |
| 5 | Health care and basic principles (IE) |

SEMESTER – VI

ECHOCARDIOGRAPHY AND BASICS OF CARDIAC CATHETERIZATION

RELATED TO CARDIAC CARE TECHNOLOGY PAPER I – THEORY(UE)

Course description:

- This course will provide an outline of echocardiography and basics of cardiac catheterization related to cardiac care technology.

Objectives:

- At the end of the course the students should be able to:
- To develop a knowledge about the diagnostic techniques in echocardiography
- To develop exhaustive ideology of the interpretation of the imaging techniques in echocardiography

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques

UNIT-I:

- Principles of ultra sound
- 2D echo,B-mode,M-mode
- Doppler echocardiography
- Pulse wave Doppler,continuous wave Doppler
- Continuity equation,
- Views in echocardiography
- Analysing the segments in left ventricle.

UNIT-II:

- **Valvular heart disease**
 - Mitral stenosis and regurgitation
 - Aortic stenosis and regurgitation
 - Tricuspid stenosis and regurgitation
 - Pulmonary stenosis and regurgitation

UNIT-III:

- **Cardiomyopathies:**
 - Dilated Cardiomyopathy
 - Restrictive Cardiomyopathy
 - Hypertrophic Cardiomyopathy
 - Apical Cardiomyopathy

UNIT-IV:

- **Pericardial diseases**
 - Pericardial effusion
 - Cardiac tamponade

- Constrictive pericarditis

UNIT-V:

- Infective endocarditis
- Left atrial thrombus
- Left atrial myxoma

UNIT-IV:

- Dobutamine Stress Echo Cardiography
- Contrast Echo Cardiography

UNIT-V:

- Cardiac catheterization:
 - Type of catheters
 - Techniques of sterilization-advantages and disadvantages of each method preparing up the cardiac catheterization laboratory for a diagnostic study Table movement
 - Intra cardiac pressures
 - Thermo dilution method
 - Oxygen dilution method
 - Principles of oximetry

RECOMMENDED BOOKS:

1. The Echo Manual ,jae K Oh ,third edition ,Lippincott Williams and Wilkins
2. Practice of Clinical Echocardiography Catherine M otto,fourth print Rev edition ,, W.B.Saunders Company

REFERENCE BOOKS:

1. The Echo made easy, Sam kaddoura ,Churchill Livingstone ,second edition
2. Feigenbaum”s echocardiography, William F Armstrong , Thomas Ryan seventh edition,,Wolters Kluwer

ECHOCARDIOGRAPHY AND BASICS OF CARDIAC CATHETERIZATION

RELATED TO CARDIAC CARE TECHNOLOGY PAPER I– PRACTICAL(UE)

Learning objective:

- To develop a knowledge about the diagnostic techniques in echocardiography

- To develop exhaustive ideology of the interpretation of the imaging techniques in echocardiography

Practicals / Demonstration:

- Disease conditions diagnosed by Echocardiogram

Valvular heart disease

- Mitral stenosis and regurgitation
- Aortic stenosis and regurgitation
- Tricuspid stenosis and regurgitation
- Pulmonary stenosis and regurgitation

Cardiomyopathies:

- Dilated Cardiomyopathy
- Restrictive Cardiomyopathy
- Hypertrophic Cardiomyopathy
- Apical Cardiomyopathy

Pericardial diseases

- Pericardial effusion
- cardiac tamponade
- constrictive pericarditis
- Analysis of LV wall segments.

Specific learning outcomes (slo):

- Will be able to identify abnormal conditions in echocardiography
- Will be able to prove the pathological conditions by performing echo
- Capable of assisting in non-invasive / invasive procedures
- Will be able to perform Echocardiography at cardiovascular emergencies
- Will be able to use the diagnostic strategies by available proven methods in echocardiography

ECHOCARDIOGRAPHY AND BASICS OF CARDIAC CATHETERIZATION RELATED TO CARDIAC CARE TECHNOLOGY PAPER II– THEORY(UE)

Course description:

- This course will provide an outline of echocardiography and basic cardiac catheterization.

Objectives:

- At the end of the course the students should be able to:

- To develop a knowledge about the diagnostic techniques in echocardiography
- To develop exhaustive ideology of the interpretation of the imaging techniques in echocardiography

Learning objective skills:

- Learn to diagnosis the abnormalities with interpretation of the imaging techniques

UNIT-I:

- Echocardiographic detection of congenital heart disease:
 - Atrial septal defect
 - Ventricular septal defect
 - Patent ductus arteriosus
 - Coarctation of aorta

UNIT-II:

- Tetralogy of Fallot
- Total anomolus pulmonary venous return
- Tricuspid atresia
- Transposition of great arteries
- Double outlet right ventricle

UNIT-III:

- Elaluation of systolic and diastolic function
- Analysis of regional wall motion abnormailty

UNIT-IV:

- Transesophageal echocardiography
- Disease of aorta

UNIT-V:

- Coronary angiography
- Left Ventriculography – catheters, views, use of the injector
- Right heart catheterization and angiography

RECOMMENDED BOOKS:

1. The Echo Manual ,jae K Oh ,third edition ,Lippincott Williams and Wilkins
2. Practice of Clinical Echocardiography Catherine M otto,fourth print Rev edition ,, W.B.Saunders Company

**ECHOCARDIOGRAPHY BASICS OF CARDIAC CATHETERIZATION RELATED TO
CARDIAC CARE TECHNOLOGY PAPER II — PRACTICAL (UE)**

Learning objective:

- To develop a knowledge about the diagnostic techniques for various conduction abnormalities.

- To develop exhaustive ideology of the interpretation of the imaging techniques for cardiac rhythm and conduction abnormalities

Practicals / Demonstration:

- Disease conditions diagnosed by Echocardiogram
 - Atrial septal defect
 - Ventricular septal defect
 - Patent ductus arteriosus
 - Coarctation of aorta
 - Tetralogy of Fallot
 - Total anomolus pulmonary venous return
 - Tricuspid atresia
 - Transposition of great arteries
 - Double outlet right ventricle
 - Analysis of LV wall segments.
 - Analysis of regional wall motion abnormality

Specific learning outcomes (slo):

- Will be able to identify abnormal conditions in echocardiography
- Will be able to prove the pathological conditions by performing echo
- Capable of assisting in non-invasive / invasive procedures
- Will be able to perform Echocardiography at cardiovascular emergencies
- Will be able to use the diagnostic strategies by available proven methods in echocardiography

HEALTH CARE AND BASIC PRINCIPLES (IE)

UNIT-I Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

UNIT-II . Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

UNIT-III Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

UNIT-IV Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

UNIT-V. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

UNIT-VI. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

UNIT-VII Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

UNIT-VIII Health Insurance

REFERENCE BOOKS:

1. Principles of Hospital Administration and Planning, BM Sakharkar, 2nd edition, Jaypee Brothers, Medical Publishers Pvt. Limited, 2008
2. Hospital Administration And Management : Theory And Practice, R. Kumar S.L. Goel, Deep and Deep Publications, 2007
3. Principles of Management, Mason Andrew Carpenter, Talya Bauer, 3rd edition, Flat World Knowledge, L.L.C., 2010

SEMESTER-VII

| S.NO | SUBJECT |
|------|--|
| 1 | Project/ Dissertation |
| 2 | BioStatistics and Research methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

UNIT-I Statistics Definition and Terms

- What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability :

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution :

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation :

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK Mahajan Jaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S Sundar Rao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publications pvt ltd, 2008
4. Introductory Statistics. Prem S.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences, Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical speciality. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2018-2019. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
- i) Physics, Chemistry, Biology,
 - ii) Physics, Chemistry, Botany and Zoology
 - iii) Physics, Chemistry, Biology, biochemistry
 - iv) Physics, Chemistry, Biology, nutrition dietetics

b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the B.Sc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing

Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Basic Nutrition, Physiology, Biochemistry, Food Microbiology, Family Meal Management, Diet Therapy, Quantity Food Production, Advance Nutrition, English and Communication skills and Introduction to Computer Science.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective speciality.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80% attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN-

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY

MARKS- 60 Marks

DURATION -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

Theory 20 Marks

Practical 5 Marks

TOTAL

100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

Based on CAT Exams (I,II,III & Model)

20 marks

TOTAL

100 Marks

Practicals Pattern

80 marks

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

20 marks

- Attendance
- Based on CAT exams
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- 40% minimum in the University End-Semester Theory examination
- 40% minimum in the University End-Semester Practical examination
- 40% of marks in the subject where internal evaluation alone is conducted
- 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)

3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE**(Deemed to be university)****FACULTY OF ALLIED HEALTH SCIENCES****SCHEME OF EXAMINATION****Semester–I****(B.Sc., CLINICAL NUTRITION AND DIETETICS)****TOTAL HOURS – 330 HRS**

| S. No | PAPER | Hours per semester | | Evaluation (Marks) | | | | |
|-------|--------------------------------|--------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | | | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | Theory | Practical | Theory | Practical | Theory | Practical | |
| 1 | Basic Nutrition (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 2 | Physiology –I (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 3 | Biochemistry –I (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 4 | Food Microbiology –I (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 5 | Family Meal Management –I (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 6 | English (IE) | 30 hours | - | - | - | 50 | - | 50 |

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|----|-----------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester-II

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

TOTAL HOURS – 330 HRS

| S. No | PAPER | Hours per semester | | Evaluation (Marks) | | | | |
|-------|---------------------------------|--------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | | | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | Theory | Practical | Theory | Practical | Theory | Practical | |
| 1 | Diet Therapy (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 2 | Physiology –II (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 3 | Biochemistry –II (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 4 | Food Microbiology –II (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 5 | Family Meal Management –II (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 6 | Quantity Food Production (UE) | 40 hours | 20 hours | 20 | 05 | 60 | 15 | 100 |
| 7 | Advance Nutrition (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 8 | Computer Science (IE) | 30 hours | - | - | - | 50 | - | 50 |

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|-----------|------------------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–III

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|------------------------------------|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Lecture | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Basic Dietetics (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 2. | Basic Dietetics- practical(UE) | - | 120 | - | 20 | - | 80 | 100 |
| 3. | Food science - Theory (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 4. | Food science - Practical(UE) | - | 120 | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics and Bio safety (IE) | 30 | - | - | - | 50 | - | 50 |
| 6. | Psychology(IE) | 30 | - | - | - | 50 | - | 50 |

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| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester-IV

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--------------------------------------|------------------|-----------|--------------------------------------|-----------|---|-----------|-------|
| | | Lecture | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Advanced Dietetics (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 2. | Advanced Dietetics Practical(UE) | - | 120 | - | 20 | - | 80 | 100 |
| 3. | Personnel Management - Theory (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 4. | Personnel Management - Practical(UE) | - | 120 | - | 20 | - | 80 | 100 |
| 5. | Basics And Advanced Life Support(IE) | 30 | - | - | - | - | 50 | 50 |
| 6. | Medical Sociology(IE) | 30 | - | - | - | - | 50 | 50 |

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|-----------|------------------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE**(Deemed to be university)****FACULTY OF ALLIED HEALTH SCIENCES****SCHEME OF EXAMINATION****Semester–V****(B.Sc., CLINICAL NUTRITION AND DIETETICS)****Total Hours: 390 Hrs**

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical Nutrition I- (UE) | 60 | | 20 | | 80 | | 100 |
| 2. | Clinical Nutrition I - Practicals (UE) | | 120 | | 20 | | 80 | 100 |
| 3. | Community nutrition (UE) | 60 | | 20 | | 80 | | 100 |
| 4. | Community Nutrition-Practicals (UE) | | 120 | | 20 | | 80 | 100 |
| 5. | Environmental Science And Community Medicine (IE) | 30 | | | | 50 | | 50 |

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|----|-----------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–VI

(B.Sc., CLINICAL NUTRITION AND DIETETICS)

Total Hours: 390 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical Nutrition II - Theory (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 2. | Clinical Nutrition II -Practical (UE) | - | 180 | - | 20 | - | 80 | 100 |
| 3. | Dietetics and Counseling- Theory (UE) | 60 | - | 20 | - | 80 | - | 100 |
| 4. | Dietetics and Counseling-Practical (UE) | - | 180 | - | 20 | - | 80 | 100 |
| 5. | Healthcare and Basic principles (IE) | 30 | - | - | - | 50 | - | 50 |

| | |
|----|-----------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

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FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

Semester–VII

Project/Dissertation

| S.No | PAPER | Hours / Semester | | | | |
|------|---|------------------|-----------|-----------------------------------|------|----------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | Ex |
| | | | | Project | Viva | Ex |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 10 |
| 2. | Statistics and research methodology(IE) | 30 | - | - | - | Th 50 |

| | |
|----|-----------------------|
| UE | University Exams |
| IE | Internal Examinations |

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1YEAR

SEMESTER I

| S.No | SUBJECT |
|-------------|---------------------------------|
| 1 | BASIC NUTRITION (UE) |
| 2 | PHYSIOLOGY-I(UE) |
| 3 | BIOCHEMISTRY- I (UE) |
| 4 | FOOD MICROBIOLOGY –I (UE) |
| 5 | FAMILY MEAL MANAGEMENT – I (UE) |
| 6 | ENGLISH(IE) |

SEMESTER – I
BASIC NUTRITION (UE)

OBJECTIVES

To enable the students to:

- To understand the relation between nutrition and health.
- To acquire knowledge about the main nutrients and its functions in the body.
- To understand the modifications in nutrient and dietary requirement for various diseases.

UNIT-I

- Introduction to Nutrition: Health, Food, Functions of food, Nutrients, Nutrition, Scope of Nutrition, Health, Nutrients, Nutritional status, Visible symptoms of good health, Malnutrition.

UNIT-II

- Carbohydrates: Composition, Classification, functions, Sources, digestion, absorption and transport. Components of dietary fibre, Role of fiber in health and disease.
- Protein: Composition, classification, functions, sources, requirements, digestion, absorption and transport, protein quality evaluation.
- Lipids: Composition, Classification, functions, sources, requirements, digestion, absorption and transport.

UNIT-III

- Water and Electrolytes: Water, Sodium, Potassium: Distribution of water and Electrolytes, Functions, Sources, Requirements, Water balance, Maintenance of water balance, Water depletion, Water excess, Distribution of Electrolytes, Maintenance of Electrolyte balance.

UNIT IV

- Energy: Unit of energy, sources, determination of energy expenditure, energy value of foods, Measurement of total energy requirement, Resting energy expenditure, Physical Activity Level (PAL), Factors affecting PAL, Basal Metabolic Rate, determination of BMR, SDA.

PRACTICALS

- 1) Planning and Nutritive value calculation and preparation of macro nutrient rich dishes
 - a. Carbohydrate- Starch, Fiber
 - b. Protein
 - c. Fat
- 2) Planning and Nutritive value calculation and preparation of micro nutrient rich dishes
 - a. Vitamins- Vitamin A, Vitamin C, Thiamine, Riboflavin and Niacin
 - b. Minerals- Calcium, Iron, Zinc, Phosphorus, Potassium

Recommended book

1. Modern Nutrition in Health and Disease 10th edition by Maurice E. Shils
2. Robinson. Basic Nutrition And Diet Therapy (8th Edition)
3. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
4. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

PHYSIOLOGY-I

OBJECTIVES OF THE COURSE:

At the end of this course the students should be able to:

- Comprehend basic terminologies used in the field of Human Physiology
- Define and describe basic Physiological processes governing the normal functioning of the human body.
- Apply this knowledge in their Allied Health Science practice.

CONTENTS

UNIT I

General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Nerve and muscle

- Nerve structure, classification of nerve fibers,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Blood and body fluids

- Body fluid volumes,compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes –Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

UNIT II

Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice- composition, functions and regulation of pancreatic juice.
- Bile- composition, functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE

- Microscope
- Estimation of Hemoglobin
- RBC
- WBC
- Spotters

Recommended book

1. Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

1. Medical physiology for under graduates by Indhu Khurana,
2. Text Book of Physiology by A.K. Jain for BDS.

BIOCHEMISTRY-I(UE)**OBJECTIVES:**

At the end of this course the students should be able to:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids

- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests

CONTENTS

UNIT I - CARBOHYDRATES

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates:

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics:

- Importance of ATP, Outline of respiratory chain.

UNIT II - LIPIDS

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids:

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III – VITAMINS

Vitamins, its classification

- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

- Definition,
 - Classification,
 - Coenzymes,
- Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

1. Reactions of Glucose
2. Reactions of Fructose
3. Reactions of Maltose
4. Reactions of Lactose
5. Tests for Sucrose
6. Tests for Starch
7. Identification of unknown Carbohydrates

SPOTTERS

- **CRYSTALS**
 - Maltosazone
 - Lactosazone
 - Glucosazone/Fructosazone
- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent
- **CHEMICALS**
 - Sodium Acetate
 - Phenylhydrazine
 - α Naphthol
- **STRUCTURES.**
 - Structure of Cholesterol
 - Structure of Glucose
 - Structure of Fructose
- **VITAMINS**
 - Carrots
 - Rickets
 - Scurvy
 - Egg

Text books Recommended :

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books :

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

FOOD MICROBIOLOGY- I (UE)

OBJECTIVES:

At the end of the semester the students should be able to

- Understand the basic concepts of food microbiology.
- Understand the basic fundamental aspect of food microbiology and study the common disease caused by them.

UNIT I

Food Microbiology

- Introduction to food microbiology and its relevance to everyday life - General characteristics of Bacteria, Fungi, Virus, Protozoa & Algae.

Growth of micro-organisms

- Growth curve, effect of environmental factors in growth of micro organism- pH, water activity, oxygen availability, temperature and others.

UNIT II

Primary sources of micro organisms in foods

- Physical and chemical methods used in the destruction of micro organisms, pasteurization and sterilization

UNIT III

Fundamentals of control of micro-organisms in foods

- Extrinsic & intrinsic parameters affecting growth and survival of organisms.
- Use of high & low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation and use of preservatives in food.

PRACTICALS

SPOTTERS

1. Study of equipments in a microbiology lab.
2. Identification of culture media.
3. Gram staining
4. Identifications of important moulds & yeast in food items.

RECOMMENDED BOOK:

1. William. C. Frazier – Food Microbiology

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Subhash Chandra Parija – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,Satish Patwardhan – Handbook of Practical examination in Microbiology

FAMILY MEAL MANAGEMENT I (UE)

OBJECTIVES:

To enable students to:

- Learn the principles of meal planning
- Acquire knowledge on planning meals for different age groups

UNIT I

Menu Planning

- Balanced Diet, Food groups, Food guide, food pyramid, My Plate, Low cost balanced diets RDA, Basic principles of menu planning, Points to be considered while planning menu.

UNIT II

Nutrition in pregnancy

- Physiological changes, Relationship between maternal and foetal nutrition, Impact of nutritional deficiency on the outcome of pregnancy, Nutritional and food requirements, Dietary guidelines, Dietary problems, Complications of pregnancy, GDM.

UNIT III

Nutrition during Lactation

- Physiology of lactation, Hormonal control of lactation, Let Down Reflex, Nutritional and food requirements, Factors affecting volume & Composition of breast milk, Breast feeding and its advantages, Pre-term milk (PTM), Expressed Breast Milk (EBM), Drip Breast Milk (DBM), Common problems during breast feeding.

UNIT IV

Nutrition during Infancy

- Growth & development, LBW, Small for Gestational Age and Pre term baby, Nutritional requirements, Artificial feeding, Hazards of Bottle feeding, Feeding of the Preterm and LBW babies, Weaning, Feeding problems in weaning, Family Pot Feeding, Low cost supplementary foods, ARF.

PRACTICAL

1. Basic principles of meal and menu planning.
2. Daily food guide – Basic five food groups, food pyramid, my plate, use of food groups, food costing.
3. Plan and prepare a diet for Sedentary pregnant woman, Lactating mother (0 – 6 months) and
4. Infant (0 – 6 months). Prepare weaning foods.

RECOMMENDED BOOK:

1. Nutrition and Diet Therapy Corroll lutz & Karen Przytulski Japee, 14Th edition
2. Therapeutic Paediatric Nutrition Madhu Sharma Japee, 1st edition, 2011
3. Diet Management Rekha Sharma Elsevier, 4th edition, 2011
4. Food and Nutrition L.C.Gupta, Kusum Gupta, Abhishek Gupta Japee, 6th edition, 2010
5. Nutrition and Therapeutic Diets Darshan Sohi Japee, 1st edition, 2013

REFERENCE BOOKS:

1. Nutritive Value of Indian Foods C.Gopalan, B.V.Rama Sastri and S.C.Balasubramanian Japee, 1st edition, 1971
2. Food and Nutrition Dr.Shrinandan Bansal AITB, 2nd edition, 2012

ENGLISH (IE)

GENERAL OBJECTIVES:

At the end of the semester the students should be able to

- To improve comprehensive and writing skills in English
- To discuss about effective communication skills
- To prevent barriers in communication.

Unit I: Grammar

- Components of a sentence
- Positive and Negative statements
- Interrogative Statement
- Parts of speech in brief
- Transformation and synthesis of sentences
- Verb and Tense forms
- Voice
- Reported Speech
- Common errors and how to avoid them

Unit II: Vocabulary

- Medical Terminology
- Words often confused or misused
- Words and expression in British and American English
- Idioms and Phrases

Unit III: Oral communication

- Importance of speaking efficiently
- Voice culture
- Preparation of Speech
- Secrets of good delivery
- Audience Psychology

- Presentation Skills
- Using non-verbal communication
- Interview technique
- Skill in arguing

Unit IV: Spoken English

- The phonetic symbols
- Stress
- Intonation
- Rhythm
- Transcription
- Using dictionaries for learning to pronounce

Unit V: Written communication

(a) Art of writing

- Rules for effective writing
- Expansion of proverbs & Ideas
- Précis writing

(b) Letter writing

- Private letters & Social letters
- Business letters
- Letter to a Bank
- Letter to a Newspaper
- Letter to Application
- Curriculum Vitae (Different models)
- Placing an order

(c) Report writing

- Guidelines to prepare a good report
- Usage of impersonal language
- Preparing lab reports

(d) Note making and Note taking

- Note making and note taking strategies
- Organizing notes
- Exercise and note making / taking

(e) Comprehension

- Listening and reading comprehension
(Exercise of prescribed short answers)

Unit VI: Reading

- What is efficient and fast reading?
- Awareness of existing reading habits
- Tested techniques for improving speed
- Improving concentration and comprehension through systematic study.

Reference Books:

1. English for Competitive Examinations by R.P.Bhatnagar, Rajiel Bhargava
2. English for college and competitive exams by Dyvadatham
3. Written Communication in English by Sarah Freeman
4. Writing with a purpose by Tickoo & Sasikumar
5. English phonetics for Beginners by P.Iyadurai
7. Empowerment through verbs & idioms by Padmini devkumar
8. High School English Grammer and Composition by Wren & Martin
9. Communication techniques for your success everywhere by Muralidharan.

SEMESTER II

| S.No | Subject |
|------|-------------------------------|
| 1. | Diet Therapy (UE) |
| 2. | Physiology –II (UE) |
| 3. | Biochemistry II (UE) |
| 4 | Food Microbiology – II(UE) |
| 5. | Family Meal Management-II(UE) |
| 6. | Quantity Food Production (UE) |
| 7. | Advanced Nutrition(IE) |
| 8. | Computer science (IE) |

SEMESTER – II

DIET THERAPY (UE)

OBJECTIVES

To enable the students to:

- Study the aetiology, symptoms and medical nutrition therapy in various diseases
- Learn how to plan and prepare diet for various diseases.
- To acquire knowledge regarding effect of various diseases on nutritional status and nutrient requirements.

UNIT- I

INTRODUCTION TO DIET THERAPY

- Glycemic Index
- Dietary Supplements
- Diet and Inflammation
- Prebiotics & Probiotics
- Artificial Sweeteners
- Food, Nutrition and Drug Interaction
- Personalized Nutrition.

UNIT II

THE DIETITIAN

- Classification,
- Ethics & Responsibilities
- Responsibilities of Specific Dietitians
- Indian Dietetic Association

UNIT III

THERAPEUTIC DIETS

- Immuno Nutrition
- Routine Hospital Diets

- Nutrition Support Service
- Malnutrition In Hospitalized Patients
- Nutrition And Wound Healing.
- Summary of Therapeutic Diet.

PRACTICALS

1. GI foods
2. Anti-Inflammatory food pyramid
3. Prebiotics and probiotics
4. Artificial sweeteners
5. Routine Hospital Diets
6. Nutrition support service
7. Therapeutic diet
8. Spotters
9. Charts

Recommended books

1. Bamji et al. 1996. Text Book of Human Nutrition. New Delhi, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Devlin. T.M. 1997. Text book of Clinical Biochemistry. New York, John Wiley and Sons.
3. Harper. H.A. 1997. Review of Physiological Chemistry. 21st edition. Los Angeles, Lange Medical Publications.
4. Leninger. A. L. 1992. The molecular basic of cell structure and functions. New Delhi, Kalyani Publishers.

PHYSIOLOGY-II (UE)

OBJECTIVES:

- To develop vocabulary for appropriate terminologies to effectively communicate terms related to physiology of various body systems
- To identify and describe physiological functions of various structures involved in smooth functioning of the body.

Unit I Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -II Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit –III Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition,normal values,intrapulmonary and intra pleural pressures,surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis,Artificial Respiration.

Unit – IV Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – V Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VI Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

Recommended book

- Basics of Medical Physiology (Third edition) by D. Venkatesh/ H.H. Sudhakar

Reference books

- Medical physiology for under graduates by Indhu Khurana,
- Text Book of Physiology by A.K. Jain for BDS.

OBJECTIVES:

At the end of the semester the students should be able

- To have a knowledge about the chemistry and metabolism of proteins
- To learn about nutrition-balanced diet and malnutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

UNIT I - PROTEINS

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

UNIT II - NUCLEIC ACIDS

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

UNIT III - HAEMOGLOBIN

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

UNIT IV-- MINERALS

- Macro & Minor Minerals & Metabolism

UNIT V -- NUTRITION

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

UNIT VI -- ORGAN FUNCTION TEST

- RFT

UNIT XI - ACID BASE BALANCE

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles' Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

Text books Recommended :

- Textbook of Biochemistry for Paramedical Students By Dr.P.Ramamoorthy
- Essentials of Biochemistry by U. Sathyanarayana

Reference books :

- Text book of Biochemistry for Medical students by DM vasudevan, Sreekumari S, Kannan Vaidyanathan. 7th Edition
- Harper's Illustrated Biochemistry – 30th Edition.

FOOD MICROBIOLOGY II (UE)

OBJECTIVES:

At the end of the semester the students should be able to

- Explain general and specific spoilage of foods
- Explain in detail about soil borne, water borne and air borne infections.

UNIT I – Microbiology of Deficient food

Spoilage, contamination sources, types, effect on the following:

- Cereal & cereal products
- Sugar & sugar products
- Vegetables & fruits
- Meat & meat products
- Fish, egg and poultry
- Milk & milk products
- Canned foods.

UNIT II – Environmental Microbiology

- Water & water borne diseases, Air & air borne diseases, Soil & soil borne diseases, Sewage and diseases.
- Beneficial effect of micro organisms.

UNIT III – Microbial intoxication and infections

- Sources of contamination of food, toxin production and physiological action, sources of infection of food by pathogenic organisms, symptoms and method of control. Relevance of microbiology standards for food safety.

PRACTICALS

I. SPOTTERS

II. Clinical case discussion with charts

1. Food poisoning
2. Gastroenteritis
3. Water borne disease
4. Air borne disease
5. Milk borne disease

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).
2. Food Microbiology, 1st Edition, M. R. Adams 1995
3. Food Microbiology, 5th Edition Frazier, Westhoff, Vanitha N M 2014

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Subhash Chandra Parija – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,Satish Patwardhan – Handbook of Practical examination in Microbiology

OBJECTIVES

To enable students to:

- Learn the principles of meal planning
- Acquire knowledge on planning meals for different age groups

UNIT I

- **Nutrition during early childhood (Toddler/Preschool):** Growth and nutrient needs, Food requirements, Dietary guidelines, Feeding problems, Nutrition related problems, Growth monitoring, Importance of growth charts, GOBIFFF.

UNIT II

- **Nutrition during school children:** Nutritional and food requirements, Dietary guidelines, Importance of breakfast, Feeding problems, Packed lunch, School lunch programmes

UNIT III

- **Nutrition during adolescence:** Growth and nutrient needs, Food requirements, Food habits and dietary guidelines, Nutritional problems, Nutritional programmers' for adolescence.

UNIT IV

- **Nutrition during adulthood** – Reference man, Reference woman, Nutritional requirements, feeding pattern. Geriatric nutrition: Process of ageing, Factors affecting food intake and nutrient use, Change in organ function with ageing, Nutrient needs, Nutrition related problems

PRACTICALS

Plan and prepare a diet for

1. A pre-school child (1-3 years)
2. A school going child (boy and girl of 7- 9 years)
3. An adolescent (boy and girl 17 – 19 years)

Plan and prepare a diet for

1. Sedentary, moderate and heavy worker (male and female)

2. A senior citizen
3. A middle income family

RECOMMENDED BOOK:

1. Nutrition and Diet Therapy Corroll lutz & Karen Przytulski Japee, 14Th edition
2. Therapeutic Paediatric Nutrition Madhu Sharma Japee, 1st edition, 2011
3. Diet Management Rekha Sharma Elsevier, 4th edition, 2011
4. Food and Nutrition L.C.Gupta, Kusum Gupta, Abhishek Gupta Japee, 6th edition, 2010
5. Nutrition and Therapeutic Diets Darshan Sohi Japee, 1st edition, 2013

REFERENCE BOOKS:

1. Nutritive Value of Indian Foods C.Gopalan, B.V.Rama Sastri and S.C.Balasubramanian Japee, 1st edition, 1971
2. Food and Nutrition Dr.Shrinandan Bansal AITB, 2nd edition, 2012

QUANTITY FOOD PRODUCTION (UE)

OBJECTIVES:

- To understand the application of basic principles of bulk production of the food.
- To gain knowledge regarding selection and purchase of food.
- To develop skills in menu planning for quantity food preparation.
- To understand the different styles of food services.
- To gain knowledge of food service layout.

COURSE CONTENT:

Unit I: Aims and objectives of different service outlets

- Industrial
- Institutional
- Hospital

Unit II: Different food and beverage outlets

- 5 types of services of food and beverage outlets.
- Staff organization of different outlets (A la carte and Table d hote)

Unit III: Menu planning

- Sequence of course- Indian- techniques of writing menus.
- Types of meals and styles of service
- Breakfast, lunch, dinner, afternoon, tea & snacks (table d hote and a la carte).

Unit IV: Plant and equipment management

- Maintenance, sanitation of plant, safety, security, garbage disposal & pest control.

Unit V: Beverages

- Alcoholic and non-alcoholic- Hot & cold- Classification of beverages, use & importance in meals and snacks, suitable glassware for beverage service.

Unit VI: Use of bills and checks in control system outlets

Recommended books:

1. Food service system and Lewis J. Minor, Ronald F. Cichy, Avi Publishing Co.
2. Food service Operations; Mahmood A.Khan, Avi Publishing Co.

Reference books:

1. Modern Restaurant service, John Fuller, Hutchinson, 1983.
2. Food and Beverage Service, D.R. Lillicarp 2nd edn. BLBS, Reprinted 1989.
3. Mass Catering WHO publication.

PRACTICAL & VIVA VOCE

OBJECTIVES:

- Develop skills in food production and service.

CONTENT:

1. Organizing, preparing and serving food for three different meals for 10 members.
2. Setting up the restaurant- laying of table cloth changing, setting up the silver and other table arrangements.
3. Serving and clearing practice, French and English service.
4. Service of beverages tea, coffee, juices and alcoholic beverages.
5. Laying for breakfast
6. Tray service
7. Order taking, making out check bills, presentation of bills.
8. Up keep and cleaning of cutlery, crockery, other equipment.

WESTERN COOKERY

- Soups: Mixed veg, tomato cream soup, carrot cream soup, mulligatawny soup, minestone soup, chicken soup and corn soup.
- Sauces: white sauce, cheese sauce, mayonnaise sauce, pizza sauce, curry sauce, tomato sauce and hollandaise sauce.
- Entrees: Vegetable pie, veg and meat loaf, chicken casserole, hamburgers, vegetable burgers.
- Vegetables: vegetables au gratin, Baked cauliflower, savoury vegetables, baked stuffed capsicum
- Sweets: Bread pudding, soufflés, trifle, coffee mousse, gateaux.

BAKERY PRODUCTS

- Short crust pastries: different types of tarts, pies and turn overs. Vegetable and mutton pattis.
- Cakes and Cookies: plain cake, fruit cake, banana bread, date and walnut cake and varieties of cookies.
- Breads, different kinds of rolls, doughnuts.
- Different types of Icings.

Text books suggested for reading:

1. Modern Restaurant service, John Fuller, Hutchinson, 1983.
2. Food and Beverage Service, D.R. Lillicarp 2nd edn. BLBS, Reprinted 1989.
3. Mass Catering WHO publication.

ADVANCED NUTRITION (IE)

Objectives

To enable the students

- To understand the relation between nutrition and health.
- To acquire knowledge about the main nutrients and its functions in the body.

Unit-I

Macro minerals

- Calcium, Phosphorus, Magnesium - Functions, sources, requirements, factors affecting absorption and utilization, Deficiency and Toxicity. Calcium – Phosphorus ratio.

Unit II

Micro minerals

- Iron, Zinc, Copper, Selenium, Chromium, Iodine and Fluorine- Functions, sources, requirements, factors affecting absorption and utilization, deficiency and toxicity.

Unit III

Fat Soluble Vitamins

- Functions, sources, requirements, factors affecting absorption and utilization, deficiency, toxicity of vitamin A, D, E, K , conversion factor of vitamin A and Vitamin D.

Unit IV

Water Soluble Vitamins

- Functions, sources, requirements, factors affecting absorption and utilization, deficiency and toxicity of Thiamin, Riboflavin, Niacin, vitamin B6, Vitamin B12, Biotin, Pantothenic acid, Folic acid and Vitamin C.

RECOMMENDED BOOKS:

1. Robert's Nutrition Work with Children, Martin S.R., 1963, The University of - Chicago Press, Chicago.
2. Assessment of Nutrition Status of the Community, Jelliffe D.B. 1966, WHO, Geneva.
3. Nutrition in the Sub-Tropics and Tropics, Jelliffe D.B. 1968.

Computer Science (IE)

Unit-I. History of computers

- Definition of computers, Input devices, Output devices, Storage devices, Types of memory and units of measurement, Range of computers, Generations of computers, Characteristics of computers

Unit-II. System

- Hardware, Software, system definition, Fundamentals of Networking, Internet, Performing searches and working with search engines, types of software and its applications

Unit-III. Office application suite

- Word processor, spreadsheet, presentations, other utility tools, Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

Unit-IV. Language

- Comparison chart of conventional language, Programming Languages, Generations Of Programming Languages, Compilers and Interpreters, Universal programming constructs based on SDLC, Variable, constant, identifiers, functions, procedures, if while, do – while, for and other Structures. Programming in C language, Data types, identifiers, functions and its types, arrays, union, structures and pointers

Unit-V. Introduction to object oriented programming with C++

- Classes, Objects, Inheritance Polymorphism and Encapsulation. Introduction to databases, and query languages, Introduction to Bioinformatics.

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions

7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in allied health sciences

Text Books:

1. Peter Norton., Introduction to Computers. 7th Edition, Tata McGraw Hill Education Private Limited 2010.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat., Microsoft Office 2007. 1st Edition, Delmar Cengage Learning 2010

Reference Books:

1. C programming tutorial (K&R version 4) Author(s) Mark Burgess
2. Red hat Linux 9 bible by Christopher Negus May 2003

SEMESTER -III

| S.No | SUBJECT |
|------|---------|
|------|---------|

| | |
|---|----------------------------------|
| 1 | Basic Dietetics –Theory(UE) |
| 2 | Basic Dietetics -Practical(UE) |
| 3 | Food Science -Theory(UE) |
| 4 | Food Science - Practical(UE) |
| 5 | Medical Ethics and Biosafety(IE) |
| 6 | Psychology(IE) |

SEMESTER-III

BASIC DIETETICS – THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge of the diet therapies and nutritional care in disease conditions.

2. Develop skills in planning a diet for disease condition.

UNIT I – Diet Therapy & Nutritional care in disease

- The nutritional care process
- Nutritional care plan

UNIT II – Adjuncts to Diet Therapy

- Physical activity, exercise, yoga and stress management

UNIT III – Pre & Post Operative Nutrition

UNIT IV – Nutrition support in Burn patients

UNIT V – Diet in Infections and Fevers

- General Dietary considerations, Typhoid, Influenza, Malaria, Tuberculosis & AIDS

REFERENCE BOOKS:

1. Srilakshmi B., Dietetics, New Age International (P) Ltd, Publishers, Eighth multi colour edition, 2016.
2. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
3. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6 th edition, 2000.
4. Mahtab. S. Bamji, Kamala Krishnaswamy and G.N.V Brahman, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition. 2009.

BASIC DIETETICS – PRACTICAL (UE)

PRACTICALS

1. Planning, preparation and displaying of diet for Post operative patient
2. Planning, preparation and displaying of diet for Burn patient
3. Planning, preparation and displaying of diet for Typhoid

4. Planning, preparation and displaying of diet for Influenza
5. Planning, preparation and displaying of diet for Malaria
6. Planning, preparation and displaying of diet for Tuberculosis
7. Planning, preparation and displaying of diet for AIDS

REFERENCE BOOKS:

1. Srilakshmi B., Dietetics, New Age International (P) Ltd, Publishers, Eighth multi colour edition, 2016.
2. Mangala Kango, Normal Nutrition, Curing diseases through diet, CBS Publications, First edition, 2005.
3. Sue Rodwell Williams, Nutrition and Diet Therapy, C.V. Melskey Co., 6 th edition, 2000.
4. Mahtab. S. Bamji, Kamala Krishnaswamy and G.N.V Brahman, Text Book of Human Nutrition, Oxford and IBH Publishing Company, Third Edition. 2009.

FOOD SCIENCE - THEORY (UE)

OBJECTIVE:

The students will be able to

1. Learn about the functions of food
2. Study in detail about food groups

UNIT I: INTRODUCTION TO FOODS

- Definition, functions, food groups, classification of foods. Study of different cooking methods, merits and demerits, Solar cooking, Microwave cooking. Cereals - Cereals and millets- breakfast cereals, cereal products, fast foods- structure, processing, use in variety of preparation, selection, variety, storage, nutritional aspects and cost.

UNIT II: PULSES

- Pulses and legumes- Production (in brief), Selection and variety, storage, processing, use in variety of preparation, nutritional aspects and cost. Highlighting soya beans, lathyrism- removal of toxins.

UNIT III: MILK AND MILK PRODUCTS

- Composition, classification, quality, processing, coagulation of milk, digestion of milk, storage, uses and cost. Nutritional aspects of milk, curd, butter, paneer, khoa, cheese, ice cream, kulfi and various kinds of processed milk.

UNIT IV: EGG, FISH, POULTRY AND MEAT

- Selection, quality, purchase, storage, uses and nutritional aspects. Spoilage of egg, fish, poultry and meat.

UNIT V: VEGETABLES AND FRUITS

- Variety, selection, purchase, storage, availability, cost, use and nutritional aspects of raw and processed vegetables and fruits. Effects of cooking on colour, texture, flavour, appearance and nutritive value.

TEXT BOOKS

1. Swaminathan (1995): “Food & Nutrition”, The Bangalore Printing & publishing co ltd., Vol I, Second Edition, Bangalore.
2. Srilakshmi (1997): “Food Science”, New Age International (P) Ltd, Publishers, Pune.

REFERENCE BOOKS

1. Mudambi .R. Sumathi & Rajagpal M.V (1983), “Foods & Nutrition”, Willey Eastern Ltd, Second Edition, New Delhi.
2. Thangam.E.Philip(1965): Modern Cookery, Orient Longman, II edition. Vol II, Bombay.

FOOD SCIENCE- PRACTICAL (UE)

OBJECTIVES

- To understand the techniques of estimating nutrients

EXERCISE

1. Familiarization with different stoves, ovens and simple kitchen equipment.
2. Methods of measuring and weighing dry ingredients and liquids.

3. Cereal cookery

- Methods of combining flour with liquid eg. Powdered cereal coarse(eg. Phirnee, broken wheat uppuma) and fine (eg. Ragi porridge, wheat halwa).
- Cereal Grains – different methods of cooking rice – straining, absorption – cooking over low heat, pressure cooking, addition of fat, microwave and rice cooker.
- Rice preparations – lime rice, tamarind rice, coconut rice, curd rice, egg fried rice, peas fried rice, iddli and dosai.
- Wheat and ragi preparations – Kesari, poori, paratha, bhathura, naan, ragi puttu, ragi leaf cake, ragi adai.

4. Pulse Cookery

- Different methods of cooking pulses – hard water, soft water, soaking, addition of soda bicarbonate, addition of raw papaya, pressure cooking eg. Any whole gram and any dhal.
- Pulse Preparations – brinjal sambar, sprouted green gram patchadi, cow peas sundal, adai, tomato dhal maseel, ven pongal, ompodi, sugian, green gram payasam, masala vadai and chole.

5. Vegetable Cookery

- Different methods of cooking vegetables – effect of shredding, dicing, acid and alkali, pressure cooking, steaming with and without lid. Eg. Potato, beetroot, carrot and greens.
- Vegetable preparations – potato methi curry, mashed potatoes, aloo tikke, vegetable kurma, avial, keera maseel, cabbage pugath, carrot cucumber, ridge gourd and green gram dhal kootu, tomato chutney and carrot halwa.

6. Fruits

- Different ways of serving oranges, stuffed dates, banana fritters, fruit salad, stewed apricots, banana with custard, fruit jelly, grape jam, fruit punch, baked apple and pineapple upside down cake.

MEDICAL ETHICS AND BIO SAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tamparo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (UE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression – Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler,“**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
- 3.Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc.,2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

| S.No | SUBJECT |
|-------------|--------------------------------------|
| 1 | Advance Dietetics–Theory(UE) |
| 2 | Advance Dietetics -Practical(UE) |
| 3 | Personnel Management - Theory(UE) |
| 4 | Personnel Management - Practical(UE) |
| 5 | Basics And Advanced Life Support(IE) |
| 6 | Sociology(IE) |

SEMESTER IV
ADVANCE DIETETICS –THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge of the major deficiencies.
2. Develop skills in planning special diets for disease condition.

UNIT I: An overview of Special Diets

- Purine-Restricted Diet, Ketogenic Diet, Paleo diet, Diet in Cleft Lip and /or Palate.

UNIT II: Food Sensitivity

- Types of reactions, foods involved in Sensitivity, Symptoms, Diagnosis, Treatment, food Intolerance.

UNIT III: Nutritional Anaemia

- Prevalence, causes, types, differentiating Anaemias & prevention.

UNIT IV: PEM

- Prevalence, aetiology, clinical features, Nutritional Requirement, Treatment, Prevention.

TEXT BOOKS

1. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
2. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi

REFERENCE BOOKS

1. Mahan, L.K., Arlin, M.T (1992) Krause's Food, Nutrition and Diet Therapy, 8th Ed. W.B. Saunders Company, London
2. Williams S.R. (1989): Nutrition and Diet Therapy, 6th Ed. Times Mirror / Mosby College Publishing, St. Louis.
3. Raheena Begum (1989) A Test Book of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi.
4. Robinson, C.H., Lawler, M.R., Chenoweth, W.L, and Garwick A.E (1986) Normal and Therapeutic Nutrition, 17th Ed., Macmillan Publishing Co.
5. Dacie and Lewis Practical Haematology, Bain, 11th Edition, Elsevier Health Sciences, 2012.

ADVANCE DIETETICS –PRACTICAL (UE)

PRACTICALS

1. Planning, preparation and displaying of diet for Purine-Restricted Diet
2. Planning, preparation and displaying of diet for Ketogenic Diet
3. Planning, preparation and displaying of diet for Paleo Diet
4. Planning, preparation and displaying of diet for Iron Rich Diet
5. Planning, preparation and displaying of diet for Energy Rich Diet
6. Planning, preparation and displaying of diet for Protein Rich Diet

TEXT BOOKS

1. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
2. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi

PERSONNEL MANAGEMENT–THEORY (UE)

OBJECTIVES:

The students will be able to

1. Gain basic knowledge about the organization and management.
2. To learn about labour laws and legislations

UNIT I- Organization & Management

- Definition, types of organization, functions and tools of management.

UNIT II- Food Material Management

- Food selection, purchasing, receiving and storeroom management.
- Controls of management.

UNIT III- Personnel Management

- Recruitment, selection and training of personalities, work standards, productivity, supervision, performance appraisal and motivation incentives for effective performances.

UNIT IV- Labour Policies & Legislation

- Personal policies,
- Laws affecting food service institution.

Text book:

1. Mohini sethi: Institutional food management, 2nd edition, New age international publisher.
2. Mohini sethi: Catering management ,3rd edition ,New age international publisher.

PERSONNEL MANAGEMENT–PRACTICAL (UE)

PRACTICALS

VISIT & APPRAISAL OF ANY ONE MEDICAL ORGANISATION

1. Work simplifications: food preparation, calculating work unit, time norms etc.
2. Costing, accounting, budgeting and purchase.
3. Store keeping: listing and management of food items in the store.
4. Personnel recruitment: preparations of a project and report making.
5. Maintenance of the clothing for persons and staff involved in kitchen area.
6. Prepare an inventory for evaluating staffs personal hygiene.

Text book:

1. Mohini sethi: Institutional food management, 2nd edition, New age international publisher.
2. Mohini sethi: Catering management ,3rd edition ,New age international publisher.

BASIC AND ADVANCED LIFE SUPPORT(IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS, TRIAGE-Primary Survey, Secondary Survey, Airway & Ventilatory management, Shock, Central & peripheral venous access, Thoracic trauma – Tension pneumothorax, Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma, Head trauma, Musculoskeletal trauma, Electrical injuries, Thermal burns, Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support, Defibrillation, Drugs used in ACLS, Emergency cardiac pacing, AED, Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY(IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER V

| S.No | SUBJECT |
|-------------|--|
| 1. | Clinical Nutrition I - Theory(UE) |
| 2. | Clinical Nutrition I - Practical(UE) |
| 3. | Community Nutrition -Theory(UE) |
| 4. | Community Nutrition - Practical(UE) |
| 5. | Environmental Science And Community Medicine(IE) |

SEMESTER V
CLINICAL NUTRITION I – THEORY (UE)

OBJECTIVES:

- To enable the students to understand the principles of diet and nutrient modifications for different diseases
- Develop skills in planning and evaluating nutrition for different disease condition.

UNIT I – Diet in Obesity

- Aetiology, Theories & Role of hormones
- Assessment, Grades, Types
- Treatment, Principles of Dietetic Management, Complications

UNIT II – Diet in underweight

- Aetiology
- Nutritional & Food requirement

UNIT III – Diet in Cardiovascular Diseases

- Clinical effects, risk factors
- Role of Fat in the development of Atherosclerosis
- Treatment

UNIT IV – Diet in Hypertension

- Causes, pathogenesis
- Types, symptoms
- Principles of diet.

UNIT V – Diet in Diabetes mellitus

- Types, Aetiology
- Insulin Resistance, symptoms, diagnosis
- Treatment, complications

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

REFERENCES BOOKS

1. Mahan, L.K. and Escott-Stump, S. (2000) Krause's Food, Nutrition and Diet Therapy, 10th Ed. W.B. Saunders Company, London.
2. Williams S.R. (1993): Nutrition and Diet Therapy, 7th Ed. Times Mirror / Mosby College Publishing, St. Louis.
3. Antia F.P, Clinical Dietetics and Nutrition, Oxford University Press.
4. Shills, M.E, Olson, J.A, Shike, M and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition.

CLINICAL NUTRITION I – PRACTICAL (UE)

CONTENTS

1. Planning, preparation and calculation of diets for Obesity.
2. Planning, preparation and calculation of diets for Underweight.
3. Planning, preparation and calculation of diet in cardiovascular diseases.
4. Planning, preparation and calculation of diets for Hypertension
5. Planning, preparation and calculation of diets for Insulin dependent Diabetes mellitus,
6. Planning snacks, desserts and beverages for diabetes.

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

COMMUNITY NUTRITION -THEORY (UE)

OBJECTIVES:

To enable the students

1. Gain insight into the national nutritional problems and their implications
2. Appreciate the national and international contribution towards nutrition improvement in India.
3. Understand the importance of nutrition education
4. Develop skills in organizing and evaluating nutrition projects in the community

UNIT I Concept and scope of community nutrition, Assessment of Nutritional Status.

UNIT II Nutrition related policies and programmes

- Millennium Development Goals
- NNP
- Health, Nutrition and Family Welfare Through the XIIth five year plan
- Programmes to control malnutrition
- National Food Security Act, 2013.

UNIT III - Role of International and National agencies in combating Malnutrition.

- International Agencies- WHO, FAO, UNCF, CARE
- National Agencies- ICAR, ICMR, NIN, CFTRI.

UNIT IV - Nutrition Education

- Methods, Teaching Aids, Mass communication media & Computer applications.

UNIT V - Nutrition and Infection

- Immunity, Infections and Infestations, Effect of Malnutrition on Infection, Effect of Infection on Nutritional status & nutrients, AIDS.

TEXT BOOK

1. Swaminathan, M., Essentials of Food and Nutrition. An Advanced Textbook Vol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore, 2007.
2. Srilakshmi, B., Nutrition Science, New Age International Publication, New Delhi, 2010.

REFERENCE BOOKS

1. Park, A. Park's Textbook of Preventive and Social Medicine, XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India), 2007.
2. Bamji M.S, Prahlad Rao N, Reddy V., Textbook of Human Nutrition, II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi, 2004.
3. Bhatt D.P, Health Education, Khel Sahitya Kendra, New Delhi, 2008.
4. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L., Public Health Nutrition, Blackwell Publishing Co. UK, 2004.

COMMUNITY NUTRITION -PRACTICAL (UE)

OBJECTIVES:

The objectives of this practical course are to enable the students

- To learn and prepare different types of visual aid for the community
- To gain practical experience in giving demonstration and conducting survey and other methods of assessments.

PRACTICALS

1. Diet and Nutrition surveys
 - a) Identifying vulnerable and at risk groups.
 - b) Diet survey and breast feeding and weaning practices of specific groups.
 - c) Use of anthropometric measurements in children.
2. Methods of Extension used in community
 - a) Preparation of visual aids-charts, posters models, etc. for exhibition.
 - b) Lecture and Method Demonstrations to target groups.
3. Field visits
 - a) Observe the working of nutrition programmes.
 - b) Hospitals to observe nutritional deficiencies.

TEXTBOOK:

1. Bhatt D.P, Health Education, Khel Sahitya Kendra, New Delhi, 2008.
2. Srilakshmi, B., Nutrition Science, New Age International Publication, New Delhi, 2010.
3. Gibney, M.J., Margetts, B.M., Kearney, J.M., Arab, L., Public Health Nutrition, Blackwell Publishing Co. UK, 2004.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE(IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology**: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health**: Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution .Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

RECOMMENDED TEXT BOOKS:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

SEMESTER VI

| S.No | SUBJECT |
|-------------|--|
| 1 | Clinical Nutrition II - Theory (UE) |
| 2 | Clinical Nutrition II - Practical (UE) |
| 3 | Dietetics And Counseling - Theory(UE) |
| 4 | Dietetics And Counseling - Practical(UE) |
| 5 | Healthcare And Basic Principles(IE) |

SEMESTER VI

CLINICAL NUTRITION II – THEORY (UE)

OBJECTIVES:

To enable the students to understand the principles of diet and nutrient modifications for different diseases.

UNIT I – Diet in GI diseases

1) Upper Gastrointestinal Diseases

- GERD
- Peptic Ulcer
- Gastric surgery

2) Intestinal Diseases

- Constipation
- Diarrhea

3) Malabsorption

4) Inflammatory Bowel Disease

UNIT II – Diet in Diseases of Liver and Pancreas

- Functions of liver, causes
- Damage caused to Liver
- Infective Hepatitis
- Cirrhosis of Liver
- Hepatic Encephalopathy
- Liver Transplantation
- Cholecystitis & cholelithiasis
- Pancreatitis

UNIT III – Diet in Diseases of Kidneys

- Functions of kidneys
- Glomerulonephritis
- Nephrotic syndrome
- Renal Failure

- Dialysis
- Renal transplant
- Urolithiasis

UNIT IV – Diet in Cancer

- Classification, Risk factors, Symptoms
- Nutritional problems of Cancer Therapy
- Nutritional Requirements
- Dietary Management

TEXTBOOKS

1. Shubangini A Joshi, (1998): Nutrition and Dietetics, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi.
2. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
3. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

REFERENCES BOOKS

4. Mahan, L.K. and Escott-Stump, S. (2000) Krause's Food, Nutrition and Diet Therapy, 10th Ed. W.B. Saunders Company, London.
5. Williams S.R. (1993): Nutrition and Diet Therapy, 7th Ed. Times Mirror / Mosby College Publishing, St. Louis.
6. Antia F.P, Clinical Dietetics and Nutrition, Oxford University Press.
7. Shills, M.E, Olson, J.A, Shike, M and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition.

CLINICAL NUTRITION II – PRACTICAL (UE)

CONTENTS

1. Planning, preparation and calculation of diets for Peptic Ulcer
2. Planning, preparation and calculation of diets for Constipation
3. Planning, preparation and calculation of diet for Diarrhoea
4. Planning, preparation and calculation of diets for Cirrhosis of liver
5. Planning, preparation and calculation of diets for Pancreatitis
6. Planning, preparation and calculation of diets for Nephrotic syndrome
7. Planning, preparation and calculation of diets for Renal failure
8. Planning, preparation and calculation of diets for Cancer.

TEXTBOOKS

1. National Institute of Nutrition, (2005): Dietary Guidelines for Indians – A Manual, Hyderabad.
2. Srilakshmi. B, (2005): Dietetics, V Edition, New Age International (P) Ltd, Publishers, Chennai.

DIETETICS AND COUNSELLING - THEORY (UE)

OBJECTIVES:

To enable students to:

- Obtain knowledge on the role of diet in disease conditions
- Gain experience in planning, preparing and serving therapeutic diets
- Understand the role of dietitian in the hospital and community

UNIT-1

- Practical consideration in giving dietary advice and counseling
 - a) Factors affecting and individual food choice.
 - b) Communication of dietary advice
 - c) Consideration of behaviour modification
 - d) Motivation.

UNIT-II

- Counseling and educating patient
 - a) Introduction to nutrition counseling
 - b) Determining the role of nutrition counselor
 - c) Responsibilities of the nutrition counselor
 - d) Practitioner v/s client managed care
 - e) Conceptualizing entrepreneur skills and behavior
 - f) Communication and negotiation skills.

UNIT-III

- Teaching aids used by dietitians
 - a) Charts, leaflets, posters etc.,
 - b) Preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

UNIT-IV

- Computer application
 - a) Use of computers by dietitian
 - b) Dietary computations
 - c) Dietetic management
 - d) Education/ training
 - e) Information storage
 - f) Administrations
 - g) Research

UNIT-V

- Computer application
 - a) Execution of software packages
 - b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients
 - c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

TEXT BOOK

1. Shills and Young. Modern Nutrition In Health And Disease 15. Willims, S. R.: Nutrition and Diet Therapy, 4th ed., The C. V. Mosby Co., S1. Louis, 1981.
2. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
3. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.
4. Joshi, S.A (1992): Nutrition and Dietetics, TATA McGraw Hill publications, New Delhi Mahan,L.K.Arlin.M.T(1992) Krause"s Food, Nutrition and Diet Therapy, 8 th Ed.W.B.Saunders Company, London

DIETETICS AND COUNSELLING- PRACTICAL (UE)

OBJECTIVES

- a) To enable the students to understand the modifications in nutrients and dietary requirements for the therapeutic condition and dietary management of different diseases.

PRACTICALS

- 1) Project planning for any one disease.
- 2) Computer application for different diseases.
- 3) Submitting computed data.
- 4) Preparations of teaching aids in the field of nutrition.
- 5) Preparation of case history of a patient and feeding of information in the hard disc.

TEXT BOOK

1. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
2. Antia, F.P (1973): Clinical dietetics and Nutrition, Second Edition, Oxford University Press, Delhi.

HEALTH CARE AND BASIC PRINCIPLES (IE)

UNIT-I Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

UNIT-II Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

UNIT-III Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

UNIT-IV Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

UNIT-V Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

UNIT-VI Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

UNIT-VII Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

UNIT-VIII Health Insurance

REFERENCE BOOKS:

1. Principles of Hospital Administration and Planning, BM Sakharkar, 2nd edition, Jaypee Brothers, Medical Publishers Pvt. Limited, 2008
2. Hospital Administration And Management : Theory And Practice, R. Kumar S.L. Goel, Deep and Deep Publications, 2007
3. Principles of Management, Mason Andrew Carpenter, Talya Bauer, 3rd edition, Flat World Knowledge, L.L.C., 2010

SEMESTER-VII

| S.NO | SUBJECT |
|-------------|--|
| 1 | Project/ Dissertation |
| 2 | Biostatistics and research methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY(IE)

UNIT-I Statistics - Definition and Terms

- What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability :

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution :

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation :

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK Mahajan Jaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S Sundar Rao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publications pvt ltd, 2008
4. Introductory Statistics. Prem S.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences, Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -6 months



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2018-2019. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry and Biology
- ii) Physics, Chemistry, Botany and Zoology
- iii) Physics, Chemistry, Biology and Biochemistry

b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the B.Sc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics, English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- a) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- b) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- c) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY

Max.Marks- 60 Marks

Duration -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL & VIVA VOCE

1. Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

I. Theory 20 Marks

II. Practical 5 Marks

TOTAL

100 Marks

SEMESTER III – SEMESTER VI (FOR ALL SPECIALITIES)

THEORY

Max.Marks- 80 Marks

Duration -3 Hours

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1.Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams(I,II,III)

TOTAL

100 Marks

PRACTICAL

Max marks: 80

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory & Practical) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks: 20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- I. 40% minimum in the University End-Semester Theory examination
- II. 40% minimum in the University End-Semester Practical examination
- III. 40% of marks in the subject where internal evaluation alone is conducted
- IV. 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and re-totaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and re-totaling.

20. Carry- over of failed subjects

- a) A candidate has to pass in theory and practical examinations separately in each of the paper.
- b) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- c) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,

- i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
- ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be university)
FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION
SEMESTER – I
(B.Sc., Emergency and Trauma Care Technology)

TOTAL HOURS: 330 Hrs

| S. No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|-------|---------------------|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Anatomy-I (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2. | Physiology-I (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3. | Biochemistry-I (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4. | Microbiology-I (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5. | Pathology-I (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6. | English (IE) | 30 hours | - | - | - | 50 | - | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION
SEMESTER – II
(B.Sc., Emergency and Trauma Care Technology)

Total Hours – 420 Hrs

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|----------------------|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Anatomy-II (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2. | Physiology-II (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3. | Biochemistry-II (UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4. | Microbiology-II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5. | Pathology-II(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6. | Pharmacology(UE) | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7. | Physics (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 8 | Computer Science(IE) | 30 hours | - | - | - | 50 | - | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION
SEMESTER – III
(B.Sc., Emergency and Trauma Care Technology)

Total Hours – 420Hrs

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|--|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Anatomy, Physiology and Pharmacology related to Emergency Medicine -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Anatomy, Physiology and pharmacology related to Emergency Medicine - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Clinical Microbiology, Pathology and Biochemistry related to Emergency Medicine - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Clinical Microbiology, Pathology and Biochemistry related to Emergency Medicine - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics and Biosafety (IE) | 30 hours | - | | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | | - | 50 | - | 50 |

UE University Exams

SCHEME OF EXAMINATION
SEMESTER – IV
(B.Sc., Emergency and Trauma Care Technology)

Total Hours – 420Hrs

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Trauma Care - First Aid, Triage, Life Support, and Resuscitation - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Trauma Care - First Aid, Triage, Life Support, and Resuscitation - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Emergency Medical Equipment, Cardiopulmonary Emergencies and Poisoning - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Emergency Medical Equipment, Cardiopulmonary Emergencies and Poisoning - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Prehospital Care Record Documentation (IE) | 30 hours | - | | - | 50 | - | 50 |
| 6. | Sociology (IE) | 30 hours | - | | - | 50 | - | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION
SEMESTER – V
(B.Sc., Emergency and Trauma Care Technology)

Total Hours – 390Hrs

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Orthopaedic Emergencies, burns and Surgical Emergencies– Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Orthopaedic Emergencies, burns and Surgical Emergencies– Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Obstetrics, Gynaecological and Paediatric Emergencies - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Obstetrics, Gynaecological and Paediatric Emergencies - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Environmental science and Community medicine (IE) | 30 hours | - | | - | 50 | - | 50 |

UE University Exams

SCHEME OF EXAMINATION

SEMESTER – VI

(B.Sc., Emergency and Trauma Care Technology)

TOTAL HOURS 390hrs

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | TOTAL |
|------|--|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department*Exams) | | |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical procedures and instruments in emergency services - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Clinical procedures and instruments in emergency services - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Critical Care and Disaster Management - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Critical Care and Disaster Management - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Healthcare and basic Principles | 30 hours | - | 50 | - | 50 | - | 50 |

UE University Exams

IE Internal Exam

SCHEME OF EXAMINATION
SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|--|------------------|-----------|-----------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Biostatistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

UE University Exams

IE Internal Exam

Dr. M.G.R.EDUCATIONAL AND RESEARCH INSTITUTE

(Deemed to be university)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 YEAR

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi
- c. Biceps
- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye ballSS

6. Viva Voce

- a. Radiology – Xrays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure, classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic. Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphology and functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition & functions of gastric juice.
- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb. Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II. Estimation of Hemoglobin

III. RBC

IV. WBC

V. Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,

- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose

- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave

- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**
 - Spotter
- **GROSS (SPOTTER)**
 - Fatty liver
 - Lipoma
 - Dry gangrene foot
 - Wet gangrene bowel
 - CVC Spleen
 - Hydatid cyst
 - TB – Lung
- **INSTRUMENTS**
 - Westergrens ESR tube
 - Sahlihemocytometer
 - Neubaur's chamber
 - Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**
 - Pituitary gland
 - Pineal body
 - Thyroid & parathyroid gland
 - Adrenal
 - Pancreas
 - Gonads – Ovary & Testis
- **Cardio-Vascular System**
 - Heart
- **Lymphatic system**
 - Spleen
- **Respiratory System**
 - Lungs
 - Larynx
 - Trachea
- **Digestive System**
 - Salivary glands
 - Esophagus
 - Pharynx
 - Stomach
 - Liver, Gall bladder
 - Duodenum
 - Small intestine
 - Large intestine
- **Urinary system**
 - Kidneys
 - Ureter
 - Urinary bladder
- **Reproductive System**
 - Saggital section – Male & Female pelvis
 - Uterus & ligaments
 - Ovary
 - Prostate
 - Seminal vesicals
 - Vas deferens
 - Testis
- **Viva Voce**
 - Radiology – Xrays
 - Osteology
 - Charts
 - Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors

- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus , Basal ganglia , Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition,normal values,intrapulmonary and intra pleural pressures,surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis,Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder

15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)**1. CVS**

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis

-Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis
- Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot

- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition
Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition
Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

| | |
|--|--|
| Students Discussion | Spinal |
| Insulin | Intra arterial |
| I.V cannula | Syringes: Tuberculin |
| Scalp. Vein set | |
| Students Discussion | Enema can |
| | Inhalers |
| Spacers | |
| Nebulizers | |
| Students Discussion | Tablets – Enteric coated, Sustained release, Sub-lingual |
| Students Discussion | Capsules, Spansules, Pessary, Suppository |
| Students Discussion | Topical Preparation, Ointment, Lotion, Powder, |
| Drops – eye / ear | |
| Charts: Mechanism of action of drugs, adverse effects, toxicology | |
| Spotters: drugs | |
| Text books suggested for reading: | |
| <ul style="list-style-type: none"> • Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar • Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak • Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma | |

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance – resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,

- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER – III

| S.No: | Subject |
|--------------|--|
| 1. | Anatomy, Physiology and Pharmacology related to Emergency Medicine– Theory (UE) |
| 2. | Anatomy, Physiology and pharmacology related to Emergency Medicine – Practical (UE) |
| 3. | Clinical Microbiology, Pathology and Biochemistry related to Emergency Medicine - Theory (UE) |
| 4. | Clinical Microbiology, Pathology and Biochemistry related to Emergency Medicine - Practical (UE) |
| 5. | Medical Ethics And Biosafety (IE) |
| 6. | Psychology(IE) |

SEMESTER-III

ANATOMY, PHYSIOLOGY AND PHARMACOLOGY RELATED TO EMERGENCY MEDICINE – THEORY (UE)

Objectives:

- To develop in depth knowledge on anatomy and physiology of various organs and structures
- To develop exhaustive ideology of various Pharmacological aspects in relation to emergency medicine.

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding during an emergency and trauma
- Will be able to provide better support during a emergency and trauma with knowledge of pharmacological aspects.

Unit-I INTRODUCTION AND RESPIRATORY SYSTEM

- Anatomical positions, planes and terms, cell, tissue ,and organization of the body.
- Oral cavity, upper respiratory tract, nose, pharynx, larynx, vocal cord ,trachea, bronchi, lung, bronchopulmonary segments, pleura, diaphragm, thoracic cage with boundaries, intercostal space , and applied anatomy.
- Cell physiology, water and electrolyte balance-components of body fluid compartments, sodium, potassium, magnesium-function, homeostasis.
- Functions of the respiratory system, dead space, compliance, surfactant, control of ventilation, work of breathing, pulmonary circulation, lung volume and capacities, ventilation perfusion relationship, lung function test, causes of arterial hypoxia, pulse oximetry, types of respiratory failure.
- Pharmacology- common terminologies, basic principles, bioavailability, routes of drug administration and absorption, pharmacokinetics, pharmacodynamics, adverse effects. Oxygen, drugs used in asthma and COPD.

Unit-II CARDIOVASCULAR SYSTEM

- Pericardium clinical and applied anatomy, heart-anatomy, coronary circulation, blood and nerve supply, conducting system.
- Blood vessel structure, classification, arterial supply of body (aorta, common carotid).

- Arterial supply of upper limb ,hand ,abdomen, thorax, pelvis, lower limb.
- Venous drainage of body, SVC, IVC, upper limb, lower limb, thorax, abdomen and pelvis.
- Distribution of blood volume ,effect of blood loss, blood pressure and regulation of blood pressure, measurement of blood pressure, valsalva manoeuvre, cardiac output and its determinants, determinants of venous return, central venous pressure, pulmonary capillary wedge pressure, jugular venous pressure, cardiac cycle, heart sounds and auscultation, myocardial oxygen consumption, conduction system, ECG.
- Components of blood, functions of blood and plasma protein, function of iron, red blood cells, white blood cell, platelets, blood groups, blood transfusion indications and hazards, coagulation cascade, antihypertensives.
- Drugs used in ischemic heart disease.
- Anticoagulants, antiplatelets.
- Drugs used in cardiac failure, antiarrhythmic drugs, diuretics.
- Fluids and electrolytes-crystalloids, colloids, potassium, treatment of hypo and hyperkalemia, sodium, treatment of hypo and hypernatremia, calcium, magnesium. Inotropes, vasopressors, vasodilators, chronotropic agents.

Unit-III MUSCULO SKELETAL SYSTEM

- Bones- axial skeleton, appendicular skeleton, gross anatomy, cellular component, classification of bones, microscopic structure, blood supply.
- Cartilage-structure and type of cartilage.
- Joints- classification and type of joints.
- Muscular system.-types and classification of muscles.muscle relaxants, acetaminophen, NSAID.

Unit-IV GASTRO INTESTINAL AND GENITO URINARY SYSTEM

- Digestive system- oral cavity, oesophagus stomach, small and large intestines, liver, pancreas, spleen.
- Applied anatomy. Genitourinary system.-kidney, ureter, bladder, urethra, testis, ovary, uterus applied anatomy.
- Acid base balance-ph,factors affecting body ph,buffers,acid base disorders.
- Renal physiology-nephron, functions of the kidney, glomerular filtration, juxta glomerular apparatus, Bowmans capsule, loop of Henle, tubular function, counter current mechanism, tests of glomerular function, test of tubular function, renin angiotensin mechanism.
- Gastro oesophageal sphincter competence, mendelsons syndrome, vomiting, stomach - functions, liver - functions, liver function test, bilirubin metabolism, bile -production and function.
- Antacids, antiemetics, prokinetic agents, laxatives, antidiarrhoeals.

Unit-V CENTRAL NERVOUS SYSTEM AND ENDOCRINE SYSTEM

- Nervous system-parts of the nervous system, neuron, types of nerve and function, neuromuscular junction, cerebrospinal fluid, parts of the brain, cerebellum, spinal cord, autonomic nervous system.
- Thyroid, parathyroid, adrenal, pituitary.
- Thermoregulatory mechanism, body response to cold and heat, hypothermia, hyperthermia. - membrane potential, action potential, synapses, cerebral blood flow and regulation, blood brain barrier, intracranial pressure,
- Hyper and hypothyroidism, adrenal glands, insulin synthesis, action, deficiency, hypoglycemia, hyperglycemia, diabetic ketoacidosis.
- Atropine, glycopyrrolate, sedatives, antiepileptic, benzodiazepines, opioids, insulin, corticosteroids.

Text Books:

1. Human Anatomy , B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013 Textbook of physiology, A.K.Jain, Fifth edition, Avichal Publishing Company , 2014
2. Pharmacology for Dental and Allied Health Sciences, Padmaja Udaykumar, Third Edition, Jaypee Brothers Medical Publishers , 2013

Reference Books:

1. Human Anatomy , B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013
2. Textbook of physiology, A.K.Jain, Fifth edition, Avichal Publishing Company , 2014
3. Essentials of medical pharmacology, Tripathi, 7th edition, Jaypee Brothers Medical Publishers, 2013

ANATOMY, PHYSIOLOGY AND PHARMACOLOGY RELATED TO EMERGENCY
MEDICINE – PRACTICAL (UE)

OBJECTIVES

- To inculcate thorough knowledge on the anatomy and physiology of various organs and structures.
- To elaborate on various pharmacological aspects in relation to emergency medicine.

Specific Learning outcomes (SLO):

- Will be able to express anatomical terminologies with clarity.
- Will be able to recognize improper physiological functions.
- Will gain competency in handling emergency and trauma patients with knowledge on Pharmacological aspects

CONTENTS

- Charts related to Anatomical positions and Terminologies
- Spotters - Histology of skin slide , Radiographic Surface Anatomy
- Charts, Specimens and X-rays – Radiological and Anatomical Surface markings related to the following:
 - a) Head and Neck
 - b) Skeletal system of upper and Lower Limbs,
 - c) Thorax and Abdomen
 - d) Cardiovascular system
 - e) Respiratory system
 - f) Reproductive system
 - g) Alimentary System
 - h) Excretory system
- Identification of emergency drugs, Crystalloids and colloids

CLINICAL MICROBIOLOGY, PATHOLOGY AND BIOCHEMISTRY RELATED TO EMERGENCY MEDICINE – THEORY (UE)

OBJECTIVES

- To develop understanding of various pathological conditions in relation to emergency and trauma care.
- To introduce the importance of microbiology and biochemistry in emergency and trauma care. To elaborate on various pharmacological aspects in relation to emergency medicine.

Specific Learning Outcome (SLO):

- Will be able to explain various pathological conditions.
- Will be able to recognize variations in normal biochemical environment during an emergency or trauma.
- Will be able to identify changes occurring due to microbes with competency.

CONTENTS

Unit-I GENERAL MICROBIOLOGY

- Bacterial Genetics, Antibiotic action and Mechanisms of drug resistance (MRSA, ESBL, MBL),
- Bacterial food poisoning, bacterial diarrhea and dysentery, skin and soft tissue infections (aerobic and anaerobic),
- Respiratory tract infection, Urinary Tract infection, Sexually transmitted diseases, Congenital infections

Unit-II APPLIED MICROBIOLOGY

- Hospital Acquired infections, universal Precautions – Standard Infection control precautions, Biomedical Waste Management, Role of Infection Control Committee, Central Nervous system infections (Meningitis and encephalitis), Septicemia and Bacteremia, Blood borne viral infections – Hepatitis virus and HIV.

Unit-III BASIC PATHOLOGY

- Basic pathological processes.
- Degeneration, Necrosis, Cellular adaptation, Cell injury & cell death.

- Cellular response to stress and noxious stimuli. Causes of cell injury. Mechanisms of cell injury. Reversible and irreversible cell injury Examples of cell injury and necrosis Inflammation, Chemical mediators of inflammation,
- Chronic inflammation, Circulatory disturbances, Metabolic disorders.
- Physiology and Pathology of Immune system.
- Complement function, Hypersensitivity reaction, Immune complex diseases, Autoimmune disease. Genetic disorders.

Unit-IV PATHOLOGICAL TECHNIQUES TO ARRIVE AT DIAGNOSIS AND LABORATORY FOLLOW UP

- Malabsorption syndrome, Endocrine function tests.
- Tumor Markers: Diagnostic and prognostic values Collection, Transport and Examination of Body fluids Physical chemical and microscopic examination of Urine, Cerebrospinal fluid, Pleural, Peritoneal and Synovial fluids.
- Examination of Sputum, Technique and applications Some diagnostic techniques for Anatomic pathology, FNAC technique, Papanecoulau and Giemsa stain Technique of grossing, different histopathological staining techniques,
- Exposure to technique of electron microscopy Learning the Essence of histopathological reporting,
- Cytology to distinguish benign from malignant lesions.

Unit-IV CLINICAL BIOCHEMISTRY

- Biochemical Analytes in blood, biochemical analytes in urine, Biochemical analytes in cerebrospinal fluid, Biochemical analytes in ascetic fluid,
- Liver function tests, Kidney function tests, Gastric function tests,
- Acid Base Balance (Normal & abnormal) and interpretation of ABG parameters,
- Tumor markers, Point of care instruments and their role in ambulance.

Text Books:

1. Text book of pathology, Harsh Mohan, Second Edition, Jaypee Brothers Publishers, 2013
2. Textbook of Microbiology, Ananthanarayan and Paniker, Eight Edition, Universities Press, 2009.
3. Text book of biochemistry, Vasudevan, Seventh Edition, JP Medical Ltd, 2013

Reference Books:

1. Principles and practice of medicine, Davidson, Twenty Second edition, Elsevier Health Sciences, 2014

2. Lipponcott's Illustrated Reviews: Microbiology, Harvey, Third Edition, Lippincott Williams & Wilkins 2011
3. Text book of biochemistry, Vasudevan, Seventh Edition, JP Medical Ltd, 2013

CLINICAL MICROBIOLOGY, PATHOLOGY AND BIOCHEMISTRY RELATED TO EMERGENCY MEDICINE – PRACTICAL (UE)

OBJECTIVES

- To develop knowledge on various staining techniques on microorganism s.
- To develop knowledge on laboratory safety and infection control methodologies and effect of biochemical changes in humans

Specific Learning Outcome (SLO):

- Will be able to perform various staining techniques for interpretation of microorganisms.
- Will be able to demonstrate competency in interpretation of applied pathological aspects.
- Will be able to recognize variations in normal biochemical environment during an emergency or trauma

CONTENTS

- Basic Staining Techniques
- Interpretation of Gram Stain and Acid Fast Stain
- Charts related to Applied Microbiology
- Vaccines Spotters
- Color coded waste disposal
- Chemical Disinfectants spotters (Gluteraldehyde, formaldehyde, antiseptic solutions)
- Invasive Devices and their sterilization methods (IV sets, Endotracheal tubes, suction apparatus)
- Management of Blood Spillages
- Method of sample collection
- Charts Related to Basic pathological processes, immunopathology
- Charts related to procedures related to chemical and microscopic examination of body fluids
- Demonstration of point of care instruments
 - a) Glucometer (Includes both blood glucose & ketones estimation)
 - b) Triage (Trop I, BNP, CKMB)
 - c) ABG
 - d) Electrolyte analyser
- Charts on interpretation of emergency cases & relevant investigations to be analysed

MEDICAL ETHICS AND BIO SAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tampo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and

Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

| S.No | SUBJECT |
|-------------|---|
| 1 | Trauma Care - First Aid, Triage, Life Support, and Resuscitation - Theory (UE) |
| 2 | Trauma Care - First Aid, Triage, Life Support, and Resuscitation - Practical (UE) |
| 3 | Emergency Medical Equipment, Cardiopulmonary Emergencies and Poisoning - Theory (UE) |
| 4 | Emergency Medical Equipment, Cardiopulmonary Emergencies and Poisoning - Practical (UE) |
| 5 | Pre Hospital Care Record Documentation(IE) |
| 6 | Sociology(IE) |

SEMESTER-IV

TRAUMA CARE - FIRST AID, TRIAGE, LIFE SUPPORT, AND RESUSCITATION - THEORY (UE)

OBJECTIVES

- To develop in depth knowledge on First aid techniques and Triage
- To develop exhaustive ideology of various life support methods and resuscitation

Specific Learning Outcome (SLO):

- Will be able to explain first aid techniques for various emergency conditions.
- Will be able to explain triage during an emergency outcome.
- Will be able to provide better support during a lifesaving condition with knowledge on life support and resuscitation.

Unit-I PRINCIPLES OF FIRST AID

- Airway-list the signs of adequate breathing, list the signs of inadequate breathing. Describe the steps in performing the head-tilt chin-lift, relate mechanism of injury to opening the airway.
- Describe the steps in performing the jaw thrust, state the importance of having a suction unit ready for immediate use when providing emergency care.
- Describe the techniques of suctioning. Describe the steps in performing the skill of artificially ventilating a patient with abag-valve-mask while using the jaw thrust.
- List the parts of a bag-valve-mask system. Describe the steps in performing the skill of artificially ventilating a patient with a bag-valve-mask for one and two rescuers.
- Describe the signs of adequate artificial ventilation using the bag-valve-mask.
- Describe the signs of inadequate artificial ventilation using the bag-valvemask, list the steps in performing the actions taken when providing mouth-to-mouth and mouth-to-stoma artificial ventilation.
- Describe how to measure and insert an oropharyngeal (oral) airway. Describe how to measure and insert a nasopharyngeal (nasal) airway.
- Define the components of an oxygen delivery system.
- Identify a nonrebreather face mask and state the oxygen flow requirements needed for its use.
- Describe the indications for using a nasal cannula versus a nonrebreather facemask. Identify a nasal cannula and state the flow requirements needed for its use.

- Wounds-basic principles of wound dressing,, haemorrhage, shock ,fracture, dislocations, muscle injuries ,splinting.
- Unconsciousness basic nursing care of unconscious patient.
- Burns, scalds, foreign bodies in the skin, eye, ear, nose, throat, stomach ,frost bite, effects of heat cramps, .lifting and transporting injured persons ,bandaging -figure of eight, spiral, spiral reverse, circular, recurrent, practical guidelines for applying a roller bandage physical assessment

Unit-II TRIAGE, BASIC AMBULANCE SERVICES

- Types of triage, prehospital care, basic life support, transportation to hospital, basic ambulance service.
- Shifting of patient define body mechanics discuss the guidelines and safety precautions that need to be followed when lifting a patient.
- Describe the safe lifting of cots and stretchers.
- Describe the guidelines and safety precautions for carrying patients and/or equipment,describe correct and safe carrying procedures on stairs.
- Emergency move, urgent move, non-urgent move.

Unit-III TRAUMA CARE

- Initial assessment and management - primary survey/secondary survey –who six phases of trauma care management.
- Chest injuries –indication for chest decompression, open chest wounds, tension pneumothorax, and chest drains-under water seal, hypovolemic shock –assess circulation, signs of hypoperfusion, monitoring, bleeding control of external haemorrhage, fluid resuscitation. Intravenous access, oxygen supplementation, venous cut down.
- Head injuries –glasgow coma scale.
- Pupil size-method to asses pupil size, normal and abnormal pupil size, differentiate between dilated and constricted pupil, differentiate between reacting and nonreacting pupil.
- Maxillofacial injuries –basic nursing care.
- Spine and spinal cord –rule out unstable cervical spine, spine immobilization, log rolling,
- Abdomen –peritoneal lavage, ryles tube insertion.
- The urinary tract-bladder catheterization, Limb injuries –basic nursing care.
- Trauma in pregnancy –basic nursing care.
- Paediatric trauma – basic nursing care.
- Trauma in elderly –basic nursing care.

- Management of severe burns –assess percentage of burns, degree of burns, Decontamination, dressing.

UNIT-IV VITAL SIGNS

- Temperature -definition and normal body temperature, factors affecting normal body temperature, assessment of normal body temperature.
- Pulse - definition and normal pulse rate, characteristics of normal pulse, factors influencing pulse, alterations in pulse, assessment of pulse.
- Respiration - definition and normal respiratory rate, characteristics of normal respiration, factors influencing respiratory rate, alterations in respiration, assessment of respiration.
- Blood pressure –define systolic and diastolic blood pressure - Definition and normal blood pressure, factors influencing normal blood pressure ,assessment of blood pressure ,alterations in blood pressure

UNIT-V LIFE SUPPORT

- Basic life support in perspective, cardiopulmonary function and actions for survival,
- adult basic life support,
- special resuscitation situations ,
- pediatric basic life support ,
- safety during cpr training and actual rescue.

Text Books:

1. First Aid For Nurses, Karesh Prasad, First edition, Jaypee Brothers Medical Publishers Ltd, 2012
2. Text book on first aid and emergency nursing, I.Clement, first edition, Jaypee Brothers Medical Publishers Ltd, 2013
3. American College of Emergency Physicians First Aid Manual, Jon R. Krohmer, second edition, DK publishers, 2004

Reference Books:

1. Emergency and Trauma Care for Nurses and Paramedics, Kate Curtis, revised edition, Elsevier Health Sciences, 2011
2. Oxford Handbook of Accident and Emergency Medicine, Jonathan P. Wyatt, illustrated edition, Oxford University Press, 2005
3. Oxford Handbook of Critical Care, Andrew Webb, illustrated edition, Oxford University Press, 2009

TRAUMA CARE - FIRST AID, TRIAGE, LIFE SUPPORT, AND RESUSCITATION - PRACTICAL (UE)

OBJECTIVES

- To inculcate thorough knowledge on life support skills
- To elaborate on various first aid techniques and triage

Specific Learning outcomes (SLO):

- Will be able to gain hands on training on life support techniques.
- Will be able to recognize Triage levels during an emergency outcome.
- Will be able to show competency in handling emergency and trauma patients with knowledge on first aid and resuscitation methods.

CONTENTS

- Basic Life Support
- Advanced Cardiac Life Support
- Skill Of Artificial Ventilation
- Triage
- Vital Signs Measurement Using Monitors And Normal Values
- Blood pressure using sphygmomanometer
- Setting up of iv infusion
- Hypovolemic shock and management
- Application of bandage
- Application of splint
- Cervical spine immobilisation.

EMERGENCY MEDICAL EQUIPMENT, CARDIOPULMONARY EMERGENCIES AND POISONING – THEORY (UE)

OBJECTIVES:

- To develop understanding of medical equipment related to emergency and trauma care.
- To introduce the importance of cardiopulmonary emergencies and poisoning

Specific Learning outcomes (SLO):

- Will be able to work with medical equipment related to emergency medicine.
- Will be able to show competency in working with poisoned patients extending support to the emergency physician.
- Will be able to identify pathological and biochemical changes with competency in cardiopulmonary emergencies

CONTENTS

Unit-I EMERGENCY MEDICAL EQUIPMENT

- ECG , DC defibrillator ,
- intravenous pumps laryngoscope,
- ambubag, suction machine ,
- SPO2 monitoring,
- temperature monitoring ,
- BP apparatus,
- BP monitoring-NIBP, IBP ,ventilators-intensive care, portable ,
- manual resuscitator ,
- radiology equipment & radiation hazards ,
- suction machine ,
- nebuliser ,
- medical gases,
- infant warmer & incubator ,
- glucometer.

Unit-II GENERAL PRINCIPLES FOR THE TREATMENT OF POISONING

- General principles of assessment and management of poison and overdose ,gastric lavage, forced alkaline diuresis, -opiates toxicity, organophosphates, carbon monoxide, cyanide,

caustics, copper sulphate, digoxin toxicity, hydrocarbons, tricyclic toxicity, metals, acetaminophen overdose, poisonous alcohols, poisonous plants

Unit-III EMERGENCIES DUE TO VENOMOUS BITES AND STINGS

- Snake bite anti-venom administration,
- scorpion stings,
- bee and wasp stings-anaphylaxis management,
- dog bite

Unit-IV CARDIAC EMERGENCIES

- Acute coronary syndromes including angina and myocardial infarction, heart failure, arrhythmias, hypertensive emergencies

Unit-IV RESPIRATORY EMERGENCIES

- Asthma, COPD, Tension Pneumothorax, Pneumonia ,Respiratory failure.

Text Books:

1. Oxford Handbook of Accident and Emergency Medicine, Jonathan P. Wyatt, illustrated edition, Oxford University Press, 2005
2. Oxford Handbook of Critical Care, Andrew Webb, illustrated edition, Oxford University Press, 2009
3. Drugs and Equipment in Anaesthetic Practice, Arun Kumar, sixth edition, Elsevier India, 2004

Reference Books:

1. Principles and practice of medicine, Davidson, Twenty Second edition, Elsevier Health Sciences, 2014

EMERGENCY MEDICAL EQUIPMENT, CARDIOPULMONARY EMERGENCIES AND POISONING – PRACTICAL (UE)

OBJECTIVES

- To develop understanding of medical equipment related to emergency and trauma care.
- To introduce the importance of cardiopulmonary emergencies and poisoning.

Specific Learning outcomes (SLO):

- Will be able to identify and utilize medical equipment during an emergency or trauma.
- Will be able to demonstrate competency in anaphylaxis management in support to a physician.
- Will be able to gain knowledge on drugs used for various cardiopulmonary emergencies

CONTENTS

- Identify the different emergency equipment
- Functions of Emergency Medical Equipment
- Parts of laryngoscope
- Ambu
- Defibrillator
- Clinical features of poisoning and first aid
- Antidotes for common poisoning
- Anaphylaxis management
- Drugs used in acute MI
- Drug used in heart failure
- Drug used in asthma
- Drug used in COPD.

PRE HOSPITAL CARE RECORD DOCUMENTATION (IE)

Learning Objective:

- Able to understand the Documentation and its importance with current emphasis on monitoring the quality of health care as evidenced by patient outcome.
- Emphasize on accurate and adequate documentation Minimization of errors

Unit I

- Understand the importance of written documentation of patient care rendered
- Components of the prehospital care report

Unit II

- Continuity of care often depends on documentation from the previous health care provider.
- The Prehospital care report is a legal document
- General guiding principles for documentation

Unit-III

- Procedure – Subjective, objective, assessment and pain
- Prehospital care report for billing and statistical information

Unit-IV

- Evaluation and continuous quality improvement
- Errors made while documenting

Text Books:

1. Mosby's Paramedic book ,Mick J Sanders ,Lawrence M Lewis, Gary quick Fourth edition 2014
2. Caroline emergency care in streets essentials eighth edition, American Academy of Orthopaedic Surgeons , Nancy L. Caroline .

SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication

4. Johnson R.M, Systematic Introduction to Sociology, 1960, Allied Publishers
5. Cultural Anthropology, Barbara D. Miller, 2006 Pearson/Allyn and Bacon Co
6. C.N. Shankar Rao., Introduction to Sociology, 2008, S. CHAND & Company Publications.

SEMESTER V

| S.No | Subject |
|-------------|---|
| 1. | Orthopaedic Emergencies, burns and Surgical Emergencies– Theory (UE) |
| 2. | Orthopaedic Emergencies, burns and Surgical Emergencies– Practical (UE) |
| 3. | Obstetrics, Gynaecological and Paediatric Emergencies - Theory (UE) |
| 4. | Obstetrics, Gynaecological and Paediatric Emergencies - Practical (UE) |
| 5. | Environmental science and community medicine(IE) |

V SEMESTER

ORTHOPAEDIC EMERGENCIES, BURNS AND SURGICAL EMERGENCIES– THEORY (UE)

Objectives:

- The student should gain knowledge and recognition of major abdominal illness and trauma, ask for relevant investigations, so as to avoid any delay in resuscitation.
- Able to understand the surgical procedures which are commonly categorized by urgency, type of procedure, body system involved degree of invasiveness, and special instrumentation.

Specific Learning Outcomes:

- Be able to gain knowledge and recognition of major abdominal illness and trauma, ask for relevant investigations, so as to avoid any delay in resuscitation.
- Be able to understand the surgical procedures which are commonly categorized by urgency, type of procedure, body system involved degree of invasiveness, and special instrumentation.

CONTENTS

UNIT I

- **Principles of Anaesthesia:**
 - General Anaesthesia
 - Local Anaesthesia
 - Regional Anaesthesia
- **Wounds and Suturing:**
 - Types of common wounds
 - Treatment
 - Cleansing the wound
 - Wound healing
 - Principles of incision and closure (including suturing)

- **Burns**
 - Skin Anatomy
 - Classification of Burn
 - Special Burn considerations

UNIT II

- **Acute Abdominal Pain**
- **Esophageal Obstruction and Foreign Bodies**
 - Site
 - Radiographic consideration
 - Esophageal pharmacologic Maneuvers
 - Foley catheter manipulation of Esophageal Foreign Bodies
 - Special situations: Fish Bones in the Throat
 - Button Battery ingestion
 - Childhood coin ingestion
- **Gastrointestinal Bleeding**
 - Upper GI Bleed
 - Lower GI Bleed
- **Stomach**
 - Anatomy and physiology
 - Peptic ulcer: Aetio pathogenesis
 - Clinical features
 - Difference between duodenal and gastric ulcer
 - Investigations and Treatment

UNIT III

- **Cholecystitis**
 - Definition
 - Pathophysiology
 - Causes
 - Signs and symptoms
 - Investigations
 - Treatment
- **Pancreas:**
 - Histology

- Acute Pancreatitis:
 - Definition
 - Pathophysiology
 - Causes
 - Signs and symptoms
 - Investigations
 - Treatment
- Chronic Pancreatitis:
 - Aetiology
 - Clinical features
 - Investigations
 - Treatment

UNIT IV

- **Appendix**

- Acute Appendicitis: Pathology
 - Clinical features
 - Physical Examination
 - Investigations
 - Treatment

- **Intestinal obstruction**

- **Abdominal Trauma:**

- Solid viscus injuries (Liver, Spleen, Kidney)
 - Hollow viscus injuries (Intestines, Urinary bladder)
 - Vascular injuries in the abdomen
 - Diaphragmatic rupture
 - Evisceration
 - Mesenteric avulsion, Hematoma

UNIT V

- **Anorectal Disorders**

- **Renal Colic:**

- History

- Causes
- Presentation
- Examination of the Kidney
- Investigations
- Management

UNIT VI

- Torsion Testis
- Special emergency surgical procedures

Text Books

1. A manual on clinical surgery, 7th edition S Das-Dr.S.Das
2. Manipal manual of Surgery, 2nd edition, K.RajgopalShenoy-CBS Publishers

Reference Books

1. Bailey and Love's short practice of surgery – 24th edition
2. Handbook of surgery – Sudhirkumar Jain , VivekManchandra Raman Tanwar

Online Resources

1. [www. emedicine](http://www.emedicine.com) - Medscape reference
2. [WWW. WebMD](http://www.webmd.com) reference

ORTHOPAEDIC EMERGENCIES, BURNS AND SURGICAL EMERGENCIES– PRACTICALS (UE)

Objectives:

- Be able to gain knowledge and recognition of major abdominal illness and trauma, ask for relevant investigations, so as to avoid any delay in resuscitation.
- Be able to understand the surgical procedures which are commonly categorized by urgency, type of procedure, body system involved degree of invasiveness, and special instrumentation.
 - Assisting in various procedures like:
 - Central Venous Access
 - Suturing of Wounds
 - Tracheostomy
 - Intercostal Drainage
 - Needle Thoracocentesis
 - Cricothyrotomy

SPOTTERS

- Thermometer
- BP apparatus
- Stethoscope
- Glucometer
- Intraosseous infusion
- LMA
- Combitube
- ET intubation
- Nebuliser
- Ventilator
- Capnography
- Pulse oximeter

OBSTETRICS, GYNAECOLOGICAL AND PAEDIATRIC EMERGENCIES - THEORY (UE)

Objectives:

- The student is able to assess the physical changes that take place in a child bearing woman.
- The students gain knowledge on the specific injuries that can occur in pregnancy.

Specific Learning Outcomes:

- Be able to assess the physical changes that take place in a child bearing woman.
- Be able to gain knowledge on the specific injuries that can occur in pregnancy.

UNIT I

- Anatomy of female reproductive system
- Menstrual cycle
- Physiological changes during pregnancy
- **Diagnosis of pregnancy**
 - First trimester
 - Second trimester
 - Last trimester
 - Differential diagnosis of pregnancy
- Antenatal Assessment
- Antenatal Assessment of fetal well being

UNIT II

- **Vomiting in Pregnancy**
 - Hyperemesis Gravidarum
 - Clinical Courses
 - Management
- **Haemorrhage in Early Pregnancy**
 - Abortion
 - Ectopic pregnancy

- **Hypertensive Disorders in Pregnancy**
 - Pre Eclampsia
 - Eclampsia
 - Essential Hypertension in Pregnancy
- **Antepartum Haemorrhage**
 - Placenta Praevia
 - Abruptio Placenta

UNIT III

- **Medical and Surgical Illness in Pregnancy**
 - Anaemia in pregnancy
 - Glycosuria in pregnancy
- **Normal Labour**
 - Causes of Onset
 - Physiology
 - Mechanism
 - Management

UNIT IV

- **Preterm Labour**
 - Etiology
 - Clinical Courses
 - Management
- **Premature Rupture of the Membranes**
- **Intrauterine Foetal Death**

UNIT V

- **Malposition, Malpresentation, Cord Prolapse**
 - Occipito posterior position
 - Breech presentation
 - Face presentation
 - Brow presentation
 - Cord prolapse
 - Transverse lie
- **Prolonged labour and obstructed labour**
 - Causes
 - Diagnosis
 - Treatment

- **Complication of Third Stage of Labour**

- Post Partum Hemorrhage
- Retained Placenta
- Inversion of Uterus

UNIT VI

- **Injuries to Birth Canal**

- Medical
- Surgical
- Combined

- **Pharmacotherapeutics in Obstetric**

- Oxytocin
- Analgesia and Anaesthesia

- **Trauma in Pregnancy**

- Mechanism
- Assessment and Management.

- **Emergency Department Cesarean Section**

UNIT VII

- **Comparative anatomy:**

- Comparative anatomy between adult & pediatric
- History taking and pediatric assessment
- Developmental milestones
- Anthropometry
- Neonatal resuscitation
- Pediatric resuscitation
- Assessment of newborn and pediatric

UNIT VIII

- **Pediatric fluid and metabolic derangements**

- Hypoglycemia,
- DKA
- Dehydration
- Fluid therapy

- **Management of Injured child**

- Primary survey
- Resuscitation

- Secondary survey
- Emergency treatment
- **Gastrointestinal emergencies**
 - Diarrhea
 - Abdominal pain

UNIT IX

- **Cardiovascular emergencies:**
 - Shock
 - Arrhythmias
- **Respiratory emergencies:**
 - Foreign body obstruction
 - Asphyxia neonatorum
 - Bronchiolitis
 - Pneumonia
 - Asthma
 - Croup
 - Epiglottitis
- **Neurological emergencies**
 - Neonatal Seizure
 - Febrile convulsion
 - Meningitis

Text Books

1. Textbook of Obstetrics 6th edition, Dutta-New central book Agency
2. Mudaliar and Menon Clinical Obstetrics-10th edition, Sarala Gobalan & Vanitha Jain-Orient Longman
3. Essentials of Obstetrics, 1st edition, Sabarathnum Arulkumaran, V. Sivanesarathnum-Jaypee

Reference Books

1. Textbook of obstetrics, Sheik Balakrishnan – 1st edition, Hawkins and Bourne
2. Shaw's textbook of gynecology – 18th edition, V.G. Padubidri, S.N Daffary
3. Manual of Obstetrics – 3rd edition, Shirish N Daffray, Sudip Chakravarti

Online Resources

1. www. emedicine - Medscape reference
2. WWW. WebMD reference

OBSTETRICS, GYNAECOLOGICAL AND PAEDIATRIC EMERGENCIES - PRACTICAL (UE)

Objectives:

- Be able to remember the basic outline on how to diagnose and administer care or to recognize, prevent and treat various emergencies that commonly occur in children.
- Be able to demonstrate the special considerations and skills while handling pediatric patients.

PRACTICALS

- History Taking, examination & Presentation of Pregnant women
- History taking, examination and presentation of paediatric case.
- Assessment of newborn and pediatric
- Pediatric resuscitation/ Neonatal Resuscitation

Text Books

1. Nelson Textbook of paediatrics 18th edition ,Kliegman ,Behrman,Jenson-Saunders Elsevier
2. Care of new born –6th edition,Meharban Singh-Sagar
3. Essential Pediatrics-7th edition O.P. Ghai, VinodK.Paul-CBS publisher
4. IAP book of pediatrics,3rd edition, A.Parthasarathy, Nair-Jaypee

Reference Books

1. Textbook of pediatrics Emergency medicine Fleischer – Ludwig Bachur, Goelik ruddy show.
2. P.E.M concepts and clinical practice – 2nd edition - Roger M. Barkin , Grace L. CapatoDavid M. Jaffe, Jane F. Knapp, Robert W. Schafermayer, James S. Reidel.

ENVIRONMENTAL SCIENCE AND

COMMUNITY MEDICINE (IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health,

Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology**: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health**: Definition & Components (environment sanitation environmental sanitation) Water : Safe & wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

Air pollution & its effects. Prevention & Control of air pollution

Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

RECOMMENDED TEXT BOOKS:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

Reference:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

SEMESTER VI

| S.No: | Subject |
|--------------|--|
| 1. | Clinical procedures and instruments emergency services course description - Theory (UE) |
| 2. | Clinical procedures and instruments emergency services course description - Practical (UE) |
| 3. | Critical Care and Disaster Management - Theory (UE) |
| 4. | Critical Care and Disaster Management - Practical (UE) |
| 5. | Healthcare and basic principles (IE) |

SEMESTER VI
CLINICAL PROCEDURES AND INSTRUMENTS IN EMERGENCY
SERVICES -THEORY (UE)

- This course is designed to help the students to develop an understanding of the philosophy, objectives, theories and process of accident and emergency care technology in various Supervised Clinical settings.
- It is aimed at helping the students to acquire knowledge, understanding and skills in techniques of practice them in Supervised Clinical settings

INSTRUMENTATION IN EMERGENCY SERVICES

- **Introduction to Biomedical engineering (Man – machine relationship)**
 - ECG
 - DC Defibrillator
 - Intravenous pumps
 - Laryngoscope, ambubag, suction machine
 - SPO2 monitoring, Temperature monitoring
 - BP apparatus, BP monitoring-NIBP, IBP
 - Ventilators-Intensive care, portable
 - Power generation, transmission & distribution
 - Manual resuscitator
 - Radiology equipment & radiation hazards
 - Suction machine
 - Nebulizer
 - Medical gases
 - Ambulance and its power supply
 - Dialysis machine
 - Infant warmer & incubator

CLINICAL PROCEDURES IN EMERGENCY ROOM

- **Vital Sign Measurement**
 - Pulse assessment
 - Respiratory assessment
 - Temperature assessment
 - Blood pressure assessment

- Respiratory procedures
 - Endotracheal intubation and extubation
 - Drugs through ET tube
 - Tracheostomy insertion and management
- Suctioning an artificial airway
 - Naso tracheal suctioning
 - Insertion of nasopharyngeal and oropharyngeal airway
 - Mechanical ventilation
 - Intercostal drain
 - Age
 - Thoracocentesis
- Intermediate Airways
 - Laryngeal Mask Airway
 - Esophageal – Tracheal Combitube
- Non invasive Assessment and Support of Oxygenation and Ventilation
 - Pulse oximetry
 - Carbon dioxide Monitoring --> Capnometry
 - Oxygen therapy
 - Delivery systems for Inhaled Medication – Nebulizers – Metered Dose Inhaler
- Cardiovascular procedures
 - Cardiac Monitoring
 - Central venous pressure monitoring
- Insertion of Arterial line
 - Central venous cannulation
 - Transcutaneous cardiac pacing
 - Transvenous cardiac pacing
 - Pericardiocentesis
 - Cardioversion
 - Defibrillation
- Cannulating Umbilical Vein
 - Indication
 - Procedure
 - Drugs through umbilical vein
 - Complication
- Intraosseous Infusion
 - Indication
 - Procedure
 - Drugs through intraosseous line
 - Complication
- Gastrointestinal procedures

- Insertion of nasogastric tube
- Insertion of enteral feeding tube and initiation of feedings
- Gastric lavage
- Upper gastrointestinal endoscopy
- Insertion of rectal tube
- Paracentesis
- Peritoneal lavage
- Poison decontamination
 - Activated charcoal
 - Whole bowel irrigation
- Genitourinary procedures
 - Urethral catheterization
 - Peritoneal dialysis
 - Placement and Management of external Arteriovenous shunt.
 - Continuous Arteriovenous hemofiltration
- Intravenous Therapy
 - Insertion of intravenous catheter
 - Administration of parenteral nutrition
 - Blood administration
- Neurologic Procedures ○ Lumbar Puncture

Text book:

1. Emergency care in the streets- Nancy Caroline
2. Selva Rose. 1997, Career English for Nurses. Published by: Orient Blackswan Ltd
3. Oxford advanced Learners Dictionary, 1996
4. Quirk Randolph and Greenbaum Sidney, 1987. A University Grammar of English, Hong Kong: Longman group (FE) Ltd/ Pearson.
5. Fundamentals of computers- V. Rajaraman-2004
6. Absolute beginners guide to computer basics-Michael Miller. Que Publisher, September 1, 2009.
7. Networking concepts and technology – by Deepak Kalkadia, Francesco DiMambro, Prentice hall publisher, May 25, 2007
8. Operation system concepts (8th edition) by Abraham Silberschatz, Peter Baer Galvin, Greg Gangne, Wiley Publisher, Feb 13, 2009.

CLINICAL PROCEDURES AND INSTRUMENTS IN EMERGENCY SERVICES - PRACTICALS (UE)

OBJECTIVES:

- To know the latest equipment, devices drug therapies and techniques used in emergency room
- Explains not only how to perform each procedure but also why, when and what other procedures you should consider.
- Able to demonstrate when to perform every type of emergency procedure and implement the best possible approach for every patient

PRACTICALS

- ECG
 - Power supply testing
 - Fuses testing

Spot identification

- Thermometer
- BP apparatus
- Stethoscope
- Glucometer
- Intraosseous infusion
- LMA
- Combitube
- ET intubation
- Nebuliser
- Ventilator
- Capnography
- Pulse oximeter

CRITICAL CARE AND DISASTER MANAGEMENT -THEORY (UE)

Learning Objectives:

- To know about inclusion of clinical decision making in medical curricula is needed to improve decision making in critical care.
- To demonstrate the most common techniques applied by emergency physicians in critically ill patients
- To understand the common emergencies encountered in emergency department.
- Identify the critical need to establish healthcare preparedness for disaster.
- Define “all Hazards” and list possible etiologies.
- Define disaster and Mass casualty incident
- Able to select, justify and interpret clinical tests and imaging.

Critical concepts and decision making

UNIT I

- Basic life support:
- Advanced cardiac life support
- Trauma life support

UNIT II

- **Decision making in**
 - Fatigue
 - Edema
 - Diaphoresis
 - Chronic pain
 - Red eye
 - Rhinitis
 - Tinnitus
 - Bradycardia
 - Tachycardia
 - Angina
 - Murmur

UNIT III

- Hypertension
- Hypotension
- Palpitations
- Syncope
- Congestive cardiac failure
- Acute pulmonary edema
- Cor pulmonale
- Dyspnoea
- Myocardial infarction

UNIT IV

- Hypoglycemia
- Hyperglycemia
- Hypothermia
- Hyperthermia
- Acute abdominal pain
- Nausea
- Vomiting
- Anorexia
- Dysphagia
- Heart burn

UNIT V

- Non cardiac chest pain
- Dyspepsia
- Jaundice
- Ascites
- GI bleeding
- Rectal bleeding
- Diarrhea
- Constipation
- Obstipation
- Flatulence
- Irritable bowel syndrome

UNIT VI

- Electrolyte imbalance

- Acid base imbalance
- Normal laboratory values
- Metabolic disturbance

Disaster management

UNIT VII

- Basic perspective on disaster
- Triage
- Principles of Hospitals disaster planning
- Emergency medical services in disaster

UNIT VIII

- Natural disasters
 - Earthquakes
 - Tornadoes
 - Hurricanes
 - Winter storm
 - Floods
 - Firestorm and Wild fires
 - Tsunamis
 - Volcanic eruptions
 - Heat related disaster

UNIT IX

- Manmade disasters
 - Hazardous material emergencies
 - Radiation injuries
 - Air crash disaster
 - Maritime disasters
 - Derailing
 - Terrorist bombing
 - Fire and burn care
 - Chemical disasters
- Biologic Weapons
- Mass shooting

- Research in disaster management

UNIT X

- Industrial Hazards
 - Electrocution
 - Amputation
 - Crush injury
 - Fall from height
 - Assaults

UNIT XI

- Occupational hazards and injuries

Text Books

1. Nancy Caroline's emergency care in streets 6th edition, Editor Andrew N. Pollak Jones and Bartlett publishers
2. Decision making in medicine – 3rd edition Harry L. Greene, Stuart B. Muslin-Elsevier
3. Critical care medicine – 3rd edition, Joseph E. Parrillo & R. Philip Dellinger-Elsevier
4. Disaster medicine - 2nd edition David E. Hogan, Jonathan Lippincott Williams and Wilkins
5. Rosen's emergency medicine 7th edition Marx, Hockberger, Walls, Adams-Mosby Elsevier

Reference Books

1. Ambulance Operation – Emergency Care – Emergency care, 12th edition Limmer and O'Keefe

CRITICAL CARE DISASTER MANAGEMENT -PRACTICAL (UE)

Objectives:

- Be able to understand the common emergencies encountered in emergency department.
- Be able to engage and communicate with patient.
- Be able to diagnose clinical problems
- Be able to identify need to establish health care preparedness for disaster.

PRACTICALS

1. Basic Life Support
2. Use of the Defibrillator, arrhythmia recognition and management
3. Removal Of Crash Helmet
4. Wireless communication
5. Triage evaluation & Examination (Triage Tags)
6. KED

HEALTH CARE AND BASIC PRINCIPLES (IE)

UNIT-I Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

UNIT-II Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

UNIT-III Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

UNIT-IV Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

UNIT-V Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

UNIT-VI Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

UNIT-VII Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

UNIT-VIII Health Insurance

REFERENCE BOOKS:

1. Principles of Hospital Administration and Planning, BM Sakharkar, 2nd edition, Jaypee Brothers, Medical Publishers Pvt. Limited, 2008
2. Hospital Administration And Management : Theory And Practice, R. Kumar S.L. Goel, Deep and Deep Publications, 2007
3. Principles of Management, Mason Andrew Carpenter, Talya Bauer, 3rd edition, Flat World Knowledge, L.L.C., 2010

SEMESTER-VII

| S.NO | SUBJECT |
|-------------|--|
| 1 | Project/ Dissertation |
| 2 | Biostatistics and research methodology |

SEMESTER-VII
BIOSTATISTICS AND RESEARCH METHODOLOGY

UNIT-I Statistics Definition and Terms

- What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability :

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution :

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation :

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK Mahajan Jaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S Sundar Rao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publicatons pvt ltd, 2008
4. Introductory Statistics. Prem S.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences, Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)
MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. MEDICAL LABORATORY TECHNOLOGY

Regulations, Curriculum and Syllabus 2017



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology

- ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

**16. Pattern of Semester - End Examination (University/Department):
EXAMINATION PATTERN-**

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY **MAX.MARKS-** 60 Marks **DURATION** -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment**20 marks**

- Based on CAT Exams

TOTAL**100 Marks****Practicals Pattern****Max marks:80**

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment**Max marks:20**

- Based on CAT Exams
- Attendance
- Log book

TOTAL**100 Marks****17. Marks Qualifying for a Pass:**

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.

- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|--------------|-----------------|------------------------|------------------|--|------------------|---|------------------|--------------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 400

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|--------------|------------------|-------------------------|------------------|--|------------------|---|------------------|--------------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SCHEME OF EXAMINATION

SEMESTER – III (MEDICAL LABORATORY TECHNOLOGY)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---------------------------------|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Histopathology – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Histopathology – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Cytology – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Cytology – Practicals (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (MEDICAL LABORATORY TECHNOLOGY)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical Pathology(Hematology & Urine Analysis) -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Clinical Pathology(Hematology & Urine Analysis) -Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Blood Banking & Immunology – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Blood Banking & Immunology- Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Basics and Advanced Life support (IE) | 30 hours | - | - | - | - | 50 | 50 |
| 6. | Sociology (IE) | 30 hours | - | - | - | - | 50 | 50 |

SEMESTER –V (MEDICAL LABORATORY TECHNOLOGY)

Total Hours: 390 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | General Bacteriology, Immunology and Systematic Bacteriology – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | General Bacteriology, Immunology and Systematic Bacteriology – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Virology , Mycology and Parasitology -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Virology , Mycology and Parasitology - Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Community medicine (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (MEDICAL LABORATORY TECHNOLOGY)

Total Hours: 390 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical Chemistry I - Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Clinical Chemistry I - Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Clinical Chemistry – II – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Clinical Chemistry II – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Healthcare and basic Principles(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|-------------------------------------|------------------|-----------|-----------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination | | Total |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation | - | - | 100 | - | 100 | - | 200 |
| 2. | Statistics and research methodology | 30 hours | - | - | - | - | 50 | 50 |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

OBJECTIVES:

Upon successful completion of the course Medical Laboratory Technologist, the student should be able to Perform routine clinical laboratory procedures within acceptable quality control parameters in Hematology, Clinical Chemistry, Immunohematology, and Microbiology under the general supervision of a Clinical Laboratory Scientist or Pathologist. They also will be able to Apply systematized problem solving techniques to identify and correct procedural errors, identify instrument malfunctions and seek proper supervisory assistance, and verify the accuracy of laboratory results obtained. They also Operate and maintain laboratory equipment, utilizing appropriate quality control and safety procedures. MLT students will perform laboratory test procedures accurately and efficiently. MLT students will analyze diverse types of information to choose an appropriate course of action in order to perform laboratory tests and solve problems accurately and efficiently.

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large

muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi
- c. Biceps
- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye ballSS

6. Viva Voce

- a. Radiology – Xrays

- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II, III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure, classification of nerve fibres,
- Muscles- classification, structure, Neuro-Muscular junction (NMJ).
- Muscle contraction-mechanism, types.

Ic. Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphology and functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition & functions of gastric juice.

- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II.Estimation of Hemoglobulin

III.RBC

IV.WBC

V.Spotter's

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,

- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy

- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM

- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**
 - Spotter

- **GROSS (SPOTTER)**
 - Fatty liver
 - Lipoma
 - Dry gangrene foot
 - Wet gangrene bowel
 - CVC Spleen
 - Hydatid cyst
 - TB – Lung

- **INSTRUMENTS**
 - Westergrens ESR tube
 - Sahlihemocytometer
 - Neubaur's chamber
 - Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**
 - Pituitary gland
 - Pineal body
 - Thyroid & parathyroid gland
 - Adrenal
 - Pancreas
 - Gonads – Ovary & Testis
- **Cardio-Vascular System**
 - Heart
- **Lymphatic system**
 - Spleen
- **Respiratory System**
 - Lungs
 - Larynx
 - Trachea
- **Digestive System**
 - Salivary glands
 - Esophagus
 - Pharynx
 - Stomach
 - Liver, Gall bladder
 - Duodenum
 - Small intestine
 - Large intestine
- **Urinary system**
 - Kidneys
 - Ureter
 - Urinary bladder
- **Reproductive System**
 - Saggital section – Male & Female pelvis
 - Uterus & ligaments
 - Ovary
 - Prostate
 - Seminal vesicals

- Vas deferens
- Testis
- **Viva Voce**
 - Radiology – Xrays
 - Osteology
 - Charts
 - Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition, normal values, intrapulmonary and intra pleural pressures, surfactant.
- Oxygen transport, carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia, cyanosis, Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)**Objectives:**

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS**Proteins :**

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism

13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream

infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis
- Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation

- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides, Antiarrhythmic drugs, Antianginal drugs, Antihypertensives and Diuretics, Haematinics, Erythropoietin, Drugs affecting coagulation, Fibrinolytic and Antiplatelet drugs, Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy, Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition
Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition
Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

| | |
|--|---|
| Needles | Intravenous Intrathecal Spinal Intra arterial Syringes: Tuberculin |
| Students Discussion Insulin I.V cannula Scalp. Vein set | |
| Students Discussion | Enema can Inhalers |
| Spacers Nebulizers | |
| Students Discussion Students Discussion | Tablets – Enteric coated, Sustained release, Sub-lingual Capsules, Spansules, Pessary, Suppository |

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter,

Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body- A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,

- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER III

| S.No | SUBJECTS |
|-------------|----------------------------|
| 1 | Histopathology – Theory |
| 2 | Histopathology – Practical |
| 3 | Cytology – Theory |
| 4 | Cytology – Practicals |
| 5 | Medical Ethics |
| 6 | Psychology |

SEMESTER-III

HISTOPATHOLOGY – THEORY

OBJECTIVE

1. To develop in depth knowledge on histopathological aspects in laboratory for diagnosis.
2. To develop exhaustive ideology of various techniques used in histopathology.

CONTENTS

UNIT – I

Introduction- Receipt and dispatch of biopsy material Documentation.

UNIT II

Fixation & Grossing, Tissue processing (Dehydration, clearing, impregnation, embedding) (Decalcification)

UNIT – III

Microtomy, Knives & Knife sharpening, Tissue sectioning, mounting etc.

UNIT – IV

Principles of staining, Staining techniques – Routine & special.

UNIT – V

Filling, indexing and preservation of blocks. Frozen section (cryostat), museum techniques.

Text Books:

1. Wheater's Basic Pathology: A Text, Atlas and Review of Histopathology, Young, 5th edition, Elsevier Health Sciences, 2009

Reference Books:

1. Histopathology Specimens: Clinical, Pathological and Laboratory Aspects, Derek C. Allen, Iain R.
2. Cameron, 2nd edition, Springer Science & Business Media, 2012.

HISTOPATHOLOGY

PRACTICAL (UE)

OBJECTIVE

1. To develop in depth knowledge on histopathological aspects in laboratory for diagnosis.
2. To develop exhaustive ideology of various techniques used in histopathology.

CONTENTS

PRACTICALS

1. Tissue sectioning and H & E staining
2. Special staining:
3. Perls stain
4. PAS stain
5. Giemsa stain
6. Ziehl – Neelsen stain
7. Reticulin stain
8. Van Gieson stain
9. Embedding
10. Frozen sectioning

SPOTTERS

1. Lab materials – Name & application of each:
2. Tissue cassette
3. Paraffin wax
4. Disposable blade for microtome
5. DPX
6. Waterbath
7. Diamond pencil
8. Cover slip
9. Formalin
10. Chloroform
11. Alcohol
12. Xylene

CHARTS/PHOTOGRAPHS

1. Histokinette
2. Microtome
3. Cryostat
4. Embedding station

CYTOLOGY THEORY (UE)

OBJECTIVES

1. To provide an introduction to concepts in cytology
2. To elaborate on preparation techniques of various stains and their importance in cytology.

CONTENTS

UNIT- I

Introduction to FNAC & Exfoliative cytology :Fixation of smears, Coating fixatives, Polyethylene glycol solution, Diaphane solution, Rehydration of air dried smears, Mailing of unstained smear, Preservation of fluid specimens prior to processing - Fresh material, Specimens with a high mucous content, Specimens with a high protein content, Specimens with a low mucous or protein content, Specimens with low PH ,Pre fixation of material, Ethyl alcohol (50% solution), Sacromannos fixative, Mucolox,Preparation of fluid smears for microscopic examination, Direct or sediment smears on glass slides (fresh / clotted / bloody / prefixed)

UNIT- II

Processing of fluids- Sputum, bronchial aspirates, bronchial washings, gastric washings, Urine & other watery fluids, Cerebrospinal fluid.

UNIT- III

Cytocentrifuge preparations - Shandon's cytopsin, Unloading the machine, Operation, Comments; Preparation with membrane filters, Materials needed, Specimen requirements, Method of filtration; Preparation of cell blocks, Fixed sediment method, Bacterial agar method Plasma thrombin clot method.

UNIT-IV

Preparations of stains and solutions used in the Papanicolau staining method - Graded alcohols, Bluing solutions, Preparation of Harris, Mayer, Lillie Mayer and Gill Haematoxylin, EA50, EA 36, EA 65 and Orange G; Stains for hematologic material and air dried smears, Wright stain, Giemsa stain, Wright Giemsa stain, Modified May Grunwald Giemsa stain.

UNIT – V

Important factors influencing staining results, Maintenance of solutions and stains, Dipping slides, Intensity of staining reaction, Contamination control, Important factors influencing the staining results of filters, Destaining slides, Timing, Dye solubility and impurities, Total dye content, Stains with special purpose depending on category, use

stain and fixative; Mounting the cell sample, Mounting medium, Dissolving nuclear pore filters prior to staining, Dissolving nuclear pore filters after staining, Cover slips, Cover slipping the entire sample, Method of cover slipping glass slides and filters, Cooling slides; Stains used in hormonal evaluation; Stains used in the identification of sex chromatin.

Text Books:

1. Medical Laboratory Technology : Methods and Interpretations Vol – 1, RAMNIK SOOD, 6th edition, Jaypee Brothers Medical Publishers, 2009

Reference Books:

1. A Textbook of Experimental Cytology, Gray, Cambridge University Press, 2013.

CYTOLOGY PRACTICAL

OBJECTIVES

1. To provide an introduction to concepts in cytology
2. To elaborate on preparation techniques of various stains and their importance in cytology.

CONTENTS

EXERCISE

1. Pap staining (1x10 = 15 marks)
2. Any one of the following: (1x10 = 15 marks)
3. Centrifuging fluid, making smear out of it and staining it with MGG (or) Leishman (or) Wright-Giemsa stain
4. Preparation of cytotech smear and staining it with MGG (or) Leishman (or) Wright-Giemsa stain

SPOTTERS

5. Lab materials – Name & application of each:
6. Cytotech cassette
7. Pasteur pipette
8. Koplin jar
9. Diamond pencil
10. Mention two applications of the following: (Any one) (1x2 = 2 marks)
11. 95% ethanol
12. Absolute methanol
13. Xylene

CHARTS

14. Pap smear - normal
15. Pap smear - malignancy

PSYCHOLOGY

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms,

frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

MEDICAL ETHICS

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

SEMESTER IV

| S.No | SUBJECT |
|-------------|--|
| 1 | Clinical Pathology(Hematology & Urine Analysis) -Theory |
| 2 | Clinical Pathology(Hematology & Urine Analysis) -Practical |
| 3 | Blood Banking & Immunology - Theory |
| 4 | Blood Banking & Immunology - Practical |
| 5 | Basics And Advanced Life Support |
| 6 | Medical Sociology |

SEMESTER IV

Clinical Pathology(Hematology & Urine Analysis) -Theory

OBJECTIVES

1. To develop in depth knowledge on pathological aspects in relation to hematology.
2. To develop exhaustive ideology of techniques involved in urine analysis.

CONTENTS

UNIT – I

Components of blood and their functions, Haematopoietic system of the body, Specimen collection for haematological studies, Discarding procedures, Cleaning of laboratory glassware in hematology, Determination of Hb concentration, Calculation of blood cell indices - MCV, MCH & MCHC, Estimation of erythrocyte sedimentation rate, Estimation of packed cell volume.

UNIT – II

Peripheral smear examination–staining, interpretation, normal & abnormal cells, parasites, Reticulocyte count, Counting on hemocytometer, Automated systems in hematology.

UNIT – III

Approach to the diagnosis of anemia, Screening for sickle cell anemia, Estimation of fetal Hb, Hemoglobin electrophoresis, Osmotic fragility test, Heinz body preparation, Lupus erythematosus (LE) cell preparation; Approach to the diagnosis of leukemias, Cytochemical tests and other investigations; Preparation of bone marrow smears for microscopic examination.

UNIT – IV

Haemostasis, Mechanism of blood coagulation, Fibrinolysis, Bleeding time determination, Whole blood clotting time, Thrombin time, Clot retraction and lysis time, Preparation of blood samples for coagulation test, PT, PTT, APTT, Plasma recalcification time, thrombin time, Lab diagnosis of bleeding disorders.

UNIT – V

Urine analysis with manual & strip methods, CSF analysis, Analysis of serous fluids, synovial fluids, gastric juice, Semen analysis

Text Books:

1. Hematology, Larry, Waterbury, 3rd sub edition, Lippincott Williams & Wilkins, 1988.

REFERENCE BOOKS

1. Dacie and Lewis Practical Haematology, Bain, 11th Edition, Elsevier Health Sciences, 2012.

CLINICAL PATHOLOGY HEMATOLOGY & URINE ANALYSIS PRACTICAL (UE)

OBJECTIVES

1. To inculcate thorough knowledge on life support skills.
2. To elaborate on various first aid techniques and triage

CONTENTS

EXERCISE:

1. Smearing peripheral blood, staining with Leishman stain and differential counting
2. Urine physical & chemical examination for the presence of reducing sugar, protein, blood, ketone – manual method
3. Urine physical & chemical examination for the presence of reducing sugar, protein, blood, ketone – strip method
4. Hb estimation by colorimeter
5. Estimation of ESR
6. Total count on hemocytometer
7. Staining of reticulocytes
8. Semiautomated PT
9. Semiautomated aPTT
10. Urine microscopic examination
11. Fluid – Physical examination, Total count
12. Fluid – Differential count on a stained smear

SPOTTERS:

1. Lab materials – Name & application of each:
2. Vacutainer - Lavender / Blue / Green / Grey topped
3. ESR tube
4. Cuvette
5. PCV tube
6. Pasteur pipette
7. Micropipette
8. RBC pipette
9. WBC pipette
10. Neubauer chamber
11. Bone marrow needle
12. Lancet

SLIDE IDENTIFICATION

13. Malaria
14. Iron deficiency anemia

15. Charts:
16. Microfilaria
17. Reticulocyte
18. Sick cell
19. Chronic myeloid leukemia
20. LE cell

BLOOD BANKING AND IMMUNOLOGY – THEORY (UE)

OBJECTIVE

1. To provide an introduction to Blood grouping, antibody screening, cross matching
2. To enable the students to understand the basic concepts in Immunology.

UNIT I

Immunology-

Introduction to immunology, Cells of Immune System, Complement pathway, Cytokines, Hypersensitivity reactions, HLA and Tissue typing, Blood group genetics, Elisa, Western blot .

UNIT II

Introduction to Immunohematology-

Introduction to immunohematology, Characteristics of antigens – antibodies, Factors influencing antigen – antibody reactions, Principles of antibody potentiators, Direct antiglobulin test, Indirect antiglobulin test, Sources of error in antiglobulin test, Blood banking reagents, Routine testing procedures in immunohematology laboratory, ABO blood group system, Rh blood group system, Other blood groups.

UNIT- III

Blood Banking Technology

Blood donor selection, Blood donor reactions, Blood collection, Blood component preparation and storage, Blood component uses, Pretransfusion testing, Blood administration, Adverse reactions of blood transfusion.

UNIT-IV

Transfusion Transmitted Diseases and safety precautions

Transfusion transmitted diseases, HIV, HBs Ag, HCV, Syphilis and Malaria, Testing for TTI, Universal precautions

UNIT-V

Quality Assurance and Regulation of Blood Bank Industry

1. Blood bank licensing issues, Good manufacturing practices, Blood bank safety programs

Text Books:

1. Basic & Applied Concepts of Immunohematology - Pageburst E-Book on VitalSource, Kathy D Blaney, Paula R Howard, Elsevier Health Sciences, 2008.

Reference Books:

1. Basic Clinical Laboratory Techniques, Barbara Estridge, Anna Reynolds, Cengage Learning, 2011.

BLOOD BANKING & IMMUNOLOGY – PRACTICAL (UE)

OBJECTIVES

1. To provide an introduction to Blood grouping, antibody screening, cross matching
2. To enable the students to understand the basic concepts in Immunology.

CONTENTS

EXERCISE:

1. Blood grouping & Rh typing
2. Cross matching
3. Direct Coombs test
4. Indirect Coombs test
5. TTI rapid tests
6. Antisera affinity & avidity

SPOTTERS:

7. Antisera
8. Gel cards
9. Pasteur pipette
10. Elisa plates
11. Antiglobulin reagents
12. TTI rapid test rate
13. Blood bags – single, double, triple
14. Fresh frozen plasma
15. Platelet concentrate
16. Leukodepletion filters

BASIC AND ADVANCED LIFE SUPPORT

- BLS
- TRIAGE
- Primary survey
- Secondary survey
- Airway & Ventilatory management
- Shock
- Central & peripheral venous access
- Thoracic trauma – Tension pneumothorax
- Other thoracic injuries
- Abdominal trauma – Blunt injuries
- Abdominal trauma – Penetrating injuries
- Spine and spinal cord trauma
- Head trauma
- Musculoskeletal trauma
- Electrical injuries
- Thermal burns
- Cold injury
- Pediatric trauma
- Trauma in pregnant women
- Workshop BLS
- Workshop cervical spine immobilization
- Imaging studies in trauma
- The universal algorithm for adult ECC
- Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
- Pulseless electrical activity (PEA) / asystole algorithm
- Bradycardia treatment algorithm
- Tachycardia Treatment algorithm
- Hypotension / Shock
- Acute myocardial infarction
- Pediatrics Advanced life support
- Defibrillation

- Drugs used in ACLS
- Emergency cardiac pacing
- AED

Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY

UNIT 1: NATURE AND SCOPE OF SOCIOLOGY

Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

UNIT 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

UNIT 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

UNIT 4: SOCIOLOGY OF INDIA

Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

UNIT 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist

Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system.

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.. C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications

SEMESTER V

| S.No | SUBJECT |
|-------------|--|
| 1 | GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMATIC BACTERIOLOGY - THEORY |
| 2 | GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMATIC BACTERIOLOGY - PRACTICAL |
| 3 | VIROLOGY , MYCOLOGY AND PARASITOLOGY -THEORY |
| 4 | VIROLOGY , MYCOLOGY AND PARASITOLOGY - PRACTICAL |
| 5 | ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE |

SEMESTER V
GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMATIC
BACTERIOLOGY – THEORY (UE)

OBJECTIVES

1. To develop in depth knowledge on Bacteriology.
2. To develop exhaustive ideology of immunology and its importance in diagnosis.

CONTENTS

UNIT- I

General bacteriology

Morphological classification of bacteria, Bacterial cell structure- cell wall, cytoplasmic membrane, cytoplasm, flagella, fimbriae, nucleic acids, capsule, spore (diagram of bacterial cell structure), Definition of sterilization and disinfection, classification of physical and chemical methods of sterilization, autoclave, hot air oven, filtration, chemical agents of sterilization- alcohol, aldehydes, halogens, phenol, gaseous method of sterilization, surface active agents, quality controls for sterilization procedures.

UNIT- II

Culture media & methods

Culture Media –Types –simple media, enriched media, enrichment media, selective media, indicator media, sugar media, transport media, anaerobic media (suitable examples); Culture methods-Aerobic culture method- streak culture, lawn culture, stroke culture, stab culture, inoculation in liquid culture, Anaerobic culture media and methods Robertson's cooked meat media, thioglycollate medium, Anaerobic jar; Identification of bacteria- staining techniques – grams staining, acid fast staining. Biochemical reactions - sugar fermentation and IMViC tests; Antibiotic susceptibility testing- Kirby Bauer disc diffusion test.

UNIT- III

Immunology

Sources and spread of infections, Immunity – definition, types of immunity with examples, vaccines, antibodies- types and functions, Antigen antibody reactions- precipitation, agglutination, ELISA, immunochromatography, Hypersensitivity- definition, types, anaphylaxis.

UNIT- IV

Systemic Bacteriology

Staphylococcus, Streptococcus, – morphology, culture characteristics, Laboratory diagnosis; Niesseria-Gonococcus and meningococcus- morphology, culture characteristics, Gram negative bacilli – Escherichia coli, Klebsiella species, Proteus species, Pseudomonas species, Salmonella species, Shigella species, Vibrio species, Acinetobacter species – Morphology, cultural characteristics, laboratory diagnosis.

UNIT- V

Mycobacterium tuberculosis-

Morphology, culture characteristics & Laboratory diagnosis, Hospital acquired infections- definition, types, source and mode of spread of infection, hospital infection control, Biomedical waste management- definition, segregation, management, Universal precautions.

Text Books:

1. Laboratory Directions For Beginners In Bacteriology, Veranus A. Moore, Adlard Coles Nautical Books, 2007.

Reference Books:

1. Lippincott's illustrated reviews immunology, Doan T., 2nd edition, LWW, 2012.

GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMATIC BACTERIOLOGY – PRACTICAL (UE)

OBJECTIVE

1. To develop in depth knowledge on Bacteriology.
2. To develop exhaustive ideology of immunology and its importance in diagnosis.

CONTENTS

General Bacteriology

1. Microscope- Structure, operation, maintenance
2. Staining techniques- simple staining, Gram staining, Acid fast staining
3. Detection of motility by hanging drop.
4. **Sterilization** – Autoclave -Principle, working, maintenance
Hot air oven -Principle, working, maintenance
5. Chemical disinfectants –sodium hypochlorite, lysoformin, phenols, gluteraldehyde- uses.

Culture Media & Culture methods

1. Culture Media –Types –simple media, enriched media, enrichment media, selective media, indicator media, sugar media, transport media, anaerobic media –Preparation, sterilization and uses
2. Culture methods-Aerobic and anaerobic culture methods - Techniques
3. Identification of bacteria- biochemical reactions preparation and inoculation and interpretation
4. Antibiotic susceptibility testing- Kirby Bauer disc diffusion test

Immunology

1. Serological tests- agglutination tests – Latex agglutination, tube agglutination.
2. Immunochromatography - Rapid card tests .
3. ELISA (Enzyme linked immunosorbent assay)

Systemic Bacteriology

1. Staphylococcus, Streptococcus– Microscopy, colony morphology, identification
2. Niesseria-Gonococcus and meningococcus- Microscopy
3. Gram negative bacilli – Escherichia coli, Klebsiella species, Proteus species, Pseudomonas species, Salmonella species ,Shigella species, Vibrio species – Microscopy, colony morphology, identification
4. Mycobacterium tuberculosis- Microscopy, colony morphology, identification

Applied Microbiology

1. Hospital acquired infections- definition, types ,source and mode of spread of infection, hospital infection control- charts
2. Biomedical waste management- spotters & charts
3. Universal precautions- spotters & charts.

VIROLOGY, MYCOLOGY AND PARASITOLOGY – THEORY (UE)

OBJECTIVE

1. To inculcate knowledge on virology in detail.
2. To elaborate on mycology and parasitology.

CONTENTS

UNIT- I

General virology:

General properties of viruses –Basic structure of the virus, classification of viruses, viral multiplication, Cultivation of viruses- Animal inoculation, embryonated eggs, tissue cultures, Laboratory diagnosis of viral infections- Briefly on Microscopy, detection of viral antigens and antibodies, isolation of virus, molecular diagnosis, Viral vaccines- Live and killed viral vaccine routinely administered.

UNIT- II

Medically important viruses I

Mode of transmission, clinical manifestations, and preventive measures - Herpes simplex viruses (HSV I&II), Influenza virus, Polio virus, Measles.

UNIT- III

Medically important viruses II

Mode of transmission, clinical manifestations, and preventive measures, Dengue, Japanese B encephalitis, Chikungunya, Hepatitis, HIV

UNIT- IV

Medically important fungi

Morphology & infections caused by -Candida species, Dermatophytes, Aspergillus species, Mucor & Rhizopus, Culture media and staining methods used in identification of fungi.

UNIT- V

Medically important parasites

Etiology, mode of transmission, sample to be collected - Ameobiasis, malaria ,tape worms, round worm hook worm and filarial worm infections, Stool examination, Peripheral blood smear examination.

Text Books:

1. Textbook of Virology, Vinod Singh, 1st edition, Ibdc Publishers, 2010.

2. Textbook of Mycology, Sandeep Saxena, 1st edition, Sonali Publications, 2012.

Reference Books:

1. Clinical Parasitology : A Practical Approach, Zeibig, 2nd edition, Elsevier Health Sciences, 2012.

VIROLOGY, MYCOLOGY AND PARASITOLOGY – PRACTICAL (UE)

OBJECTIVE

1. To inculcate knowledge on virology in detail.
2. To elaborate on mycology and parasitology.

CONTENTS

PRACTICALS/DEMONSTRATORS

1. Sample collection –blood collection , serum separation, collection of other required specimens
2. Rapid card tests & ELISA for detection of antigens and antibodies.
3. Fungal media preparation and inoculation –Sabouraud's Dextrose Agar, Corn meal agar.
4. Staining techniques- LPCB mount ,KOH mount
5. Stool concentration techniques, identification of ova cyst in stool samples by saline and iodine mount,
6. Peripheral blood smear -Preparation, Leishman's staining.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

Natural Resources: Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging, and salinity, Energy Resources.

Ecosystems: Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

Pollution: Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

Social Issues Human, Population and Environment: From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

Concept of health & disease: Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation – Natural history of disease – Iceberg phenomenon-concept of control- concept of prevention-Modes of Intervention, Changing pattern of disease.

Epidemiology: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

Environmental & health: Definition & Components (environment sanitation environmental sanitation) Water : Safe & Wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1). Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

Air pollution & its effects. Prevention & Control of air pollution

Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation,

SEMESTER VI

| S.No | SUBJECT |
|-------------|-------------------------------------|
| 1 | CLINICAL CHEMISTRY – I - THEORY |
| 2 | CLINICAL CHEMISTRY – I - PRACTICAL |
| 3 | CLINICAL CHEMISTRY – II - THEORY |
| 4 | CLINICAL CHEMISTRY – II - PRACTICAL |
| 5 | HEALTHCARE AND BASIC PRINCIPLES |

SEMESTER VI

CLINICAL CHEMISTRY - THEORY (UE)

OBJECTIVE

1. To inculcate knowledge on various chemical aspects involved in laboratory diagnosis.
2. To elaborate on various instrumentation and procedures in clinical chemistry for laboratory diagnosis.

CONTENTS

UNIT- I

Role of a lab technician in Clinical Biochemistry lab

Lab utensils: Beaker, Funnels, graduated cylinders, Flasks, Volumetric flasks, Syringes, Pipettes, Micro pipettes, Multi-Channel pipettes, Dilutors & Dispensers. Quality control of micropipettes, Quality control validation for performance of pipettes; Lab plastic & Glass ware composition and cleaning; Laboratory safety: Guidelines of OSHA, General safety (Fire, Electrical safety), Chemical Hygiene plan, Storage of chemicals, Labelling & Handling requirements, Waste generation & disposal.

UNIT- II

Units of measurement

Measurement of mass - basic quantities and units of SI. SI derived units used in medicine. Types of balances - maintenance of balance; Basic calculations in Laboratory. Normality, Molality, Molarity, Dilutions - per cent concentration (wt/w, v/v, w/v), pH, pK, buffer preparation; Water as Reagent - Reagent grade water - purification process - Grade of water purity - storage & handling of reagent water - suggested uses of reagent water - Quality control - system documentation & record keeping.

UNIT-III

Instrumentation

Centrifuges - principles of centrifugation - centrifuge types, components, maintenance and quality assurance Water bath, Oven, Incubator -thermometer, calibration and maintenance, Photometry - principles of photometry. Components & applications of colorimeter. Spectrophotometer, Flame photometer, Nephelometer, turbidimetry & reflectance photometry, Enzymes definition, action, and kinetics.

UNIT-IV

Electrochemistry: Principles and measurements of electrochemistry & electro analytical chemistry. Potentiometry, Voltammetry, coulometry methods - Principles, components, usage, advantages & disorders; Electrophoresis - Principles, components, procedure, types, clinical application & interpretation of the data

UNIT- V

Chromatography - Principles, components, procedure, types, clinical application; Immunochemistry techniques - Principles of immunochemistry, detectors needed sensitivity & specificity- Elisa, Chemiluminescence, fluorescence assays; Semi-automatic, Automatic - Overview , Principles and methodologies used.

Text Books:

1. Textbook Of Biochemistry, Sree Kumari Vasudevan, 5th edition, Jaypee Brothers Medical Publishers (p) Ltd, 2007.

Reference Books:

1. Principles of Biochemistry, Voet D 4th edition, John Wiley & Sons Inc. 2012

SEMESTER- VI

CLINICAL CHEMISTRY – PRACTICAL (UE)

OBJECTIVE

1. To inculcate knowledge on various chemical aspects involved in laboratory diagnosis.
2. To elaborate on various instrumentation and procedures in clinical chemistry for laboratory diagnosis.

CONTENTS

PRACTICALS/DEMONSTRATIONS

1. Pipetting & Weights and Measurements: Principles of weighing, usage of pipettes, pipetting
2. practice - principles of weight - preparation of solutions, Normality -- molality - molarity - Dilution -
3. Percentage (V/V, W/V, V/W)
4. pH and Buffers -Preparation of different buffers - measurements of pH (pH paper, pH meter)
5. Standardisation of Biochemical substances - Glucose, Urea, Creatinine
6. Estimation of Glucose, Urea, Creatinine, total protein, Albumin

Charts / Spotters /Case Studies

- 1) Lab safety
- 2) Grading of reagent water
- 3) Conversion of Units
- 4) Calculation in Biochemistry
- 5) Waste generation St Disposal
- 6) pH
- 7) Buffer
- 8) Standardisation curve
- 9) Serum Protein Electrophoresis
- 10)instrumentation - Identification

SEMESTER VI

CLINICAL CHEMISTRY - THEORY (UE)

OBJECTIVE

1. To inculcate knowledge on various chemical aspects involved in laboratory diagnosis.
2. To elaborate on various instrumentation and procedures in clinical chemistry for laboratory diagnosis.

CONTENTS

UNIT- I

Pre – Analytical-

Blood Collection -Types of blood sample - Preservatives & anti-coagulants - Errors related to it Vacutainer system procedures to decrease phlebotomy related

variables - Patient identification sample collection - Past collection cause - sample transportation - Procedure to minimize sample transportation errors - use of mechanical transporters - sample processing - procedures - Pre analytical variables in urine collections - pre-analytical variables in other body fluids- Blood collection for inborn errors of Metabolism - Criteria for rejection of specimens

UNIT- II

Analytical-

Overview of glucose homeostasis, Definition of Diabetes, overview of pathophysiology, Type I, II, GDM, Pre-Diabetes. Methodologies, comparison of methodologies, reference level. Diagnostic guidelines - Glucose, Insulin, C-Peptide, Glucose Tolerance test Determination, usage of HbA1C methodology to estimate; Lipid Profile: Definition of lipid, Over view of types of lipid, distribution, their role in the L6L' - Estimation of Total Cholesterol, Triglycerides, HDL Cholesterol, LDL Cholesterol, VLDL Cholesterol - Methodology - Reference level - Diagnostic guidelines; Liver Profile - Overview of Liver damage and the tests to identify it - total protein, Albumin, Bilirubin (Total & Direct), ALT, AST, ALP & GGT - Methodology - Reference level; Renal Profile - Overview about Renal function, GFR, tubular function tests; Minerals: Role of minerals in health- estimation of calcium, phosphorus, Magnesium, Iron, copper - Methodology - Reference level - interpretation of data; Vitamins: Estimation of Folic acid , Vitamin B12, Vitamin D, Vitamin K, Vitamin B, b6 -methodology - Reference level - interpretation of data

UNIT- III

Special investigations: Hormones

Thyroid Gland Regulation, Test to Identify Thyroid disorder(T3, T4, FT3, FT4, TSH), Methodology and interpretation, Role of PTH in our Body, Tests to identify parathyroid disorder, PTH(free and Intact) Interpretation, Tests for Infertility LH, FSH, Prolactin, Estradiol, Testosterone(Free & total), B HCG interpretation, Methodologies existing, Hormone analysis

UNIT-IV

Other Special Investigations

Tumour markers - Investigation for Myocardial Infraction - Investigation for acute Pancreatitis- Acid - base abnormality - Anion Gap, Nutritional assessment - Negative Nitrogen Balance - Positive Nitrogen Balance

UNIT-V

Quality Control:

Sensitivity - Specificity - Linearity - Accuracy & Precision , Primary Standard, Secondary standard, Calibration - Internal Quality control indicators, External Quality control Program, test utilization and turn around time, around time , Regulations for Lab (by Indian Govt Internatio: Guidelines). Hospital

management structure - organisation of clinical lab, Communication within the total hospital, communication within the lab, Personal Management, Work Scheduling, Continuous Quality improvement - Continuing education - Resource management (Lab staff, reagents, supplies & capital equipment).

Text Books:

1. Textbook Of Biochemistry, Sree Kumari Vasudevan, 5th edition, Jaypee Brothers Medical Publishers (p) Ltd, 2007.

Reference Books:

1. Principles of Biochemistry, Voet D 4th edition, John Wiley & Sons Inc. 2012.

SEMESTER- VI

CLINICAL CHEMISTRY – PRACTICAL (UE)

OBJECTIVE

1. To inculcate knowledge on various chemical aspects involved in laboratory diagnosis.
2. To elaborate on various instrumentation and procedures in clinical chemistry for laboratory diagnosis.

CONTENTS

PRACTICALS/DEMONSTRATIONS

1. Estimation of Bilirubin, Cholesterol, Triglycerides, Uric Acid, Calcium, Phosphorus
2. Estimation of Enzymes amylase, Alkaline Phosphatase, Lipase
3. Electrophoresis - Agar gel Electrophoresis - serum Protein Electrophoresis Identification and interpretation
4. Chromatography - Circular paper chromatography - separation of Aminoacids & Sugars and calculation of Rf values

CHARTS / SPOTTERS /CASE STUDIES

1. Preservatives
2. Anti-coagulants

3. Types of Samples
4. Vacutainers
5. Blood Collection
6. Reference interval
7. Glucose Tolerance test graphs
8. Interpretation of Routine tests
9. QC materials
10. Guideline for regulation of Lab

HEALTH CARE MANAGEMENT

1. Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

2. Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

3. Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

7. Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

8. Health Insurance

SEMESTER VII

| S.No | SUBJECT |
|-------------|-------------------------------------|
| 1 | PROJECT AND DISSERTATION |
| 2 | STATISTICS AND RESEARCH METHODOLOGY |

SEMESTER-VII
BIO-MEDICAL STATISTICS AND RESEARCH METHODOLOGY

1. What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences.
2. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
3. Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
4. Cumulative frequency curve – Ogives – Drawing inference from graph.
5. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
6. Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
7. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.
8. Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
9. Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
10. Tests of significance- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -6 months



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B.Sc. OPTOMETRY

Regulations, Curriculum and Syllabus
2017



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry, Biology
- ii) Physics, Chemistry, Botany and Zoology

b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks

DURATION -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

| | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- 40% minimum in the University End-Semester Theory examination
- 40% minimum in the University End-Semester Practical examination
- 40% of marks in the subject where internal evaluation alone is conducted
- 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.

- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19.Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.

- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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(Declared u/s.3 of the UGC Act, 1956)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (OPTOMETRY)

TOTAL HOURS : 420

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Ocular Anatomy and Ocular Physiology-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Ocular Anatomy and Ocular Physiology-Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Physical Optics and Geometrical Optics-Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Physical Optics and Geometrical Optics -Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Medical Ethics and Bio safety(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Psychology(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (OPTOMETRY)

TOTAL HOURS : 420

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---------------------------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Geometrical Optics II -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Geometrical Optics II -Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Principles of Lighting -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Optometric instruments-Theory (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Basics and advanced life support (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Sociology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (OPTOMETRY)

TOTAL HOURS : 390

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Ocular Diseases - I Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Ocular diseases-II Theory (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Visual Optics -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Visual Optics -Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Environmental science and Community medicine – Theory(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (OPTOMETRY)

TOTAL HOURS: 390

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Optometric optics-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Orthoptics and Dispensing Optics-Theory(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Low vision aids & contact lens-Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Low vision aids & contact lens -Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Healthcare and basic principles (IE) | 30 hours | - | | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|--|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| | | | | | | | | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Bio-Statistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi
- c. Biceps
- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye ballSS

6. Viva Voce

- a. Radiology – Xrays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure,classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic.Blood and body fluids

- Body fluid volumes,compartments,and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II. Estimation of Hemoglobin

III. RBC

IV. WBC

V. Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules-carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D

- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation

- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**
 - Spotter
- **GROSS (SPOTTER)**
 - Fatty liver
 - Lipoma
 - Dry gangrene foot
 - Wet gangrene bowel
 - CVC Spleen
 - Hydatid cyst

- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahlihemocytometer
- Neubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|----------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |

| | |
|----|-------------------|
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.

- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

• Endocrine System

- Pituitary gland
- Pineal body

- Thyroid & parathyroid gland
 - Adrenal
 - Pancreas
 - Gonads – Ovary & Testis
- **Cardio-Vascular System**
 - Heart
- **Lymphatic system**
 - Spleen
- **Respiratory System**
 - Lungs
 - Larynx
 - Trachea
- **Digestive System**
 - Salivary glands
 - Esophagus
 - Pharynx
 - Stomach
 - Liver, Gall bladder
 - Duodenum
 - Small intestine
 - Large intestine
- **Urinary system**
 - Kidneys
 - Ureter
 - Urinary bladder
- **Reproductive System**
 - Saggital section – Male & Female pelvis
 - Uterus & ligaments
 - Ovary
 - Prostate
 - Seminal vesicals
 - Vas deferens
 - Testis

- **Viva Voce**
 - Radiology – Xrays
 - Osteology
 - Charts
 - Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.

- Lung volumes and capacities-definition,normal values,intrapulmonary and intra pleural pressures,surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis,Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS**Proteins :**

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS**Nucleic acids:**

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN**Haemoglobin:**

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine
- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg

12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess

- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis
- Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC

- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in

mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application -Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,

- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions

7. C program- functions

8. C program – file handling

9. C program demonstrating the usage of user defined variables

10. Databases

11. Applications in Optometry

SEMESTER-III

| S.NO | SUBJECT |
|-------------|--|
| 1. | Ocular Anatomy and Ocular Physiology-Theory(UE) |
| 2. | Ocular Anatomy and Ocular Physiology-Practical(UE) |
| 3. | Physical Optics and Geometrical Optics-Theory (UE) |
| 4. | Physical Optics and Geometrical Optics -Practical (UE) |
| 5. | Medical Ethics and Bio safety(IE) |
| 6. | Psychology(IE) |

SEMESTER III

OCULAR ANATOMY AND OCULAR PHYSIOLOGY THEORY (UE)

OBJECTIVE:

- This subject gives an insight of the parts of the human body their structure and function in detail.
- Organs of the body will be studied to understand their structure, location in the body, their function and how they interact with other parts of the body.
- To develop in depth knowledge on anatomy of eye and structures in relation to Ocular system.
- To develop exhaustive knowledge of various physiological processes in relation to Ocular system.

OCULAR ANATOMY

UNIT-I

- Surface anatomy of the orbit – Nerve supply & blood supply of Extra-ocular muscles-Neural basis of eye movements – 3rd, 4th, 5th and 6th Cranial nerves – Anatomy of papillary pathway

UNIT-II

EYE:

- Sclera - Anatomy, Anterior & Posterior scleral foramen, Emisaria
- Cornea – Structure, transparency, nerves, Limbal transition zone
- Iris – Structure, Sphincter pupillae, Dilator Pupillae, blood vessels movement of fluid across iris
- Ciliary body – Pars plana, pars plicata, blood supply & Nerve supply, Blood supply, accommodation, presbyopia, Aqueous secretion
- Retina – anatomy, photoreceptors, general architecture

UNIT-III

Refractive media:

- Anterior chamber relation, Anterior chamber outflow apparatus, Lens structure, Vitreous gross & microscopic anatomy

UNIT-IV

Eyelids:

- Orbicularis oculi & levator palpebrae superioris, Anatomy, blood supply, nerve supply

UNIT-V

Adnexa:

- Lacrimal apparatus, Embryology and development of eye

Reference Books:

1. Inderbir Singh (I.B.S): A Text book of Human Neuro-Anatomy, Vikas Publishing House, 1985
2. A.K.Dutta: Essentials of Human Anatomy, Current books International Calcutta, Bombay, Chennai, 1989
3. Richard S Snell & M A Lemp, Ocular Anatomy of the eye, 1998

OCULAR PHYSIOLOGY

UNIT -I

- Eye lid
 - Movements and pathways
- Lacrimal Apparatus
 - Tear film & composition of tears
 - Tests to assess lacrimal excretory function
- Extra-ocular muscles
 - Articulation of eyeball in socket
 - Mechanics of movement
 - Control of eye movements
 - Diplopia-Diagnosis & assessment
 - Qualification of extraocular muscle
 - Limitation (measurement of torsion, measurement of deviation, measurement of field of BSV, measurement of field of muscle action)

UNIT –II

- Cornea
 - Biochemistry, Corneal Transparency, Innervation
- Aqueous Humor & Vitreous: Aqueous secretion & dynamics
 - Maintenance of IOP, Diurnal variations
 - Measurement of IOP
- Crystalline lens & Accommodation:
 - Biochemistry, glucose metabolism
 - Changes in lens structure
 - Depth of field & depth of focus

- Accommodation (Changes, Amplitude, accommodation & refraction, accommodation & convergence)
- Presbyopia

UNIT –III

- Iris & pupil
 - Pupillary reaction to light
 - Measurement of afferent papillary defect
 - Pharmacology of pupil
 - Horner's syndrome & evaluation
 - Analyzing anisocoria

UNIT –IV

- Retina
 - Photochemistry of Retina
 - Wald's visual cycle
 - Entopic phenomenon
- Acuity of vision
 - Vernier acuity, minimum angle of resolution, Principle of measurement, factors affecting visual acuity

UNIT –V

- Visual pathway
 - Optic nerve, chiasma& optic tract
 - Visual deprivation, lesions of pathway
- Visual Perception
 - Binocular vision, development, theories of fusion, Stereoscopic acuity, tests for stereopsis, anomalies of stereopsis, Dark adaption
- Colour Vision
 - Theories of colour vision
 - Defective colour vision
 - Testing for congenital & acquired colour vision defects
- Electrophysiology
 - Electro retinogram, Electro oculogram

REFERENCE BOOKS:

1. Davson H: Physiology of the eye, 4th edition., 1980
2. Sir Steward Duke Elders, System of Ophthalmology, Vol.4

OCULAR ANATOMY AND OCULAR PHYSIOLOGY-PRACTICAL(UE)

OCULAR ANATOMY

1. **Orbit:** Orbital structure demonstration
2. **Eye:** Cadaveric enucleation of eye

OCULAR PHYSIOLOGY

EYE AND VISION

1. Lid movements
2. Tests for lacrimal secretion
3. BUT
4. Extraocular movements, anterior segment examination – Slit lamp examination
5. Pupillary reflexes
6. Digital tonometry
7. Schiotz tonometry
8. Measurement of accommodation
9. Visual acuity measurement
10. Ophthalmoscopy and retinoscopy
11. Light and dark adaptation
12. Binocular vision
13. Colour vision

PHYSICAL OPTICS AND GEOMETRICAL OPTICS I-THEORY (UE)

Objectives:

- This subject requires the student to learn the different forms of lenses, manufacturing techniques, surface properties, other parameters and overall quality of lens from manufacturing unit to dispensing counter.

PHYSICAL OPTICS

UNIT -1 Light

- Nature of Light-Newton's Corpuscular Theory-Huygens's wave Theory-Maxwell's electromagnetic Theory-Einstein's quantum Theory-Dual Nature theory
- Properties of light - Spectrum of light
- Visible light and the eye- Fechner's Law-Weber's law
Measurement of Light-Radiometry-Photometry

UNIT -2 Interference

- Interference phenomena in Optics-Constructive Interference-Destructive interference
Coherence-Spatial Coherence-Temporal coherence
- Applications of interference Thomas Young's experiment
- Interference in thin films -Lloyd's single mirror-interference due to reflected and transmitted light
- Wedge shaped thin films- testing of planeness of surface
- Newton's rings experiment-refractive index of liquid
- Non-reflecting films
- Interferometer-Michelson interferometer-Fabry-Perot interferometer

UNIT-3 Diffraction

- Phenomenon of Rectilinear Propagation
- Fresnel's diffraction
- Fraunhofer diffraction
- Applied aspects of diffraction
- Single slit, qualitative and quantitative
Zone plate
- Circular aperture

UNIT-4 Polarization

- Polarization of transverse waves-light as transverse waves
- Double refraction
- Nicol prism - Nicol prism as an analyzer
- Elliptically & Circularly polarized light

- Optical activity- Fresnel's experiment
- Biquartz
- Applications of polarized light

UNIT-5 Spectrum

- Sources of spectrum: Bunsen-carbon-mercury-sodium
- Emission and absorption spectra
- Classification of emission spectra
- Solar spectrum
- Ultraviolet Spectrum Infrared spectrum
- Electromagnetic spectrum

UNIT-6 Scattering

- Applied Aspects-Glare effect-light reduction effect
- Photo electric effect
- Raman Effect
- LASER

UNIT-7 Optical instruments

- Spectrometer
- Simple and compound microscope
- Telescope
- Resolving power of optical instruments
- Resolving power of the eye
- Magnifying power of simple and compound microscope, telescope

REFERENCE BOOKS:

1. Optics-Hecht (International Edition 4)
2. The principles of Physical optics-Ernst mach
3. Physical optics-S.A. Akhmanov&S.Yu.Nikitin
4. Radiation & Optics – Stone Mc.Graw Hill
5. The eye & visual optical Instruments-George Smith & David Atchison
6. Fundamentals of Optics-Jenkins & White, McGraw Hill
7. Principles of Optics-Born & wolf

GEOMETRICAL OPTICS-I

- **Stimulus of vision**
 - Laws of reflection and refraction
 - Total internal reflection
 - The Ray model
 - Fermat's principle

- **Refraction through spherical surfaces**
 - Introduction: Lenses-Spherical lens-Cylindrical lens-Contact lens -Divergence and convergence of wave fronts by spherical surfaces - Definition of diopter -Vergence
 - Working of spherical lenses – primary and secondary focal points
 - Prism diopter: Prentice’s law – deviations
 - Refraction at single Spherical or plane surfaces: convex – concave — Nodal points & nodal ray-lateral magnification and angular magnification-Snell’s law of refraction
 - Thin lenses: lenses in contact-lenses separated by a distance.
 - Thick lenses — cardinal points - front and back vertex powers reduced system
 - Cylindrical and spherocylindrical lenses: location of foci-image planes-principle meridians-refraction by a cylindrical lens -calculation of power in different meridians - spherocylindrical lenses- circle of least confusion- refraction through a spherocylindrical lens- writing Rx in different forms (+cyl., -cyl., meridional)- additional sphero-cylinders- oblique-cylinders.
- **Stops, Pupils and Ports**
 - Entrance pupil & exit pupil (size & location)
 - Field stop
 - Entrance port & exit port, field of view, vignetting
 - Depth of field and depth of focus
- **Aberrations:**
 - Spherical
 - Coma
 - Oblique astigmatism
 - Curvature of field
 - Distortion
- **Thin prisms and Mirrors**
 - Unit of measurement (prism diopter)
Prism deviation in prism
Combination of thin prisms
 - Dispersive power of prism-achromatic prisms
Planar & spherical reflection in mirrors
Magnification in mirrors
 - Lens/mirror systems

REFERENCE BOOKS:

1. Mirrors, Prisms & Lenses-southall, Dover
2. Geometric, Physical & Visual Optics-Michael P.Kealing
3. Aberrations of Optical systems-W.T.Welford
4. Introduction to Geometrical optics-Milton Katz
5. N.Subramanyam&BrijLal: A text book of Optics, S.Chand& Co.

PHYSICAL OPTICS AND GEOMETRICAL OPTICS I-PRACTICALS (UE)

PHYSICAL OPTICS

Practicals:

1. Newton's Ring's-radius of curvature-refractive index of lens
2. Newton's Ring's-refractive index of a liquid
3. Air wedge-thickness of a wire (hair)
4. Grating-wavelength determination
5. Dispersive power of a grating
6. Grating – minimum deviation & Wavelength determination
7. Reflection grating
8. Diffraction at a straight wire
9. Resolving power of a telescope
10. Polarimeter
11. Fresnel's biprism experiment
12. Thickness of thin glass plate

GEOMETRICAL OPTICS -I

Practicals:

1. Refraction through a slab
2. Caustic curve for a glass slab
3. Refraction at a curved surface
4. I-d curve for a prism – pin method
5. Spherometer and lens gauge
6. Single optic lever
7. Double optic lever
8. Spherical mirrors
9. Spherical lenses
10. Critical angle – glass and water
11. magnifying power of a simple and a compound microscope
12. Magnifying power of a telescope

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tamparo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning.Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality.Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship.Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

SEMESTER-IV

| S.NO | SUBJECT |
|-------------|---------------------------------------|
| 1. | Geometrical Optics II -Theory (UE) |
| 2. | Geometrical Optics II -Practical (UE) |
| 3. | Principles of Lighting -Theory (UE) |
| 4. | Optometric instruments-Theory (UE) |
| 5. | Basics and advanced life support (IE) |
| 6. | Sociology (IE) |

SEMESTER - IV
GEOMETRICAL OPTICS II -THEORY (UE)

UNIT-I

INTRODUCTION:

- Vergence and vergence techniques revised. Lens power, prism power, cylindrical lenses
- Gull strand's schematic eyes, visual acuity, Stile Crawford experiment

UNIT-II

ERRORS OF REFRACTION:

- Emmetropia and ametropia
- Correction of ametropia with lenses
- Myopia
- Hypermetropia
- Astigmatism-Causes of Astigmatism-Types of Astigmatism-Application-for eg., to calculate dioptric power - angular magnification of spectacles in aphakic-presbyopic patients
- Aphakia
- Presbyopia

UNIT-III

- Thin lens model of the eye
- Angular magnification
- Magnification of microscope, telescope
- Spectacle and relative spectacle magnification.
- Applications – To calculate the angular magnification, dioptric power of spectacles, spectacle magnification, entrance and exit pupils, vertex distances

UNIT-V

LASER OPTICS:

- Laser optics – basic laser principles – spontaneous and stimulated emission.
- Coherence – spatial, temporal, laser pumping- population inversion optical feedback
- Gas lasers, solid lasers, helium-neon laser- Argon-ion laser-ruby laser
- Monocular laser-carbon dioxide, excimer laser - Semiconductor lasers.
- Lasers in medicine ophthalmic applications

REFERENCE BOOKS:

1. Lasers –Milonni&Eberly, John wiley& sons
2. N.Subramanyam&BrijLal: A text book of Optics, S.Chand& Co

GEOMETRIC OPTICS II –PRACTICAL(UE)

1. Spectrometer – minimum deviation
2. Spectrometer – I-d curve
3. Spectrometer – I-I' curve
4. Spectrometer – narrow angled prism
5. Refractive index by microscope
6. Focimeter
7. Dispersive power of a prism
8. Toric lens and meniscus lens
9. Nodal slide
10. Boy's method – radius of curvature
11. Liquid lens
12. Refractive index of lenses
13. Powers of concave and convex mirrors

PRINCIPLES OF LIGHTING-THEORY (UE)

- **Unit-I Modern theory on light and colour:**
 - synthesis of light
- **Unit-II Colour theory:**
 - Additive and subtractive synthesis of colour
 - Goethe's theory & reasoning – colour temperature-colour rendering
- **Unit- III Visual task:**
 - factors affecting visual tasks
- **Unit-IV Light and vision:**
 - Discomfort glare
 - Visual ability
 - relationship among lighting
 - visibility and task performance
- **Unit-V Light sources:**
 - Sunlight
 - Modern light sources
 - spectral energy distribution
 - luminous efficiency
 - colour temperature
 - colour rendering.
- **Unit-VI Illumination:**
 - Luminous flux
 - Candela
 - solid angle
 - illumination, utilization factor, depreciation factor, Illumination laws
- **Unit-VII Lighting System Design:**
 - Design approach
 - Design process
 - concept of lighting design
 - Physical consideration and psychological consideration and types of lighting

- **Unit-VIII Photometry:**
 - Photometric quantities - photometers and filters
- **Unit-IX Fibre optics:**
 - Optical description
 - optical fiber communication
 - optical fibre cables.

REFERENCE BOOKS:

1. Color: An introduction to practice and principles
2. Applied Illumination Engineering-Lindsey
3. Illuminating Engineering Society of North America Introductory Lighting, 1985

OPTOMETRIC INSTRUMENTS-(THEORY)(UE)

UNIT-I

- Binocular vision
- Simple and compound microscope – oil immersion eyepiece
- Test charts and choice of charts
- Trial case lenses – best forms
- Refractor (phoropter) head units –Auto refractors
- Trial frame design
- Retinoscope – types available

UNIT-II

- Special Instruments:
 - Brightness acuity test, Vision analyzer, Pupilometer
 - Video acuity test, Nerve fiber analyzer.
- Ophthalmoscopes and related device
- Lensometer, lens gauge or clock
- Pupilometer
- Video acuity chart

UNIT-III

- Slit lamp
- Tonometry
- Fundus camera: The fundus camera - principle The fundus camera – technique
- External eye photography – apparatus
- Keratometer and corneal topography
- Refractionometer
- Orthoptic Instruments:
 - Haploscopes
 - home devices
 - pleoptics
- Colour vision testing devices:
 - Colour confusion
 - Hue discrimination
 - Colour matching
 - FM-100 hue test

UNIT-IV

- **Fields of vision and screening devices:**
 - Perimeter and the visual field

- Screeners :Goldmann and Humphery
- Goldmann and humperyVision Analyzer
- **Optical devices and electronic (Low vision) aids**
- **Ophthalmic Ultrasonography:**
 - Biometry/Ultrasound/'A' Scan/'B' Scan/UBM
- **Electrodiagnostics:**
 - ERG/VEP//EOG
 - NFA

REFERENCE :

1. Primary care optometry-theodore Grosvenor

BASIC AND ADVANCED LIFE SUPPORT(IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS,TRIAGE-Primary Survey,Secondary Survey,Airway & Ventilatory management ,Shock, Central & peripheral venous access,Thoracic trauma – Tension pneumothorax,Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma,Head trauma,Musculoskeletal trauma,Electrical injuries,Thermal burns,Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support,Defibrillation,Drugs used in ACLS,Emergency cardiac pacing,AED,Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER-V

| S.NO | SUBJECT |
|-------------|---|
| 1 | Ocular Diseases - I Theory (UE) |
| 2 | Ocular diseases-II Theory (UE) |
| 3 | Visual Optics -Theory (UE) |
| 4 | Visual Optics -Practical (UE) |
| 5 | Environmental science and Community medicine – Theory(IE) |

SEMESTER-V
OCULAR DISEASES –I -THEORY (UE)

Eyelids:

- Eyelid anatomy
- Congenital and developmental anomalies of the Eyelids
- Blepharospasm
- Ectropion
- Entropion
- Trichiasis and symblepharon
- Eyelid inflammations
- Eyelid tumours
- Ptosis
- Eyelid retraction
- Eyelid trauma

Lacrimal system

- Lacrimal system
- Lacrimal Pump
- Methods of lacrimal evaluation
- Congenital and developmental anomalies of the lacrimal system
- Lacrimal obstruction
- Lacrimal sac tumour
- Lacrimal trauma

Sclera, Episclera

- Ectasia and staphyloma
- Scleritis, episcleritis

Orbit

- Orbital anatomy
- Incidence of orbital abnormalities
- Methods of orbital examination
- Congenital and developmental anomalies of the orbit
- Orbital tumours
- Orbital inflammations
- Sinus disorders affecting the orbitOrbital trauma

Conjunctiva and Cornea

- Inflammation:
 - Therapeutic principles
 - Specific inflammatory diseases
- Tumours
 - Tumours of epithelial origin
 - Glandular and adnexal tumours
 - Tumours of neuroectodermal origin
 - Vascular tumours
 - Xanthomatous lesions
 - Metastatic tumours
- Degenerations & dystrophies:
 - Definitions
 - Degenerations
 - Dystrophies
- Miscellaneous conditions:
 - Keratoconjunctivitis Sicca (K Sicca)
Tear function tests
 - Stevens – Johnson syndrome
Ocular Rosacea
 - Atopic eye disorders
 - Benign mucosal pemphigoid (BMP) – ocular pemphigoid
Vitamin A deficiency
 - Metabolic diseases associated with corneal changes
- **Iris, Ciliary body and Pupil**
 - Congenital anomalies
 - Primary and secondary disease of iris and ciliary body
 - Tumors
 - Anomalies of papillary reactions
- **Choroid**
 - Congenital anomalies of the choroids
 - Diseases of the choroid
 - Tumours

REFERENCE BOOKS:

1. Jack J. Kanski: Clinical Ophthalmology, Butterworths, 2nd Ed., 1989.

OCULAR DISEASES -II THEORY (UE)

Vitreous

- Developmental abnormalities
- Asteroid hyalosis
- Vitreous haemorrhage
- Blunt trauma and the vitreous
- Inflammation and the vitreous
- Parasitic infestations
- Vitreous complications in cataract surgery

Retina

- Retinal vascular diseases
- Diseases of the choroidal vasculature, Bruch's membrane and retinal pigment epithelium (RPE)
- Retinal tumors
- Retinoblastoma
- Phakomatoses
- Retinal vascular anomalies
- Retinal and optic nerve head astrocytomas
- Lymphoid tumors
- Tumors of the retinal pigment epithelium
- Other retinal disorders
- Retinal inflammations
- Metabolic diseases affecting the retina
- Miscellaneous disorders
- Retinal physiology and psychophysics
- Hereditary macular disorders (including albinism)
- Peripheral retinal degenerations
- Retinal holes and detachments
- Intraocular foreign bodies
- Photocoagulation

Neuro-ophthalmology

- Neuro-ophthalmic Examination
- History
- Visual function testing
- Technique of papillary examination
- Ocular motility

- Visual sensory System
- The retina
- The optic disc
- The optic nerve
- Disorders of visual integration
- Ocular motor system
- Supranuclear control of eye movements
 - Saccadic system
 - Clinical disorders of the saccadic system
 - Gaze palsies
 - Progressive supranuclear palsy
 - Parkinson's disease
 - Ocular motor apraxia
 - Ocular oscillation
- Smooth pursuit system and disorders
- Vergence system
- Nystagmus
- The Facial nerve
- Selected systemic disorders with neuro-ophthalmic signs

Lens

- Anatomy and pathophysiology
- Normal anatomy and aging process
- Developmental defects
- Acquired lenticular defects

Trauma

- Anterior segment trauma
- Posterior segment trauma

Blindness

- Blindness – definitions
- Causes
- Social implications
- rationale in therapy
- Drug induced ocular disease

REFERENCE BOOKS:

1. Jack J. Kanski: Clinical Ophthalmology, Butterworths, 2nd Ed., 1989

VISUAL OPTICS -THEORY (UE)

VISUAL OPTICS-I

UNIT-I

Review of Geometric Optics

- Vergence and power
- Conjugacy, object space and image space
- Sign convention
- Spherical refracting surface
- Spherical mirror; catoptric power
- Cardinal points
- Magnification

UNIT-II

Optics of Ocular Structures

- Cornea and aqueous
- Crystalline lens
- Vitreous Curvature of the lens and ophthalmophakometry
- Axial and axis of the eye

UNIT-III

Measurement of the optical constants of the eye

- Corneal curvature and thickness
- Keratometry
- Curvature of the lens and ophthalmophakometry
- Axial and axis of the eye

UNIT-IV

Refractive anomalies and their causes

- Aetiology of refractive anomalies
- Contributing variabilities and their ranges
- Populating distributions of anomalies
- Optical component measurements
- Growth of the eye in relation to refractive errors

VISUAL OPTICS II

UNIT-I

Refractive conditions

- Emmetropia
- Myopia

- Hyperopia
- Astigmatism
- Anisometropia and Aniseikonia
- Presbyopia
- Aphakia and Pseudo aphakia
- Correction and Management of Amblyopia

UNIT-II

- Far and near points of accommodation
- Correction of spherical ametropis
- Axial versus refractive ametropia
- Relationship between accommodation and convergence; A/c ratio

UNIT-III

- Retinoscopy – principles and methods
- Retinoscopy – speed of reflex and optimum condition
- Retinoscopy – dynamic/static
- Review of objective refractive methods
- Review o f subjective refractive methods
- Cross cylinder method for astigmatism, Astigmatic Fan test
- Difficulties in objective tests and their avoidance
- Transposition of lenses
- Spherical equivalent
- Prescribing prisms
- Binocular refraction

UNIT-IV

- Effective power of spectacles; vertex distance effects
- Ocular refraction versus spectacle refraction
- Ocular accommodation versus spectacle accommodation
- Spectacle magnification and relative spectacle magnification
- Retinal image blur; depth of focus and depth of field

REFERENCE BOOKS:

1. Abrams D: Duke elders Practice of Refraction, Edition 9, 1998
2. Bennett & Rabbetts: Clinical visual Optics
3. David O Michaels: Visual Optics & Refraction (DOM)

VISUAL OPTICS- PRACTICALS (UE)

VISUAL OPTICS –I

1. Study of Purkinje images I and II
2. Study of Purkinje images III and IV
3. Measurement of corneal curvature
4. Measurement of Corneal thickness
5. Mathematical models of the eye –emmetropia
6. Mathematical models of Hypermetropia
7. Mathematical models of myopia
8. Conjugate points – demonstration – worked examples
9. Axial and refractive hyperopia – worked examples
10. Axial and refractive myopia – worked examples
11. Visual acuity charts
12. Effect of lenses in front of the eye
13. Effect of prisms in front of the eye
14. 14. Vision through pinhole, slit, filters, etc

VISUAL OPTICS II

1. Photometry
2. Visual acuity, stereo acuity in emmetropia
3. Myopia and pseudomyopia, myopia and visual acuity
4. Myopic correction – subjective verification – monocular and binocular
5. Hypermetropia – determination of manifest error subjectively
6. Hypermetropic correction: subjective verification
7. Demonstration of astigmatism. Use of slit and Keratometry to find the principal meridians
8. Astigmatism: fan – subjective verification tests
9. Astigmatism: Cross-Cyl. – Subjective verification test
10. Measurement of accommodation: near and far points and range
11. Presbyopic correction and methods: accommodative reserve, balancing the relative accommodation and cross grid test
12. Methods of differentiating axial and refractive ametropia
13. Practice of Retinoscopy – Emmetropia
14. Practice of Retinoscopy – Spherical ametropia
15. Practice of Retinoscopy – Simple astigmatism
16. Practice of Retinoscopy – Compound hyperopia
17. Practice of Retinoscopy – Compound myopia
18. Practice of Retinoscopy – Oblique astigmatism
19. Practice of Retinoscopy – in media opacities
20. Practice of Retinoscopy – in irregular astigmatism
21. Practice of Retinoscopy – in strabismus and eccentric fixation
22. Interpretation of cycloplegicretinoscopic findings

23. Prescription writing
24. Binocular refraction
25. Photo refraction
26. Vision therapy
27. Exercises for vergence

ENVIRONMENTAL SCIENCE AND

COMMUNITY MEDICINE (IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.
Air pollution & its effects. Prevention & Control of air pollution
Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

RECOMMENDED TEXT BOOKS:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

Reference:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by Banarsidas Bhanot

SEMESTER - VI

| S.NO | SUBJECT |
|-------------|--|
| 1 | Optometric optics-Theory(UE) |
| 2 | Orthoptics and Dispensing Optics-Theory(UE) |
| 3 | Low vision aids & contact lens-Theory (UE) |
| 4 | Low vision aids & contact lens -Practical (UE) |
| 5 | Healthcare and basic principles (IE) |

SEMESTER VI

OPTOMETRIC OPTICS-THEORY (UE)

UNIT I

Spectacle lenses:

- Introduction to spectacle lenses Forms of lenses
- Cylindrical and spherocylindrical lenses
- Properties of crossed cylinders
- Toric lenses
- Toric transportation
- Astigmatic lenses
- Axis direction of astigmatic lenses
- Obliquely crossed cylinders
- Sag formula
- Miscellaneous spectacle lenses
- Vertex distance and vertex power
- Tilt induced power
- Aberrations in ophthalmic lenses
- Fresnel prisms, lenses and magnifiers

UNIT II

Spectacle lenses:

- Manufacture of glass
- Lens surfacing
- Principle of surface generation and glass cement

Lens quality:

- Faults in lens material
- Faults on lens surface
- Inspecting the quality of lenses
- Toughened lenses

Ophthalmic lenses

- Definition of prisms; units of prism power
- Thickness difference and base – apex notation
- Dividing, compounding and resolving prisms
- Rotary prisms and effective prism power in near vision
- Prismatic effect, decentration, Prentice's rule
- Prismatic effect of spherocylinders and plano cylinders
- Differential prismatic effects

Spectacle frames

- Frame types and parts
- Classification of spectacle frames – material, weight, temple position, coloration
- Frame construction, frame measurements and markings

UNIT III

- Tinted and protective lenses
- Characteristics of tinted lenses
- Absorptive glasses
- Polarizing filters
- Photochromic filters
- Reflecting filters
- Bifocal lenses
- Trifocal lenses
- Progressive addition lenses
- Lenticular lenses
- Reflections from spectacle lenses, ghost images, reflections in bifocals at the dividing line
- Anti-reflection coating, Anti-scratch coating, Anti-fog coating, Mirror coating, Edge coating, hard multi coating (HMC)
- Field of view of lenses
- Size, shape and mounting of ophthalmic lenses
- Aspherical lenses

Reference Books:

1. M.Jalie: Principles of Ophthalmic Lenses, Edition 3, 1980
2. T E Fannin& T Grosvenor: Clinical Optics,1996

ORTHOPTICS AND DISPENSING OPTICS- THEORY (UE)

ORTHOPTICS

UNIT-I

- Spatial sense
- Evolution of Binocular vision
- Binocular fusion, suppression, rivalry and summation
- Visual direction, local sign and corresponding points
- Visual distance, empirical cues
- Panum's space
- Stereopsis
- Development of Binocular vision
- The longitudinal horopter
- Neural aspects of Binocular vision

UNIT-II

- Visually guided behaviour and anisokonia
- ARC
- Qualitative and quantitative diagnosis of strabismus
- Esodeviations
- Exodeviations
- A-V phenomena
- Cyclovertical squint
- Pseudo strabismus

UNIT-III

- Amblyopia and eccentric fixation
- Treatment of amblyopia
- Special forms of strabismus
- Nystagmus
- Non-surgical management of strabismus
- Review of orthoptic procedures

REFERENCE BOOKS:

1. R W Reading: Binocular Vision- Foundations and Applications
2. Basic Science, A.A.O (section-6) Pediatric Ophthalmology and Strabismus 1992-1993

DISPENSING OPTICS

UNIT-I

- Clinical experiences in verification and dispensing of ophthalmic materials outlined in Ophthalmic Optics.(Optometric Optics)Course and Dispensing Optics
- Special practical instructions in centering, marking and mounting the lenses of all designs, types, shapes and sizes in accordance with frame and facial measurements
- Visit to lens manufacturing workshops
- Video session on fitting of progressive lenses

UNIT-II

- ANSI standards Dispensing
- Instrumentation Pupillometer
 - Pliers
 - PCD
 - Air blower
 - Distometer
- Abbe's value, specific gravity, optical density, Pantoscopic flit
- Patients selection, fitting Ms of PALs, Selection of designs
- case study : problems, orientated dispensing optics
- Recent developments
- Special purpose frames
- Safety wear

UNIT-III

- Optic center marking
- PD Measurement – for far and near
- Pupillometer
- Tints and filters to be shown – indications
- Different types of Bifocals to be shown
- PALs fitting

REFERENCE BOOKS:

1. Clifford W Brooks & Irvin M Borish: System of Ophthalmic Dispensing, Professional press,197

LOW VISION AIDS & CONTACT LENS –THEORY (UE)

LOW VISION AIDS

UNIT-I

- Identifying the low vision patient
- History
- Diagnostic procedures in low vision case management
- Optics of low vision aids
- Refraction, special charts. I Radical retinoscopy
- Evaluating near vision: Amsler grid and field defects, prismatic scanning
- Demonstrating aids – optical, Non-optical, Electronic

UNIT-II

- Teaching the patient to use aids including eccentric viewing training when necessary
- Guidelines to determining magnification and selecting low vision aids for distance, intermediate and near
- Spectacle mounted telescopes and microscopes
- Children with low vision
- Choice of tests, aids in different pathological conditions

UNIT-III

- Light, glare and contrast in low vision care and rehabilitation
- Biopic telescopes
- Optical devices to help people with field defects
- Contact lens combined system
- Rehabilitation of the Visually handicapped

REFERENCE BOOKS:

1. C.Dickinson : Principles and Practice of Low Vision, Butterworth- Heinemann Publication, 1998

CONTACT LENS

UNIT-I

- History of contact lens
- Corneal Anatomy and Physiology
- Corneal Physiology and Contact Lens
- Preliminary Measurements and Investigations
- Slit lamp Biomicroscopy
- Contact lens materials

UNIT-II

- Optics of Contact lenses
- Glossary of Terms: Contact Lenses
- Indications and Contra Indications of CL
- Rigid gas permeable contact lens design
- Soft contact lens design
- Keratometry, Placido's disc, Topography
- Fitting philosophies (Introduction to Contact lens fitting)
- Handling of contact lenses

UNIT-III

- Fitting of spherical Soft CL and effects of parameter changes
- Astigmatism; Correction options
- Fitting spherical RGP CL. Low DK High DK
- Effects of RGP CL parameter changes on lens fitting
- Fitting in Astigmatism
- Fitting in Keratoconus
- Fitting in Aphakia, Pseudophakia
- Lens care & Hygiene Instructions Compliance
- Follow up post fitting examination
- Follow up slit lamp examinations
- Cosmetic Contact lenses
- Fitting contact lens in children

UNIT-IV

- Toric Contact lenses
- Bifocal contact lenses
- Continuous wear and extended wear lenses

- Therapeutic lenses / bandage lenses
- Contact lens following ocular surgeries
- Disposable contact lenses, Frequent replacement and lenses
- Use of Specular Microscopy and Tachymetry in CL

UNIT-V

- Care of contact lenses, Contact lens solutions
- Complications of Contact lenses
- Contact lens modification of finished lenses
- Instrumentation in contact lens practice
- Checking finished lens parameters
- Contact lens – Special purposes – Swimming, Sports, Occupational etc.,
- recent developments in Contact lenses
- Review of lenses available in India
- Current contact lens research

Reference Books:

1. Robber B Mandell: Contact lens Practice, hard and flexible lenses, Charles C. Thomas, 3rd Edition, 1981, Illinois, USA
2. Ruben M Guillon: Contact lens practice, 994, 1st Edition

LOW VISION AIDS & CONTACT LENS –PRACTICAL (UE)

LOW VISION

Practicals:

1. Refraction, special charts.1 Radical retinoscopy
2. Evaluating near vision: Amsler grid and field defects, prismatic scanning
3. Demonstrating aids – optical, Non-optical, Electronic
4. Guidelines to determining magnification and selecting low vision aids for distance, intermediate and near
5. Spectacle mounted telescopes and microscopes
6. Choice of tests, aids in different pathological conditions
7. Contact lens combined system
8. Rehabilitation of the Visually handicapped

CONTACT LENS

Practicals:

- **Preliminary examination of CL candidate**
 1. Anterior segment evaluation
 - a) Slit lamp examination of anterior segment
 - b) Assessment of corneal sensitivity
 - c) Lid tonus
 - d) Blink rate and type
 2. Assessment of tears
 - a) Schirmer's test I & II
 - b) TBUT
 - c) Tear prism height
 3. Measurement of ocular dimensions
 - a) HVID & VVID
 - b) Palpebral aperture
 - c) Corneal curvature
 - d) Measurement of pupil size in normal (room light), dim and bright illumination
 - e) Selection of trial contact lens parameters (from HVID, keratometry reading, and subjective acceptance). Writing trial lens parameters.

- Identification of type of contact lens – soft, RGP, soft toric, scleral, cosmetic, prosthetic, lenses for keratoconus (Rose-K, keraSoft, hybrid, etc)
- Contact lens verification – CL power, total diameter, blends (in RGP), base curve, type, quality
- Insertion & Removal of contact lens
 - a) Identification of correct side of soft contact lens (Taco test)
 - b) Insertion & Removal of soft contact lenses
 - c) Insertion & Removal of RGP contact lenses
 - d) Cleaning procedure for soft & RGP contact lenses
- Soft CL Fit assessment, over-refraction & final lens parameters
- Fitting principle in toric soft contact lenses
- Fit assessment of RGP contact lenses – observation of static & dynamic fitting characteristics in steep, flat and optimum fitting RGP lenses.
- Examination of old contact lens patient
 - a) CL examination for deposits, tear, scratches, type of lens
 - b) Vision, comfort, ocular changes, old CL fit assessment & over-refraction

SEMESTER-VII

| S.NO | SUBJECT |
|------|---|
| 1 | Project/ Dissertation |
| 2 | Bio-statistics and research methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

UNIT-I Statistics Definition and Terms

- What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability:

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution :

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation :

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error– significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK MahajanJaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S SundarRao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publicatonspvt ltd, 2008
4. Introductory Statistics. PremS.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences,Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)
MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. Operation Theatre and Anesthesia Technology

Regulation, Curriculum and Syllabus

2017



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed

the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the B.Sc Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN-

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks

DURATION -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

Max marks:80

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment**20 marks**

- Based on CAT Exams

TOTAL**100 Marks****Practicals Pattern****Max marks:80**

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment**Max marks:20**

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.

- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.
 - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.

g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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(Declared u/s.3 of the UGC Act, 1956)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Lecture | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (OT AND ANAESTHESIA TECHNOLOGY)

TOTALHOURS: 420

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|----------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy & Physiology related to Anesthesia Technology -Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Anatomy& Physiology related to Anesthesia Technology Practical (UE) | | 120 hours | - | 20 | | 80 | 100 |
| 3 | Applied Pharmacology And Microbiology Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Applied Pharmacology And Microbiology Practical(UE) | | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Medical Ethics and Bio safety (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (OT AND ANAESTHESIA TECHNOLOGY)

HOURS:420

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|----------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Principles Of Anesthesia - I Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Principles Of Anesthesia - I Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Principles Of Anesthesia - II Theory(UE)) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Principles Of Anesthesia -II Practical(UE) | - | 120 hours | | 20 | - | 80 | 100 |
| 5 | Basics and Advanced Life support(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Sociology(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (OT AND ANAESTHESIA TECHNOLOGY)

HOURS: 390

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|----------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Principles Of Sterilization Techniques-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Principles Of Sterilization Techniques-Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Anesthesia Techniques Including Complications-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Anesthesia Techniques Including Complications-Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Community medicine(IE) | 30 hours | | - | - | 50 | - | 50 |

SEMESTER – VI (OT AND ANAESTHESIA TECHNOLOGY)

HOURS: 390

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anesthesia for specialties (including critical care assistance and ventilation) paper – I Theory(UE) | 60 hours | - | 20 hours | - | 80 | - | 100 |
| 2 | Anesthesia for specialties (including critical care assistance and ventilation) paper – I Practical(UE) | - | 120 hours | - | 20 hours | - | 80 | 100 |
| 3 | Anesthesia for specialties (including critical care assistance and ventilation) paper – II Theory(UE) | 60 hours | - | 20 hours | - | 80 | - | 100 |
| 4 | Anesthesia for specialties (including critical care assistance and ventilation) paper – II- Practical(UE) | - | 120 hours | - | 20 hours | - | 80 | 100 |
| 5 | Healthcare and basic Principles(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII (OT AND ANAESTHESIA TECHNOLOGY)

Project/Dissertation

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|---|-----------------|-----------|-----------------------------------|------|--|------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation (UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Statistics and Research Methodology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII & VIII (OT AND ANAESTHESIA TECHNOLOGY)

Internship -1 YEAR

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Latissimusdorsi

- c. Biceps
- d. Triceps
- e. Deltoid
- 4. Nervous System**
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - d. Spinal Cord
- 5. Special Senses**
 - a. Tongue
 - b. Ear
 - c. Skin
 - d. Eye ballSS
- 6. Viva Voce**
 - a. Radiology – Xrays
 - b. Osteology
 - c. Charts
 - d. Models
 - e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1 Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure,classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic.Blood and body fluids

- Body fluid volumes,compartments,and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration,Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II. Estimation of Hemoglobin

III. RBC

IV. WBC

V. Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters

- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahlihemocytometer
- Neubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**

- Pituitary gland
- Pineal body
- Thyroid & parathyroid gland
- Adrenal
- Pancreas
- Gonads – Ovary & Testis

- **Cardio-Vascular System**

- Heart

- **Lymphatic system**

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Saggital section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicals
- Vas deferens
- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.

- Nerve- Classification,injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus , Basal ganglia , Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition,normal values,intrapulmonary and intra pleural pressures,surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis,Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)

-Renal Failure

6. REPRODUCTIVE SYSTEM

-Diseases of testis, uterus, cervix and ovary

7. CNS

-Infections

8. BONES and JOINTS

-Septic Arthritis

-Osteomyelitis

-Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application -Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,

- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

Semester-III

| S.No: | Subject |
|--------------|---|
| 1. | Anatomy & Physiology Theory(UE) |
| 2 | Anatomy & Physiology Practical (UE) |
| 3 | Applied Pharmacology And Microbiology Theory(UE) |
| 4 | Applied Pharmacology And Microbiology Practical(UE) |
| 5 | Medical Ethics and Biosafety (IE) |
| 6 | Psychology (IE) |

SEMESTER-III

ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY- THEORY (UE)

OBJECTIVE

- Expected to have basic knowledge on human anatomy and physiology
- To develop in depth knowledge on anatomy of various organs and structures
- To develop exhaustive ideology of various functions of various structures.

UNIT – I

Respiratory System- Structure and function of the respiratory tract in relation to anaesthesia -Nose, Pharynx, Larynx, Trachea & Bronchial tree – vessels, nerve supply, respiratory tract. Respiratory Physiology-Respiratory muscles – diaphragm, intercostals, Lung volumes-dead space, vital capacity, FRC .Oxygen: properties, storage, supply, hypoxia

UNIT II

Cardiovascular System - Anatomy – Chambers of the heart, circulation, ECG, Blood Pressure. How to measure? Hypotension & Hypertension

UNIT – III

Fluids And Electrolytes/ Blood Transfusion-Body Fluids – Composition, I.V Fluids – composition & administration, I.V Cannulation, Blood grouping, Cross matching, Transfusion indications, hazards.

UNIT – IV

Nervous System- Parts of Central & Peripheral Nervous System, Cerebro spinal fluid

UNIT – V

Reproductive System: Physiological changes in pregnancy and labour

Reference:

Text Books: 1. Human Anatomy ,B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013 2.

Textbook of physiology : A.K.Jain, Fifth edition, Avichal Publishing Company , 2014

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding.
- Will be able to provide better support during surgery.

ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY- PRACTICAL (UE)

OBJECTIVE

- Expected to have basic knowledge on human anatomy and physiology
- To develop in depth knowledge on anatomy of various organs and structures
- To develop exhaustive ideology of various functions of various structures.

PRACTICALS/ DEMONSTRATIONS

1. Model of respiratory tract
2. Spotters –pictures in anatomy and physiology of various systems
3. How to measure blood pressure
4. How to set up things for IV cannulation

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding.
- Will be gaining hand on training in setting up things for IV cannulation.

APPLIED PHARMACOLOGY AND MICROBIOLOGY REALTED TO ANAESTHESIA TECHNOLOGY-THEORY (UE)

Objectives:

- Expected to have basic knowledge on anatomy, physiology and pharmacology.
- To develop knowledge on various drugs and their mechanism of actions.
- To impart knowledge on the adverse effects on various drugs.

APPLIED PHARMACOLOGY

UNIT-I

- **ANTISIALAGOGUES**
Atropine, Glycopyrrolate
- **SEDATIVES I ANXIOLYTICS**
Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, Trichlopho
- **NARCOTICS**
Morphine, Pethidine, Fentanyl, Pentazozine
- **ANTIEMETICS**
Metoclopramide, Ondansetron, Dexamethasone
- **ANTACIDS**
Na citrate, Gelusil, Mucaïne gel.

UNIT-II

- **H₂ BLOCKERS**
Cimetidine, Ranitidine, Famotidine
- **INDUCTION AGENT**
Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate.
- **MUSCLE RELAXANTS**
Depolarising - Suxamethonium,
Non depolarising - Pancuronium, Vecuronium, Atracurium, rocuranium
- **INHALATIONAL GASES**
Gases - O₂, N₂O, Air
Agents - Ether-, Halothane, Isoflurane, Sevoflurane, Desflurane
- **REVERSAL AGENTS**
Neostigmine, Glycopyrrolate, Atropine,
Nalorphine, Naloxone, Flumazenil (Diazepam)
- **LOCAL ANAESTHETICS**

Xylocaine, Preparation, Local – Bupivacaine - Topical,
Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine

UNIT-III

• EMERGENCY DRUGS

- Adrenaline : Mode of administration, dilution, dosage,
- Effects, Isoprenaline
- Atropine, bicarbonate, calcium, ephedrine, xylocard,
- Ionotropes : dopamine, dobutamine, amiodarone
- Aminophylline, hydrocortisone, antihistamines, potassium.
- Cardiovascular drugs
- Antihypertensives
- Antiarrhythmics
- Beta - Blockers
- Ca - Channel blockers.
- Vasodilators - nitroglycerin & sodium nitroprusside
- Respiratory system - Bronchodilators, respiratory stimulants Broncholytic agents
- Renal system - Diuretics, furosemide, mannitol
- Obstetrics - oxytocin, methergin
- Miscellaneous - Antibiotics NSAIDs Anticoagulants and Insulin

APPLIED MICROBIOLOGY

UNIT-IV

- Sterilization & decontamination-I Dry
- Filtration
- Wound Infection & Urinary Tract Infections
- Blood stream Infections
- Respiratory tract Infection
- S. Typhi, Salmonella Paratyphi 'A', Salmonella Typhimurium
- Catheter, IV associated Infections
- Hospital acquired infections & prevention of hospital acquired infections
- Hepatitis C, HBV, HIV
- Hypersensitivity reaction – Type I, II, III, IV

Text Books:

1. Pharmacology for Dental and Allied Health Sciences, Padmaja Udaykumar, Third Edition, Jaypee Brothers Medical Publishers, 2013

Reference Books:

1. Essentials of medical pharmacology, Tripathi, 7th edition, Jaypee Brothers Medical Publishers, 2013

Specific Learning Outcome (SLO):

- Gain knowledge on the mechanism of actions of various drugs along with their adverse effects.
- Able to identify the drug to be used in emergency situations during a surgical procedure.
- Gain knowledge on various NSAIDs and anticoagulants.

APPLIED PHARMACOLOGY AND MICROBIOLOGY REALTED TO

ANAESTHESIA TECHNOLOGY-PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anatomy, physiology and pharmacology.
- To develop knowledge on various drugs and their mechanism of actions.
- To impart knowledge on the adverse effects on various drugs.

PRACTICALS/ DEMONSTRATIONS

- Spotters
- Charts
- Anesthetic induction agents
- Inhalation agents

Specific Learning Outcome (SLO):

- Gain knowledge on the mechanism of actions of various drugs along with their adverse effects.
- Able to identify the drug to be used in emergency situations during a surgical procedure.
- Gain knowledge on various NSAIDs and anticoagulants.

PSYCHOLOGY

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression – Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and

Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd

MEDICAL ETHICS

1. Definition & key terms – ethics Vs law
2. Define Negligence, Malpractice & Liability
3. Influence of Ethics on general practice
4. Professional codes of Ethics
5. Describe primary & Secondary Ethical principles
6. Describe the Moral basis of Informed consent & advance directives
7. Euthanasia and physician – assisted suicide
8. Physicians, patients and other: autonomy, Truth Telling & Confidentiality
9. Reproductive control: Assisted reproduction and Ethics
10. Workers compensation
11. Ethical issues in applied medicine
12. Fertility & Birth control
13. Genetic testing genetic screening.
14. Research Ethics

Semester-IV

| S.No: | Subject |
|--------------|---|
| 1. | Principles of anaesthesia – I Theory (UE) |
| 2 | Principles of anaesthesia - I Practical(UE) |
| 3 | Principles of anaesthesia – II Theory (UE) |
| 4 | Principles of anaesthesia - II Practical (UE) |
| 5 | Basics and advanced life support (IE) |
| 6 | Medical Sociology (IE) |

SEMESTER-IV

PRINCIPLES OF ANAESTHESIA-I THEORY (UE)

Objective:

- Expected to have basic knowledge on basic medical sciences
- To develop ideology of various Equipment used in anesthesia technology.
- To develop knowledge on the principles involved in OT and OT techniques.

UNIT-I

MEDICAL GAS SUPPLY

- Compressed gas cylinders
- Colour coding
- Cylinder valves; pin index.
- Gas piping system
- Recommendations for piping system
- Alarms & safety devices.

UNIT-II

ANAESTHESIA MACHINE

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator
- Flow meter assembly
- Vapourizers - types, hazards, maintenance, filling and draining, etc

BREATHING SYSTEM

- General considerations: humidity & heat
- Common components - connectors, adaptors, reservoir bags
- Pulse oximetry
- EtCo₂ & Capnography
- Methods of humidification.
- Classification of breathing system Mapleson system – a, b, c, d, e, f, Jackson Rees system, Bain circuit
- Non rebreathing valves - ambu valves
- The circle system Components Soda lime, indicators

UNIT-III

FACE MASKS & AIRWAY LARYNGOSCOPES

- Types, sizes
- Endotracheal tubes - Types, sizes.
- Cuff system
- Fixing, removing and inflating cuff, checking tube position complications.
- Bougie
- LMA

UNIT-IV

- Anesthesia Ventilators and Working Principles.

UNIT-V

MONITORING

- ECG
- SpO₂
- Temperature
- IBP
- CVP
- PA Pressure
- LA Pressure
- Bio Medical engineering of Trouble sorting Management, care of cleaning

Text Books:

1. The Anesthesia Technician and Technologist's Manual, Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana, 1st edition, Lippincott Williams & Wilkins, 2012

Reference Books:

Anesthesia Equipment, Principles and Applications (Expert Consult: Online and Print),2: Anesthesia Equipment Clinical Key 2012

Specific Learning Outcome (SLO):

- Gain knowledge on various codes and safety devices.
- Learn the importance of endotracheal tubes and laryngoscopes in anesthesia.
- Learn about the machines and gain knowledge on OT and OT techniques.

PRINCIPLES OF ANAESTHESIA-I PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on basic medical sciences
- To develop in depth knowledge on concepts of pathological conditions.
- To develop exhaustive ideology of techniques in regional and general anesthesia

PRACTICALS/ DEMONSTRATION:

1. Cylinders,
2. Suction apparatus,
3. Endotracheal tubes,
4. Laryngoscopes,
5. LMA,
6. Oropharyngeal airway, Nasopharyngeal airway
7. Anesthesia machine- description, parts, safety features

Specific Learning Outcome (SLO):

- Gain knowledge on various codes and safety devices.
- Learn the importance of endotracheal tubes and laryngoscopes in anesthesia.
- Learn about the machines and gain knowledge on OT and OT techniques

PRINCIPLES OF ANAESTHESIA- II THEORY (UE)

Objective:

- Expected to have basic knowledge on basic medical sciences
- To develop in depth knowledge on concepts of pathological conditions.
- To develop exhaustive ideology of techniques in regional and general anesthesia

BASIC ANAESTHETIC TECHNIQUES INTRODUCTION TO ANAESTHESIA

- General Anesthesia * Regional Anesthesia * Local Anesthesia* Intravenous Anesthesia
- Minimum standard of anesthesia
- Who should give anesthesia?

PRE-OP PREPARATION:

- Pre anesthetic assessment~ History – , past history - disease / Surgery / and personal history - Smoking / alcohol
- General physical assessment, systemic examination – CVS, RS, CNS

INVESTIGATIONS

- Routine - Urine
 - Hematological - their significance
 - E.C.G.
 - Chest X – ray
 - Echocardiography
 - Angiography
 - Liver function test
 - Renal function test
 - Others
- Case acceptance: ASA grading - I, II, III, IV. V

PRE - ANAESTHETIC ORDERS:

- Patient - Informed consent

- Npo guidelines
- Premedication - advantages, drugs used
- Special instructions - if any
- Machine - Checking the machine O₂, N₂O, suction apparatus Laryngoscopes, et tubes, airways
 - Things for IV accessibility
 - Other monitoring systems
- Drugs - Emergency drugs

Anaesthetic drugs

INTRAOPERATIVE MANAGEMENT

- Confirm the identification of the patient
- Monitoring - minimum
- Noninvasive & Invasive monitoring
- Induction - drugs used
- Endotracheal intubation
- Maintenance of anaesthesia
- Positioning of the patient
- Blood / fluid & electrolyte balance
- Reversal from anaesthesia - drugs used
- Transferring the patient
- Recovery room – set up and things needed

POST OPERATIVE COMPLICATIONS & MANAGEMENT

- Recovery and Delayed recovery
- Hypoxia and Oxygen Therapy
- PONV

Text Books:

1. The Anesthesia Technician and Technologist's Manual, Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana, 1st edition, Lippincott Williams & Wilkins, 2012

Reference Books:

Anesthesia Equipment, Principles and Applications (Expert Consult: Online and Print), 2: Anesthesia Equipment ClinicalKey 2012

Specific Learning Outcome (SLO):

- Gain knowledge on history of anesthesia, pre and post - operative assessment.
- Learn the investigations and pre-anesthetic orders required for patient to be anesthetized.
- Gain knowledge on the management of complications and anesthetic considerations.

PRINCIPLES OF ANAESTHESIA- II PRACTICAL (UE)

Objective:

- Expected to have basic knowledge on basic medical Sciences
- To develop knowledge on the principles of sterilization.
- To impart the techniques involved in sterilization in relation to anesthesia

PRACTICALS/ DEMONSTRATIONS

Checking the machine

O₂, N₂O, suction apparatus

Laryngoscopes, Endotracheal tubes, airways

- Things for IV accessibility
- Other monitoring systems

Case acceptance: ASA grading - I, II, III, IV, V

Specific Learning Outcome (SLO):.

- Learn the preparation of OT based on the type of patients and methods of sterilization.

- Gain knowledge on various positions in surgery.
- Gain knowledge on disinfectants and their importance.

BASIC AND ADVANCED LIFE SUPPORT

1. BLS
2. TRIAGE
3. Primary Survey
4. Secondary Survey
5. Airway & Ventilatory management
6. Shock
7. Central & peripheral venous access
8. Thoracic trauma – Tension pneumothorax
9. Other thoracic injuries
10. Abdominal trauma – Blunt injuries
11. Abdominal trauma – Penetrating injuries
12. Spine and spinal cord trauma
13. Head trauma
14. Musculoskeletal trauma
15. Electrical injuries
16. Thermal burns
17. Cold injury
18. Pediatric trauma
19. Trauma in pregnant women
20. Workshop BLS
21. Workshop cervical spine immobilization
22. Imaging studies in trauma
23. The universal algorithm for adult ECC
24. Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
25. Pulseless electrical activity (PEA) / asystole algorithm
26. Bradycardia treatment algorithm
27. Tachycardia Treatment algorithm
28. Hypotension / Shock
29. Acute myocardial infarction
30. Pediatrics Advanced life support
31. Defibrillation
32. Drugs used in ACLS
33. Emergency cardiac pacing
34. AED
35. Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste Comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co

6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.

7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

Semester- V

| S.No: | Subject |
|--------------|---|
| 1. | Principles of sterilization techniques- Theory (UE) |
| 2 | Principles of sterilization techniques- Practical (UE) |
| 3 | Anaesthesia techniques including complications- Theory (UE) |
| 4 | Anaesthesia techniques including complications - Practical (UE) |
| 5 | Community medicine (IE) |

SEMESTER-V

PRINCIPLES OF STERILIZATION TECHNIQUES-THEORY (UE)

Objectives:

- Expected to have basic knowledge on basic medical Sciences
- To develop knowledge on the principles of sterilization.
- To impart the techniques involved in sterilization in relation to anesthesia

UNIT – I

Layout of OT and Lighting of OT

UNIT II

Cleanliness and sterilization of OT and Anesthesia- Carbolization, fumigation, principles of sterilization – autoclaving, pressure sterilization, boiling, dry heat, gas chemical sterilization, gamma rays sterilization

UNIT – III

OT preparation- Preparation of spinal /epidural/nerve block tray. Preparation of patients for various types of anesthesia including laying out of trolleys, preparation of Boyle's apparatus for administration of anesthesia, precaution to reduce antistatic friction hazards, preparation of sterile field, special precautions in handling patients with sepsis, blood borne infections – Hepatitis B, HCV, HIV, etc, Cleaning and Disinfection of articles and OT various positions during surgeries - lithotomy/kidney/beach chair/lateral/prone

UNIT – IV

Electrical and fire hazards- Prevention of physical, electrical, chemical injuries and hazards to patients
OT pollution and scavenging

UNIT – V

Care and Maintenance of Operation records of OT- Maintenance of septic OT, Use and maintenance of defibrillator, cautery, OT light, suction, emergency light etc., Admission and transfer procedures

Text Books:

1. Principles and Methods of Sterilization in Health Sciences, John J. Perkins, 2nd edition, Charles C Thomas Pub Limited, 1983

Reference Books:

Fundamentals of Surgical Practice, Aljafri A. Majid, Andrew N. Kingsnorth, 1st edition, Cambridge University Press, 1998

Specific Learning Outcome (SLO):

- Gain knowledge on the design of operation theatres.
- Learn the preparation of OT based on the type of patients and methods of sterilization.
- Gain knowledge on the care and maintenance of operation records in OT.

PRINCIPLES OF STERILIZATION TECHNIQUES-PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on basic medical Sciences
- To develop knowledge on the principles of sterilization. in relation to anesthesia
- To impart the techniques involved in sterilization.

PRACTICALS/ DEMONSTRATIONS

1. Disinfectants
2. Methods of sterilization
3. Various positions in surgery

Specific Learning Outcome (SLO):.

- Learn the preparation of OT based on the type of patients and methods of sterilization.
- Gain knowledge on various positions in surgery.
- Gain knowledge on disinfectants and their importance

ANESTHESIA TECHNIQUES INCLUDING COMPLICATIONS – THEORY (UE)

Objective:

- Expected to have basic knowledge on anatomy, physiology, pathology and pharmacology.
- To develop in depth knowledge on anesthesia techniques for various procedures.
- To develop exhaustive ideology of the complications associated with various anesthesia techniques.

UNIT – 1

- To setup the required equipments for general anaesthesia, spinal, epidural, nerve block .

UNIT II

- Monitoring during anesthesia and complications.

UNIT – III

- Monitoring and diagnostic procedures in ICU, Central venous access, ECG monitoring, Invasive hemodynamic monitoring

UNIT – IV

- General care of patient in ICU-Eye, GI tract, Bladder, skin, Case of mechanically ventilated patient, Tracheotomy, humidification, Vascular lines – arterial, venous line, Radiography, Physiotherapy – chest physiotherapy

UNIT – V

- **Regional anesthesia**-Introduction, Indication, Contraindication, Check list, Procedure, Complications, Management, Spinal, Epidural, Nerve Block 15.

Text Books:

1. **Regional Anesthesia And Pain Management:** Current Perspectives, Dureja, 3rd edition, Elsevier India, 2007

Reference Books

1. Clinical Anesthesia, Paul G. Barash, 6th edition, Lippincott Williams & Wilkins, 2009

Specific Learning Outcome (SLO):

- Gain knowledge on the setup of required Equipment for anesthesia.
- Gain knowledge on monitoring and diagnostic procedures for anesthesia.
- Learn the general idea on the care of patients for various procedures.

ANASTHESIA TECHNIQUES INCLUDING COMPLICATIONS – PRACTICAL (UE)

Objective:

- Expected to have basic knowledge on anatomy, physiology, pathology and pharmacology.
- To develop in depth knowledge on anesthesia techniques for various procedures.
- To develop exhaustive ideology of the complications associated with various anesthesia techniques.

PRACTICALS/ DEMONSTRATIONS

1. How to assist anesthetists?
2. Monitoring during anesthesia and post-operative period
3. General care of patient in ICU
4. How to assist anesthetist for central venous cannulation

Specific Learning Outcome (SLO):

- Gain knowledge on the setup of required Equipment for anesthesia.
- Gain knowledge on monitoring and diagnostic procedures for anesthesia.
- Learn the general idea on the care of patients for various procedures.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging, and salinity, Energy Resources.
- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem
- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic
- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.
- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.
- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation –Natural history of Disease- Iceberg Phenomenon, Concept of control- Concept of Prevention- Modes of Intervention, Changing pattern of disease.
- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.
- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water: Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution Ventilation: Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

Semester- VI

| S.No: | Subject |
|--------------|--|
| 1. | Anaesthesia for specialties (including critical care assistance and ventilation) paper – I- Theory (UE) |
| 2 | Anaesthesia for specialties (including critical care assistance and ventilation) paper – I- Practical (UE) |
| 3 | Anaesthesia for specialties (including critical care assistance and ventilation) paper – II- theory (UE) |
| 4 | Anaesthesia for specialties (including critical care assistance and ventilation) paper – II-practical(UE) |
| 5 | Healthcare and basic Principles |

SEMESTER-VI

ANAESTHESIA FOR SPECIALTIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – I THEORY (UE)

Objectives:

- Expected to have basic knowledge on anesthesia techniques and principles
- To develop knowledge on anaesthetic techniques for cardiac and Neuroanesthesia.
- To develop knowledge on anaesthesia for shock and trauma.

UNIT – 1

Cardiac anesthesia –PART 1 NYHA classification, Arrhythmias, Angina, Dyspnoea, Premedication, Setting up of monitoring system, Monitoring – invasive and non-invasive,

UNIT II

Cardiac anesthesia –PART 2 Getting ready for the case, Induction of cardiac patient, precautions to be taken, Transferring the patient to ICU, Care to be taken, ICU management

UNIT – III

Neuro Anesthesia- Glasgow coma scale, Signs of raised ICT, Premedication, Check list, Induction of a patient Positioning in neuro surgery, I.C.P monitoring , Air embolism, Transferring to I.C.U / ward

UNIT – IV

Anaesthesia for Trauma & Shock Resuscitation, Pre-op investigation/assessment, Circulatory management, Management of anaesthesia, Rapid sequence induction, other problems.

UNIT – V

CPR- BLS, ACLS

Text Books:

1. Nurse Anesthesia, John J. Nagelhout, Karen L. Plaus, 5th edition, Elsevier Health Sciences, 2014

Reference Books:

1. Basics of Anesthesia, Ronald D. Miller, Manuel Pardo, 6th edition, Elsevier Health Sciences, 2011

Specific Learning Outcome (SLO):

- Gain knowledge on cardiac anesthesia including monitoring setup and management.
- Learn the signs of raised ICT and induction of patient and positioning for neuroAnesthesia.
- Gain knowledge on anesthetic management and rapid sequence induction for trauma and Shock.

ANAESTHESIA FOR SPECIALTIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – I PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.
- To develop knowledge on anaesthetic techniques for cardiac and Neuroanaesthesia.
- To develop knowledge on anaesthesia for shock and trauma.

PRACTICALS/ DEMONSTRATIONS

1. Spotters –basic anaesthetic considerations in cardiac and neurosurgery
2. Charts- BLS chain of survival
3. Demonstration- transferring of post-operative patient to ICU

Specific Learning Outcome (SLO):

- Gain knowledge on cardiac anaesthesia including monitoring setup and management.
- Learn the signs of raised ICP and induction of patient and positioning for neuro-anaesthesia.
- Gain knowledge on BLS chain of survival.

ANASTHESIA FOR SPECIALTIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – II THEORY (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.
- To develop knowledge on anaesthetic techniques for obstetric and pediatric anaesthesia.
- To develop knowledge on anaesthesia outside the O.R.

UNIT-I

Obstetric Anaesthesia (Part 1)- Differences between a pregnant and a normal lady, Risks for anaesthesia, Precautions to be taken, Check list, Regional vs general anaesthesia, Induction / maintenance

UNIT-II

Obstetric Anaesthesia (Part 2)- Resuscitation of the new born, APGAR score, Reversal and extubation, Emergencies – Manual removal of placenta, A.P.H., P.P.H., Ruptured uterus, Ectopic pregnancy, Labour, Epidural analgesia

UNIT-III

Paediatric Anaesthesia - Theatre setting, Check list, Premedication, Induction, Intubations-securing the ETT, Monitoring, Reversal & extubation – problems, Transferring / IC management, Pain management.

UNIT-IV

Day Care Anaesthesia - Special features, Set up, Advantages, Disadvantages, Complications, Future

UNIT-V

Anaesthesia Outside the O.R.- Situations, Cath lab, Radiology and Imaging Science Technology, natural calamities, E.C.T, Features, Shortcomings, Complications

Text Books:

1. Nurse Anesthesia, John J. Nagelhout, Karen L. Plaus, 5th edition, Elsevier Health Sciences, 2014

Reference Books:

1. Basics of Anesthesia, Ronald D. Miller, Manuel Pardo, 6th edition, Elsevier Health Sciences, 2011

Specific Learning Outcome (SLO):

- Gain knowledge on obstetric anesthesia including precautions, induction, reversal and emergencies.
- Learn the theatre setting, monitoring and pain management for pediatric anesthesia..
- Gain knowledge on situations, natural calamities and complications of anesthesia outside the O.R.

ANASTHESIA FOR SPECIALTIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – II PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.
- To develop knowledge on anaesthetic techniques for obstetric and pediatric anaesthesia.
- To develop knowledge on anaesthesia outside the O.R.

PRACTICALS/DEMONSTRATIONS

- 1) Spotters –common obstetric emergencies
- 2) Charts- situations requiring anaesthesia outside operation theatre
- 3) Demonstration-how is pediatric anaesthesia different from adult.

Specific Learning Outcome (SLO):

- Gain knowledge on obstetric anaesthesia including precautions, induction, reversal and emergencies.
- Learn the theatre setting, monitoring and pain management for pediatric anaesthesia..
- Gain knowledge on situations, natural calamities and complications of anaesthesia outside the O.R.

HEALTH AND BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

2. Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

3. Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

7. Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

8. Health Insurance

BIOSTATISTICS AND RESEARCH METHODOLOGY

- 1. What is statistics** – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.
- 2. Measurements** – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
- 3. Data collection** – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
- 4. Cumulative frequency curve** – Ogives – Drawing inference from graph.
- 5. Measures of central tendency** – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
- 6. Measures of variability** – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
- 7. Normal distribution** – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.
- 8. Variants from the normal distribution** – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
- 9. Correlation** – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
- 10. Tests of significance** – need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

Semester VII

| S.No: | Subject |
|--------------|-------------------------------------|
| 1. | Project/ Dissertation |
| 2 | Statistics and research methodology |



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. PHYSICIAN ASSISTANT

Regulations, Curriculum and Syllabus



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:

- i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.

b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN-

SEMESTER-I AND SEMESTER-II (FOR ALL SPECIALITIES)

THEORY **MAX.MARKS-** 60 Marks **DURATION** -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

Max marks:80

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

- | | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |

| | |
|--------------------|----------|
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19.Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.

- ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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UNIVERSITY

(Declared u/s.3 of the UGC Act, 1956)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

| |
|---|
| SEMESTER – I (PHYSICIAN ASSISTANT) |
| TOTAL HOURS : 330 |

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------------|-----------------|------------------------|------------------|--|------------------|---|------------------|--------------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II (PHYSICIAN ASSISTANT)

TOTAL HOURS : 400

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (PHYSICIAN ASSISTANT)**Total Hours: 420 Hrs**

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | General medicine – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | General medicine – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Surgery /Equipments/Anesthesiology Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Surgery /Equipments/Anesthesiology Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Medical Ethics (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Psychology (IE) | 30 hours | - | - | - | 50 | - | 50 |

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory e | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Clinical microbiology – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Clinical microbiology – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Paediatrics& Geriatrics Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Paediatrics& Geriatrics Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Basics and Advanced Life support (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Medical sociology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (PHYSICIAN ASSISTANT)

Total Hours: 420 Hrs

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Cardiology & Cardiac surgery – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Neurology - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 3. | Nephrology/Pulmonology Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Cardiology & Cardiac surgery ,Neurology ,Nephrology/Pulmonology – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Community Medicine (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (PHYSICIAN ASSISTANT)**Total Hours: 420 Hrs**

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|---|-----------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination (University/ Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1. | Gastroenterology/Orthopedics – Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2. | Gastroenterology/Orthopedics – Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3. | Obstetrics & Gynecology Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4. | Obstetrics & Gynecology Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5. | Health Care and Basic Principles(IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6. | Medical sociology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)**Project/Dissertation**

| S.No | PAPER | Hours / Semester | | Evaluation (Marks) | | | | |
|------|-------------------------------------|------------------|-----------|--------------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester Examination | | Total |
| | | | | Project | Viva | Project | Viva | |
| 1. | Project/ Dissertation | - | - | 100 | - | 100 | - | 200 |
| 2. | Statistics and research methodology | 30 hours | - | - | - | - | 50 | 50 |

SEMESTER – VI & VIII (FOR ALL SPECIALITIES)

Internship -1 YEAR

OBJECTIVES

The course builds professional development skills and knowledge, and also provides for students to enhance their academic skills. Physician assistants are health care professionals who are responsible for complete work up of patients in out patient settings, they make the provisional diagnosis and order relevant investigations. They are also involved with providing counsel to patients, explaining disease conditions, initiating treatment, and providing instruction on medications. In the in-patient settings, they work under the supervision of physicians to assist with patient management. They write progress notes and discharge notes as well as communicate with referring doctors or institutions. In the surgical theater, PAs harvest veins for coronary bypass surgery, work as first or second assistant, chart operation notes, and monitor the progress of patients in the intensive care unit. They also prepare homo - grafts for cardiovascular surgeries, work as transplant coordinators,

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** With Names & Number Of Bones
3. **Muscles**
 - a. Trapezius
 - b. Latissimusdorsi
 - c. Biceps
 - d. Triceps
 - e. Deltoid
4. **Nervous System**
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - d. Spinal Cord
5. **Special Senses**
 - a. Tongue
 - b. Ear
 - c. Skin
 - d. Eye ballSS
6. **Viva Voce**
 - a. Radiology – Xrays
 - b. Osteology
 - c. Charts
 - d. Models
 - e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure,classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic.Blood and body fluids

- Body fluid volumes,compartments,and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition &functions of gastric juice.

- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II.Estimation of Hemoglobin

III.RBC

IV.WBC

V.Spotter's

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,

- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose

- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF

- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

- **INSTRUMENTS**

- Westergrens ESR tube
- Sahli hemocytometer
- Neubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland,

penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**

- Pituitary gland
- Pineal body
- Thyroid & parathyroid gland
- Adrenal
- Pancreas
- Gonads – Ovary & Testis

- **Cardio-Vascular System**

- Heart

- **Lymphatic system**

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Saggital section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicals
- Vas deferens
- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition, normal values, intrapulmonary and intrapleural pressures, surfactant.
- Oxygen transport, carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia, cyanosis, Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS**Minerals:**

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION**Nutrition:**

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE**Acid Base Balance:**

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida

4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis
- Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body- A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,

- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER-III

| S.No: | Subject |
|--------------|---|
| 1. | General Medicine |
| 2. | General Medicine – Clinical Rotation (Practical) |
| 3. | Surgery/ Equipments /Anaesthesiology |
| 4. | Surgery/ Equipments /Anaesthesiology– Clinical Rotation (Practical) |
| 5. | Psychology |
| 6. | Medical Ethics |

SEMESTER- III

| S.No: | Subject |
|--------------|--|
| 1. | General Medicine-Theory (UE) |
| 2. | General Medicine –Practical(UE) |
| 3. | Surgery/ Equipments /Anaesthesiology-Theory (UE) |
| 4. | Surgery/ Equipments /Anaesthesiology–Practical(UE) |
| 5. | Psychology(IE) |
| 6. | Medical Ethics(IE) |

GENERAL MEDICINE-THEORY (UE)

Course Objective

- Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the integumentary, respiratory, cardiovascular, endocrine, gastrointestinal, genitourinary, neurologic, musculoskeletal, renal, biliary and hematopoietic systems.
- A case based approach is used to familiarize the physician assistant student with the variety of presentations seen and the treatment options available.

Unit I

- Introduction to medical terminology- roots, prefixes and suffixes, vocabulary Problems - genetics, aging, infection, injury.
- Skeletal system - Bones and ligaments - disorders, diagnosis and treatment.
- Muscular system - skeletal, smooth and cardiac muscles - disorders, diagnosis and treatment

Unit II

- Nervous system - brain, spinal cord, peripheral nerves, sense organs - disorders, diagnosis and treatment
- Endocrine system - disorders, diagnosis and treatment Diagnostic includes - blood work, X-ray and imaging treatment includes - medical and surgical

Unit III

- Cardiovascular system -heart, blood and blood vessels - disorders, diagnosis and treatment
- Respiratory system - air passages, lungs, diaphragm - disorders, diagnosis and treatment
- Integumentary system - skin, hair and nails - disorders, diagnosis and treatment
- Immune and lymphatic system - disorders, diagnosis and treatment
Diagnosis - blood and imaging, Treatment - Medical and surgical.

Unit IV

- Digestive system - mouth, throat, stomach, intestine, liver, gallbladder, pancreas disorders, diagnosis and treatment.
- Urinary system - kidneys, ureters, bladder, urethra- disorders, diagnosis and treatment
- Reproductive system - male and female-disorders, diagnosis and treatment

REFERENCES

1. Davidsons principle and practice of medicine
2. R.Alagappan -Manual of practical med

GENERAL MEDICINE –PRACTICAL (UE)

- By the end of this semester students should gain knowledge about the basic techniques related to General Medicine

Spotters and Practical skills

- History collection
- Recording vitals
- General examination
- Laboratory techniques
 - Phlebotomy
 - collection of blood sample and storage
 - Urine collection / analysis / normal and abnormal values significance
 - Biochemical parameters and their normal and abnormal values / significance
 - Cardiac enzymes – significance / Trop I
 - Viral markers and their significance
 - Culture methods / techniques / swab etc.
 - CSF / Pleural fluid / Ascitic fluid analysis and their significance
 - Mantoux test and its significance
 - Viral markers /HIV testing – interpretation
 - Pregnancy test
- Normal ECG
- Normal chest X ray interpretation
- IV cannula
- IV fluids

SURGERY/ EQUIPMENTS /ANAESTHESIOLOGY-THEORY (UE)

Course objective

- Course presents the fundamentals of care of surgical patients. It will introduce students to the role of the PA in the surgical environment and surgical patient management. This is a practical, case based course focusing on common general surgery topics and skills needed to succeed in a surgery clinical rotation.
- Students will draw on the medical knowledge gained throughout didactic training and apply it in various case scenarios and simulated patient encounters.
- The skill set and knowledge gained will assist the transition from didactic training to becoming a productive part of a surgical inpatient team during clinical rotations.

UNIT I

- History of surgery, role of surgeon, importance of team work, stresses arising during operative procedure , surgical terminology, types of incision and their indications, internal & external hemorrhage - signs and symptoms, management , Tourniquets - use and duration of application and dangers of use. Sutures and surgical instruments.

UNIT II

- Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems:-
 - **Skin** - ulcers, wounds, burns, skin infections (boil, carbuncle, abscess, Cysts (epidermoid, dermoid) tumors (basal cell, squamous cell carcinoma and melanoma).
 - **Head and neck region** - congenital anomalies (cleft lip, cleft palate, branchial cyst and fistula, thyroglossal cyst), parotid and submandibular glands, oral ulcers, Leukoplakia, jaw tumors, squamous carcinoma of oral cavity, pharynx and larynx. Thyroid and lymph nodes swelling.
 - **Arteries**- limb ischemia, non-invasive vascular diagnostic tests, atheromatous disease, aneurysm, Raynaud's syndrome, emboli.
 - **Veins** - Varicose veins, deep vein thrombosis and pulmonary embolism.

UNIT III

- **Breast** - mastalgia, fibro adenoma, cyst, breast abscess, cancer.
- **Oesophagus** - dysphagia, reflux, hiatus hernia, benign and malignant tumors
- **Stomach and duodenum** - peptic ulcer, carcinoma , pyloric stenosis
- **Small intestine** - small bowel obstruction, intestinal tuberculosis.
- **Colon and rectum** - amoebic colitis, ulcerative colitis, colorectal cancer

- **Appendix** - acute appendicitis , acute abdomen
- **Anus** - Haemorrhoids, pruritisani, fissure and fistula-in-ano, anorectal abscesses, cancer Peritoneum and intraperitoneal abscesses,
- **Liver** - trauma, abscess, cancer.
- **Biliary tract** - gall stone disease and carcinoma,
- **Pancreas** - pancreatitis, carcinoma
- **Hernias of abdominal wall**- Inguinal, femoral, umbilical and epigastric
- **Urology**- diagnostic studies, urinary calculi, urinary infection, prostatic hyperplasia, tumors Epididymoorchitis, hydrocele, carcinoma of testicle and penis
- **Neurology** - diagnosis, treatment and rehabilitation of disorders of entire nervous system various procedures like microdissectomy and laminectomy etc.

UNIT IV

- Common equipments /anaesthesiology
- Personal cleanliness and aseptic techniques / dressing techniques / wound care Pre-operative and post-operative care of the surgical patient.
- Emergency procedure - endotracheal intubation, tracheotomyCentral line placement, IVcannulation, Ambu bag ventilation, CPR, Basic Life Support.

REFERENCES

1. Manipal manual of surgery – K.Rajgopalshenoy ,anithashenoy

SURGERY/ EQUIPMENTS /ANAESTHESIOLOGY–PRACTICAL (UE)

OBJECTIVE

- By the end of this semester students should gain knowledge about the equipments uses and basic techniques related to surgery and anaesthesia
 - Personal protective equipments
 - hand wash technique
 - Dressing techniques
 - Cardiac monitor and ventilator settings (basics)
 - Identification and uses of
 - surgical instruments
 - suture materials
 - surgical incisions
 - ET tube ,
 - Tracheostomy tube,
 - Laryngoscope,
 - Ambu bag,
 - Ryles tube,
 - Foleys catheter
 - General Anesthesia
 - Spinal Anesthesia
 - Local Anesthesia

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues; genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

TEXT BOOKS:

1. Medical Ethics - CM Francis 2e, Jaypee publishers, India (2004)
2. Medical Law, ethics, and bioethics - M Lewis and C Tamparo, 4e. FA Davis publishers (1998)
3. Biomedical ethics - Terry O' Neill, Greenhaven Press (1999)

REFERENCE BOOKS:

1. Human factor, a bridge between care and cure, eds. R Tartaglia, S Bagnaro et al. Taylor and Francis(2005)
2. Medical Ethics - Robert Snedden, Steck-Vaughn Publishers, Texas, USA (2000)

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning.Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality.Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship.Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

| S.No: | Subject |
|--------------|--|
| 1. | Clinical Microbiology-Theory(UE) |
| 2. | Clinical Microbiology –Practical(UE) |
| 3. | Paediatrics & Geriatrics -Theory(UE) |
| 4. | Paediatrics & Geriatrics - Practical(UE) |
| 5. | Sociology(IE) |
| 6. | Basic and Advanced Life Support (IE) |

CLINICAL MICROBIOLOGY-THEORY (UE)

OBJECTIVE:

- At the end of the course the student should have a basic understanding of medically important microorganisms, the diseases caused and their laboratory diagnosis
- The mechanism of virulence and pathogenesis and pathology.
- Understand the basic principles of immunology.

UNIT I

- General Principles in Clinical Microbiology
- Collection, processing and handling of various samples, identification and characterization of micro organism
- Laboratory safety
- Quality control
- Antimicrobial susceptibility and antibiotic assays
- Cultivation of microorganisms
- Growth requirements
- Sources of metabolic energy
- Nutrition
- Environmental and other factors affecting growth
- Methods of cultivation

UNIT II

- Sterilization and disinfection in the laboratory
- Microbes versus Humans - disease process, pathogenicity, virulence, immune system.
- Structure and development of the immune systems,
- Cells of the immune system,
- Hypersensitivity reactions

UNIT III

- **BACTERIOLOGY**
 - Gram positive bacteria
 - Gram negative bacteria
 - Acid fast bacilli
 - Spirochetes.
- **VIROLOGY**
 - General properties of all RNA and DNA virus families of medical importance and prions

- Pathogenesis, pathology, epidemiology, treatment prevention and control of viral diseases, classification, rubella, adenovirus, oncogenic viruses (HPV, HBV, EBV, Retroviruses) HIV.

UNIT-IV

- **MYCOLOGY**

- Classification of fungi
- Growth and isolation
- Mycoses (all types)
- Yeasts
- Laboratory diagnosis of mycotic diseases
- Immunity in fungal diseases and value of immuno diagnosis

- **PARASITE**

- General principles of host-parasite interactions, types of infection, immune response and effect of parasites on the host
- Intracellular parasites / Helminths.

UNIT-V

- **APPLIED MICROBIOLOGY**

- Normal flora of the human body
- Collection of clinical specimens for diagnosis and method processing
- Antibiotic susceptibility testing and its interpretation and reporting
- Hospital infection control: policy and practice
- Quality control in diagnostic microbiology
- National programmer for control of infectious diseases
- Laboratory diagnosis of infectious diseases of each system

RECOMMENDED BOOKS:

1. Mackie & McCartney Practical Medical Microbiology 14th edition: Eds: J.G.Colle, A.G. Fraser, B.P. Marmion, A.Simmons- Reprint 2008 Elsevier, New Delhi

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

CLINICAL MICROBIOLOGY-PRACTICAL (UE)

1. PRACTICAL

- a. Culture techniques
 - b. Culture media
 - c. Preparation of media
 - d. Identification of media & their uses
 - e. Culture methods & identification of common bacteria on media.
 - f. Antibiotic sensitivity testing.
2. Psychomotor skills
- a. Microscopy - handling and general maintenance
 - b. staining procedures - preparation of stains and staining Methodology (Routine and special stains)
 - c. Growth and survival of microorganisms
3. Quantitation of microorganism and estimation of microbial colonies by various procedures
4. Basic identification techniques:
5. KOH & LPCB preparation
6. Staining, techniques
7. Culture of Fungi
8. Slide culture
9. The student should be able to perform:
10. ELISA for HIV antibody, HBs Ag and HCV antibody
11. Rapid tests for viral diagnosis
12. Examination of stool for parasites

REFERENCE BOOKS:

1. Medical Microbiology, 3rd edition. Eds: MIMS and others.

RECOMMENDED BOOKS:

1. Koneman's Color Atlas and Text book of Diagnostic Microbiology 6th edn
2. Ananthanarayan and Paniker's Text book of Microbiology 8th edn.

PAEDIATRICS & GERIATRICS – THEORY (UE)

Course Objective

- This course uses a case based learning format to aid the students in understanding the physical and psychosocial fundamentals of normal growth and development, immunizations and health maintenance.
- In addition, it focuses on the presentation of major pediatric disorders and conditions, their signs and symptoms, diagnosis and management and provide an understanding of medical problems of the elderly, including the changes commonly associated with aging

UNIT I

- Definition, population, morbidity and mortality in children ,maternal , perinatal , neonatal , infant and preschool mortality rates, current National Programmes like ICDS, RCH, Vitamin A prophylaxis, UIP,IMCI, Pulse Polio, AFP . ARI.Diarrhoea control programmes.
- Growth and development - anthropometry - Measurement and interpretation of weightlength/height, head circumference, mid-arm circumference.Use of weighing machines, infant meter, interpretation of Growth.
- Charts: Road to health card and percentile growth curves, abnormal growth patterns-failure to thrive, short stature, growth pattern of different organ systems like lymphoid, brain and sex organs, normal pattern of teeth eruption.
- Important milestones in infancy and early childhood in areas of gross motor, fine motor, language and personal - social development, psychological and behavioural problems
- Measurement and interpretation of sitting height, US: LS ratio and arm span
Age- independent antropometric measurement - principles and application.

UNIT II

- Nutrition - normal requirements of carbohydrates, protein, fats, minerals and vitamins for newborn, children, pregnant and lactating mother. Common food sources.
- Breast feeding - colostrum and composition of breast milk, initiation and technique of feeding, hazards and demerits of prelacteal feed, top milk and bottle - feeding. Feeding of LBW babies.Infant feeding /weaning foods, methods of weaning.Assessment of nutritional status of child based on history and physical examination.Characteristics of transitional and mature milk (foremilk and Hind milk) Protein energy malnutrition-definition, classification, features, causes and management.
- Vitamins -etio-pathogenesis, clinical feature, biochemical and radiological findings, differential diagnosis and management of nutritional disorders.Definition, causes and management of obesity

- Immunization: - National immunization programme, vaccine preservation and cold-chain. Vaccination types, contents, efficacy, storage, dose, site, route, contraindications and adverse reactions BCG, DPT, OPV, Measles, MMR and Typhoid. Pulse Polio Immunization, AFP (Acute flaccid paralysis) surveillance. Special vaccines - Hepatitis B, H influenza B, Pneumococcal, Hepatitis A, Chicken Pox, Meningococcal and Rabies.

Unit 3

- Disorders of respiratory system, gastro intestinal tract, central nervous system, cardiovascular system, genitor-urinary system and haematological disorder.
- Infectious disease - epidemiology, basic pathology, symptoms, signs, complications, investigations, differential diagnosis , management and prevention of common bacterial , viral and parasitic infections .
- Special reference to vaccine - preventable disease - Diarrhoea, LRTI, TB, Polio, meningitis, diphtheria, whooping cough, tetanus , measles, mumps, rubella, typhoid, viral hepatitis , cholera, chicken pox, giardiasis, amoebiasis, intestinal helminthiasis, malaria, dengue fever, AIDs , Kala azar , leprosy , chlamydia infection.
- Paediatric emergencies- status epilepticus, status asthmaticus/ acute severe asthma, shock and anaphylaxis, burns, hypertensive emergencies, gastrointestinal bleed, comatose child, congestive cardiac failure, acute renal failure
- Genetics- principles of inheritance and diagnosis of genetic disorders - Down's syndrome

Unit 4:-

- Geriatrics- physiological and psychological fundamentals of aging process
Diet for the aged and management of nutritional disorders
- Disorders of major geriatric ailments and management -
Medical - infections, dehydration, acute confusional state, osteoporosis, Degenerative joint diseases, effects of immobility - prevention of contracture and bedsores.
- Economic and psychosocial needs of the aged. Role of various health care providers including family.

REFERENCES

1. Ghai essential pediatrics – Vinod k paul ,Aravind Bagga

PAEDIATRICS & GERIATRICS – PRACTICAL (UE)

OBJECTIVE

- By the end of this semester students should gain knowledge about the following
 1. Pediatric case sheet writing
 2. Developmental milestones
 3. Immunization schedule
 4. Incubator and its uses
 5. Identification and uses of vaccines
 6. Normal nutritional requirements
 7. BLS (demonstration of basic life support for pediatrics)
 8. Use of weighing machines, infant meter'
 9. Measurement and interpretation of
 - Road to health card
 - percentile growth curves
 - weight length/height
 - head circumference
 - mid-arm circumference.
 - Identification and uses of
 - ET tube
 - Infant feeding tube
 - Iv cannula, splint
 - Laryngoscope
 - Foleys catheter
 - Pediatric face mask
 - Nebulizer
 - Ambu bag

BASIC AND ADVANCED LIFE SUPPORT(IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS, TRIAGE-Primary Survey, Secondary Survey, Airway & Ventilatory management, Shock, Central & peripheral venous access, Thoracic trauma – Tension pneumothorax, Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma, Head trauma, Musculoskeletal trauma, Electrical injuries, Thermal burns, Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support, Defibrillation, Drugs used in ACLS, Emergency cardiac pacing, AED, Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste Comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER-V

| S.No: | Subject |
|--------------|---|
| 1. | Cardiology & Cardiac surgery-Theory(UE) |
| 2. | Neurology-Theory(UE) |
| 3. | Nephrology / Pulmonology-Theory(UE) |
| 4. | Cardiology & Cardiac surgery, Neurology, Nephrology , Pulmonology–Practical(UE) |
| 5. | Environmental Science and Community Medicine(IE) |

CARDIOLOGY & CARDIAC SURGERY-THEORY (UE)

Course Objective

- Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the cardiology, interpretation of ECG ,ECHO ,TMT .
- Orientation to cathlaband gaining knowledge on cardio pulmonary bypass ,ECMO, as well as various adult and pediatric surgical procedures.

UNIT I

- Basics - structural basis of cardiovascular disease, embryology, chambers, heart valves, surface marking, great vessels, blood, cardiovascular disease, cardiac cycle, heart sounds, circulation of blood , cardiovascular responses to exercise, heart failure and compensatory mechanism, cardiac muscle action , coronary perfusion.

UNIT II

- Cardiovascular diseases - symptoms and signs, pulse, BP, JVP
- Congenital heart disease - cyanotic and acyanotic heart diseases
- Hypertension- essential, malignant, systemic and pulmonary hypertensions Arterial diseases - atherosclerosis - risk factors, Burger's disease
- Coronary, Rheumatic heart disease, heart failure, cardiac arrhythmias, cardiomyopathies Peripheral vascular disease, pulmonary thromboembolism,
- Systemic diseases affecting the heart, pregnancy and heart disease, Pericardial diseases, Cardiac trauma, tumors of heart.

UNIT III

- Prevention of heart diseases -Diagnostic tools - ECG, Chest X-ray, ECHO, TMT, Holter, 24 hour ambulatory BP monitoring, blood analysis., etc.
- Cardiac catheterization and coronary angiography- preparation of patient physically and mentally. Pre and post-operative care and rehabilitation programme. PPI
- Importance of life style modification measures.

UNIT IV

- Cardiac surgery ;- Basics - Cardiopulmonary bypass - closed and open heart operation, PDA ligation, closed mitral valvotomy, pulmonary artery banding , block trussing shunt, pericardiectomy, shunt operations, ASD and VSD closure, Tetralogy of Fallot correction, valvular disease surgeries, surgery for transpositions, other corrective surgeries and coronary surgeries.

REFERENCES

1. Davidsons principle and practice of medicine

NEUROLOGY –THEORY (UE)

Course Objective

- Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Neurology, gaining basic knowledge on EEG, EMG, CT/MRI
- A case based approach is used to familiarize student with the variety of rehabilitations like physiotherapy, speech therapy for disability caused by neurological problems

UNIT I

- Nervous system - basics - neurotransmitters- general principles and common transmitters
- Cell membrane - physicochemical properties, permeability and transport, bioelectricity, Genesis of resting membrane potential, action potential, properties of nerve-fibers.
- Neuromuscular junction, Muscle proteins, excitation- contraction coupling, injury and repair of nerves and muscles, work physiology.

UNIT II

- Sensory system -Functional organization of sensory system, perception of sensory stimuli, coding, physiology of pain.
- Motor System - Functional organization of motor system, properties of reflexes, brain stem, stretch, tendon reflexes, basal ganglia, cerebellum and vestibular neck reflexes, maintenance of equilibrium, localizing the level of lesion in neurological diseases
- Visceral and motivational system - autonomic nervous system, hypothalamus, limbic system, emotions, EEG, sleep and wakefulness, learning, memory and speech.

UNIT III

- Neuropathology - Trauma
- Inflammatory disorders- pyogenic and tuberculous meningitis, brain abscess, tuberculoma
- CSF and its disturbances - cerebral edema, raised intracranial pressure
- Cerebrovascular disease - atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction and haemorrhage.

UNIT IV

- Neurological diseases - Clinical examination of nervous system, investigations
- Major manifestations - headache, facial pain, raised intracranial tension, faintness, dizziness, syncope, vertigo.
- Disorders of sleep and movement, sensory disturbances (numbness, tingling and sensory loss), acute confusional state, coma and brain death, Aphasia and focal cerebral disorders, disturbances of brain stem, vision and sphincter.

- Headaches - migraine, cluster and seizures
- Cerebrovascular disease-Dementia, meningitis, encephalitis , cranial nerve diseases, spinal cord diseases , tumours (primary and secondary), Peripheral neuropathies and demyelinating disorders , multiple sclerosis , Parkinson's disease, extrapyramidal disorders, cerebellar disorders. Motor neuron disease, diseases of muscles, neurological manifestations of systemic diseases, nutritional and metabolic diseases of the nervous system

REFERENCES

1. Davidsons principle and practice of medicine

NEPHROLOGY / PULMONOLOGY-THEORY (UE)

Course Objective

- Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Nephrology and Pulmonology.
- A case based approach is used to familiarize student with the variety of diseases and their treatment options like hemodialysis, peritonealdialysis, renal transplant etc.
- Gaining knowledge in patient preparation for bronchoscopy and assisting the procedure.

UNIT I

- Genito- urinary system - basics, innervations of urinary bladder in detail, microscopic structure of the kidney, Juxtaglomerular apparatus, microcirculation of kidney, histopathology of kidney, ureters, urinary bladder and urethra.
- Renal haemodynamics and glomerular filtration- renal function, renal function tests, micturition

UNIT II

- Urinary tract pathology- basis of impaired renal function, urine analysis.
- Glomerulonephritis - classification - primary (proliferative and non-proliferative)
- Secondary glomerulonephritis - (SLE, purpura, polyarteritis, amyloidosis, diabetes, nephritic syndrome) Acute renal failure, progressive renal failure and end stage renal disease Pyelonephritis , reflux nephropathy, interstitial nephritis
- Renal and genitourinary tract tumours - renal cell carcinoma and nephroblastoma, Renal vascular disorders, kidney changes in hypertension
- Urinary bladder - cystitis, carcinoma, urinary tract tuberculosis, urolithiasis and obstructiveuropathy.
- Congenital abnormalities of kidneys and urinary system

UNIT III

- Clinical examination of kidney and genitourinary system- symptoms, signs and investigations.
- Major manifestations - dysuria, pyuria, urethral symptoms
- Disorders of urine volume, haematuria , proteinuria, oedema,
- Obstruction of urinary tract, incontinence, renal involvement in systemic disorders Drugs and kidney, renal replacement therapy

UNIT IV

- Upper airway diseases- basic respiratory mechanics, causes and pathophysiology of hypoxia and hypercapnia.
- Respiratory failure -acute, chronic mechanism and management ,Allergy and bronchial asthma, chronic obstructive lung diseases.
- Restrictive / interstitial lung diseases, pulmonary tuberculosis, occupational lung diseases
- Lung cancer - Primary and secondary, haemoptysis , pneumonia.
- Pleural diseases -Pneumothorax, Pleural effusion.
- Cardiogenic and non-cardiogenic pulmonary odema, Diseases of the Diaphragm and the chest wall.

REFERENCES

1. Davidsons principle and practice of medicine

CARDIOLOGY & CARDIAC SURGERY, NEUROLOGY, NEPHROLOGY,
PULMONOLOGY- PRACTICAL(UE)

OBJECTIVE

- By the end of this semester students should gain knowledge about the following
 1. Case sheet writing
 2. Assessment of communication to the patient
 3. Ryle's tube, Foley's , colostomy , drains care
 4. Basic knowledge about Hemodialysis ,priming , termination ,vascular access , reuse techniques
 5. Giving a common drug strip and asking questions
 6. Basic knowledge about pulmonary function test ,spirometry
 7. Giving an ECG strip and asking basic questions
 8. ECG taking and interpretation - common cases only
 9. LP/ Pleural tapping /ascetic fluid tapping and other common procedures
 10. Normal chest X-ray presentation / common abnormal pattern
 11. Preparing the discharge summaries
 12. Bed sore and its care

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE (IE)

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.

UNIT-II

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

UNIT-III

- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic

UNIT-IV

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

UNIT-V

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

UNIT-VI

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of

disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

UNIT-VII

- **Epidemiology**: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

UNIT-VIII

- **Environmental & health**: Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.
Air pollution & its effects. Prevention & Control of air pollution
Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

RECOMMENDED TEXT BOOKS:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by BanarsidasBhanot

Reference:

1. Textbook of Preventive and Social medicine by k. Park, 21st edition, published by BanarsidasBhanot

SEMESTER-V

| S.No: | Subject |
|--------------|--|
| 1. | Gastroenterology/Orthopaedics-Theory(UE) |
| 2. | Gastroenterology/Orthopaedics -Practical(UE) |
| 3. | Obstetrics &Gynaecology-Theory(UE) |
| 4. | Obstetrics & Gynaecology -Practical(UE) |
| 5. | Health Care and Basic Principles(IE) |

GASTROENTEROLOGY/ORTHOPAEDICS-THEORY (UE)

Course Objective

- Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Gastroenterology and orthopedic .
- A case based approach is used to familiarize student with the variety of diseases and their treatment options as well as trauma patient care ,emergency procedures .
- Gaining knowledge on patient preparation for endoscopy and assisting the procedure.

UNIT I

- Clinical gastroenterology - Basics, functions and physiology of defecation
- Preventive gastroenterology- obesity, GI disorders, constipation, diarrhea and dysentery
- Surgical asepsis and hygienic endoscopy room - preparation of sterile field - preparation of tables, equipments, instruments for the procedure, giving oral anaesthetic agent, transfer and positioning of the patient, care of the room before , during and after the endoscopy procedure, special precautions in handling patients with sepsis, blood borne infection - Hepatitis B, HCV, HIV etc, cleaning and disinfection , terminal disinfection,
- Basic endoscopy unit - forward viewing, single channel and double channel endoscopy and specific instruments used in endoscopic and colonoscopic procedures.

UNIT II

- Ortho - basics, ossification of bones of the limbs for age determination, X-rays of bones, process of repair of bone. Infections - osteomyelitis, tuberculosis, mycetoma.
- Metabolic diseases - rickets /osteomalacia, osteoporosis, hyperparathyroidism
- Tumours- Primary - Osteosarcoma, Osteoclastoma, Ewing's sarcoma, chondrosarcoma and Secondary tumors Arthritis - Rheumatoid, osteo arthritis/ ankylosing spondylitis.

UNIT III

- Fracture - definition, classification, management, fracture healing, delayed union, open fractures, management of fracture clavicle, shaft of humerus and dislocation of shoulder.
- Classification of injuries around the elbow and management of supracondylar fracture and dislocation of elbow, Monteggia fracture dislocation and fracture of both bones of forearm, Volkamann's ischemic contracture, fracture lower end of radius, scaphoid and metacarpal fracture.
- Fracture of pelvis and dislocation of hip, fracture neck of femur, trochanter, shaft of femur tibia, fibula and metatarsal.

UNIT IV

- Internal derangements of knee, injuries of ankle and foot, amputations,
- Congenital malformations - CTEV, torticollis , CDH, pseudoarthrosis
- Disorders of hip- Coxavara, Perthes disease. Deformities and disorders of the spine
- Blood transfusion

REFERENCES

1. Natarajans text book of orthopedics and traumatology
2. Essential orthopedics – Maheshwari&mahaskar
3. Davidsons principle and practice of medicine

GASTROENTEROLOGY/ORTHOPAEDICS –PRACTICAL (UE)

OBJECTIVE

- By the end of this semester students should gain knowledge about the following
 1. Types and uses of
 - cast in fractures
 - splints
 2. Identification of fracture in x ray
 3. Patient preparation for
 - endoscopy.
 - colonoscopy
 4. Instruments used in
 - endoscopy ,
 - colonoscopy
 1. Wound care
 2. Trauma patient care
 3. Dealing with an unconscious patient
 4. Care of the terminally ill patient
 5. ICU - protocols
 6. Blood transfusions
 7. Discharge summary preparation

OBSTETRICS & GYNAECOLOGY- THEORY(UE)

Course Objective

- Course provides the student with an overview of commonly encountered obstetric and gynecologic conditions in women's health care.
- Major topics include pregnancy and prenatal care, menopause, lactation, uterine and breast disorders, the menstrual cycle, its hormonal regulation and commonly encountered conditions.

UNIT I

- Bony pelvis - important land marks of obstetrics significance, fetal skull, physiological changes in pregnancy / menopause, Conception, abortions , gestational trophoblastic diseases
- Vulva - cyst, inflammation, neoplasia , dystrophy
- Vagina - cytology, infection, inflammation, neoplasia
- Uterus -endometriosis, adenomyosis , hyperplasia, atrophy, carcinoma Cervix - erosion, infections, malignancy
- Infections - STD, genital TB, HIV, TORCH, vertical transmission of HIV

UNIT II

- Obstetrics- Diagnosis of pregnancy, antenatal care and fetal surveillance, first trimester bleeding, normal and abnormal presentations and positions, dystocia due to bony pelvis, soft tissue, high risk pregnancies, IUGR, IUD, preterm labour, premature rupture of membranes, poly and oligohydramnios, postdated delivery, Prolonged labour, obstructed labour, rupture uterus, previous LSCS, third trimester bleeding, preeclampsia and eclampsia, medical disorders complicating pregnancy, surgical emergencies in obstetrics, Rh iso immunization, partogram, ultra sound in obstetrics, fetal monitoring , active management of labour ,neonatal resuscitation, analgesia and anaesthesia in obstetrics, instrumental deliveries, LSCS, third stage complications, normal and abnormal puerperium , morbidity and mortality, medical auditing in obstetrics.

UNIT III

- Gynecology - Maldevelopment, injuries, infections, cysts , tumors of female genital tract.
- Vulva - inflammation, ulcers, atrophy, dystrophies, cysts, neoplasm
Vagina - leucorrhoea, infections, carcinoma.

- Cervix - erosion, ulcer, dysplasia, carcinoma
- Uterus - prolapse, displacements (inversion and retroversion), endometriosis, abnormal uterine bleeding /post menopausal bleeding, endometrial hyperplasia, benign and malignant tumours.
- Primary and secondary amenorrhoea, infertility, PCOD, assisted reproductive techniques, choriocarcinoma,

UNIT IV

- Urinary system - Stress incontinence, pelvic pain, low back ache Cancer screening for genital malignancy and breast / Pap smear Radiotherapy outline and chemotherapy
- Neonatology: - Neonatal resuscitation, meconium aspiration syndrome, preterm care, RDS, neonatal jaundice, congenital anomalies, birth injuries.

REFERENCES

1. D C DUTTAS text book of gynecology
2. Mudaliar and Menons clinical obstetrics

OBSTETRICS & GYNAECOLOGY –PRACTICAL (UE)

OBJECTIVE

- By the end of this semester students should gain knowledge about the following
 1. Normal delivery
 2. Neonatal care and resuscitation
 3. Obs and Gyn instruments/ sterile techniques / instruments
 4. Rh ISO immunization, partogram
 5. Importance of PAP Smear /terminal care
 6. Preparing the discharge summaries
 7. Basic knowledge of ultra sound in obstetrics, fetal monitoring

HEALTH CARE AND BASIC PRINCIPLES (IE)

UNIT-I Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

UNIT-II . Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

UNIT-III Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

UNIT-IV Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

UNIT-V. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

UNIT-VI. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

UNIT-VII Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

UNIT-VIII Health Insurance

REFERENCE BOOKS:

1. Principles of Hospital Administration and Planning, BM Sakharkar, 2nd edition, Jaypee Brothers, Medical Publishers Pvt. Limited, 2008
2. Hospital Administration And Management : Theory And Practice, R. Kumar S.L. Goel, Deep and Deep Publications, 2007
3. Principles of Management, Mason Andrew Carpenter, Talya Bauer, 3rd edition, Flat World Knowledge, L.L.C., 2010

SEMESTER-VII

| S.NO | SUBJECT |
|-------------|-------------------------------------|
| 1 | Project/ Dissertation |
| 2 | Statistics and research methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

UNIT-I Statistics Definition and Terms

- What is statistics – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

UNIT-II Measurements:

- Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

UNIT-III Data collection:

- Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

UNIT-IV Cumulative frequency curve:

- Cumulative frequency curve – Ogives – Drawing inference from graph.

UNIT-V Measures of central tendency

- Need – types: Mean, Median, Mode – Working out these measures with illustrations.

UNIT-VI Measures of variability :

- Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

UNIT-VII Normal distribution

- General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

UNIT-VIII Variants from the normal distribution :

- Skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

UNIT-IX Correlation :

- Historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

UNIT-X Tests of significance:

- Need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

REFERENCE BOOKS:

1. Methods In Biostatistics BK Mahajan Jaypee, brothers Publication pvt ltd, sixth edition, 2002
2. Introduction to Biostatistics and research methods P.S.S Sundar Rao, J Richard, Prentice-Hall of India pvt ltd, fourth edition, 2006
3. MS Excel 2007 Made Simple, Prof. Satish Jain, BPB Publicatons pvt ltd, 2008
4. Introductory Statistics. Prem S.Mann, John Wiley and sons (Asia) pvt ltd, Fifth edition (2004)
5. Biostatistics A methodology for the health sciences, Gerald Van Belle, Lloyd Fisher, John Wiley and Sons, second edition, 2004.
6. Biostatistics D.Rajalakshmi, G.N. Prabhakaran, Jaypee, brothers Publication pvt ltd, Second edition, 2008



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B.Sc. Renal Dialysis Technology

Regulations, Curriculum and Syllabus

2017



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the **Faculty of Allied Health Sciences**, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.
- b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks

DURATION -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

- (i) Theory 20 Marks
- (ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

| | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- (i) 40% minimum in the University End-Semester Theory examination
- (ii) 40% minimum in the University End-Semester Practical examination
- (iii) 40% of marks in the subject where internal evaluation alone is conducted
- (iv) 40% of aggregate of theory, practical and internal assessment taken together

18.Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19.Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.

- ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

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(Declared u/s.3 of the UGC Act, 1956)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (RENAL DIALYSIS TECHNOLOGY)

TOTAL HOURS : 420

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Applied Anatomy and Physiology related to Renal Dialysis Technology -Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Applied Anatomy and Physiology related to Renal Dialysis Technology -Practicals (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Applied Pharmacology related to Renal Dialysis Technology - Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Applied Pharmacology related to Renal Dialysis Technology - Practicals (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Medical Ethics and Biosafety - Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Psychology - Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (RENAL DIALYSIS TECHNOLOGY)

TOTAL HOURS : 420

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - I Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - I Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - II Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - II Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Basics and Advanced Life Support - Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Medical Sociology - Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (RENAL DIALYSIS TECHNOLOGY)

TOTAL HOURS : 390

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Renal Dialysis Technology - Part I - Paper I Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Renal Dialysis Technology - Part I - Paper I Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Renal Dialysis Technology - Part I - Paper II Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Renal Dialysis Technology - Part I - Paper II Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Environmental Science and Community medicine - Theory (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (RENAL DIALYSIS TECHNOLOGY)

TOTAL HOURS: 390

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|---|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Renal Dialysis Technology – Part II – Paper I Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Renal Dialysis Technology – Part II – Paper I Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Renal Dialysis Technology – Part II – Paper II Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Renal Dialysis Technology – Part II – Paper II Practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Health Care and Basic Principles - Theory (IE) | 30 hours | - | | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|--|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| | | | | | | | | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Bio-Statistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

Objectives

The course of study offers a practical approach to Dialysis. The course of study includes extensive didactic and experiential training that will enable graduates to effectively apply knowledge, experience, analytical skills and expertise to meet the needs of Dialysis practice. Students will learn the principles of renal failure and dialysis, operation of dialysis devices, monitoring treatment and other related topics of dialysis, patient care and treatment. After completing the course, the student will obtain adequate skills and knowledge to perform various procedures and operate dialysis equipment under physician's supervision. A dialysis technologist can set up, evaluate, operate, and troubleshoot dialysis machines, and this knowledge can be used to find work in quality control or other areas in dialysis machine manufacturing. The technologist is also trained to monitor the condition of the patient, including taking vital signs and other medical evaluation criteria.

SEMESTER - I

| S.No | Subject |
|-------------|----------------------|
| 1. | Anatomy – I(UE) |
| 2. | Physiology –I (UE) |
| 3. | Biochemistry - I(UE) |
| 4 | Microbiology - I(UE) |
| 5. | Pathology – I(UE) |
| 6. | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Course description:

- A study of the anatomical structure of the human body.
- Body structure will be studied by organ systems.
- Form-function relationships with emphasis on clinically relevant anatomy.
- The laboratory study will involve observing and learning from human skeletal collections and dissected cadavers and preserved specimens.

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE SYLLABUS

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** With Names & Number Of Bones
3. **Muscles**
 - a. Trapezius
 - b. Lattisimusdorsi
 - c. Biceps
 - d. Triceps
 - e. Deltoid
4. **Nervous System**
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - d. Spinal Cord
5. **Special Senses**
 - a. Tongue
 - b. Ear
 - c. Skin
 - d. Eye ballSS
6. **Viva Voce**
 - a. Radiology – Xrays
 - b. Osteology
 - c. Charts
 - d. Models
 - e. Gluteus Muscles

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

Comprehend basic terminologies used in the field of Human Physiology

Define and describe basic Physiological processes governing the normal functioning of the human body.

Apply this knowledge in their Allied Health Science practice.

Contents

Unit 1

Ia. General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Ib. Nerve and muscle

- Nerve structure,classification of nerve fibres,
- Muscles- classification , structure ,Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism,types.

Ic.Blood and body fluids

- Body fluid volumes,compartments,and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes -Morphologyand functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

IIa. Digestive system

- Salivary glands -Nerve supply , functions of saliva.
- Gastric juice-composition &functions of gastric juice.
- Pancreatic juice-composition , functions and regulation of pancreatic juice.
- Bile- composition , functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

IIb.Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration,Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE SYLLABUS

I. Microscope

II. Estimation of Hemoglobin

III. RBC

IV. WBC

V. Spotters

BIOCHEMISTRY-I (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism

- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,
- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

- 1 Reactions of Glucose
- 2 Reactions of Fructose
- 3 Reactions of Maltose
- 4 Reactions of Lactose
- 5 Tests for Sucrose
- 6 Tests for Starch
- 7 Identification of unknown Carbohydrates
- 8 Spotters

Spotters:

The student must identify the spotter and write some important uses of the spotter.

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenylhydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy

- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media

- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

1.Introduction to cell

- Normal Cell Structure Function

2.Cell injury and Adaptation

- Types of cell injury
- Adaptation
- Necrosis
- Apoptosis
- Pathological calcification

3.Inflammation and Repair

- Acute Inflammation
- Chronic Inflammation
- Wound Healing and Repair

4.Infectious Disease

- TB
- Leprosy

5.Hemodynamic Disorder

- Edema
- Thrombosis and Embolism
- Shock

6.Neoplasia

- Classification
- Nomenclature
- Characteristics of Benign & Malignant neoplasm
- Pathogenesis of cancer
- Spread of Cancer

7.Genetic Disorders

- Down syndrome
- Klinefelter Syndrome
- Turner Syndrome

8.Radiation

- Biological Effect of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**
 - Spotter

- **GROSS (SPOTTER)**
 - Fatty liver
 - Lipoma
 - Dry gangrene foot
 - Wet gangrene bowel
 - CVC Spleen
 - Hydatid cyst
 - TB – Lung

- **INSTRUMENTS**
 - Westergrens ESR tube
 - Sahlihemocytometer
 - Neubaur's chamber
 - Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-------------------|
| 1. | Anatomy – II |
| 2. | Physiology –II |
| 3. | Biochemistry – II |
| 4 | Microbiology – II |
| 5. | Pathology – II |
| 6. | Pharmacology |
| 7. | Physics |
| 8. | Computer science |

SEMESTER II

ANATOMY – II (UE)

Objectives:

- At the end of the course the student should be able to:
- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**

- Pituitary gland
- Pineal body
- Thyroid & parathyroid gland
- Adrenal
- Pancreas
- Gonads – Ovary & Testis

- **Cardio-Vascular System**

- Heart

- **Lymphatic system**

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Saggital section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicals
- Vas deferens
- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit III Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure & Properties of Neuron.

- Nerve- Classification,injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus , Basal ganglia , Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition,normal values,intrapulmonary and intra pleural pressures,surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis,Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenylketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA

- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles's Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout
- 21.

MICROBIOLOGY – II (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit- I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit - II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit - III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit - IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascarislumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus

14. Polio virus
15. HIV

II. Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan,Bhat,SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis

-Renal cell carcinoma(RCC)

-Renal Failure

6. REPRODUCTIVE SYSTEM

-Diseases of testis, uterus, cervix and ovary

7. CNS

-Infections

8. BONES and JOINTS

-Septic Arthritis

-Osteomyelitis

-Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy,Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids,Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting,Constipation,Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Students Discussion

Topical Preparation, Ointment, Lotion, Powder,
Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current

sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance –resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body- A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Biopotential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,
- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications in Optometry

SEMESTER III

| S.NO | SUBJECT |
|-------------|---|
| 1 | Applied Anatomy and Physiology related to Renal Dialysis Technology - Theory(UE) |
| 2 | Applied Anatomy and Physiology related to Renal Dialysis Technology - Practical(UE) |
| 3 | Applied Pharmacology related to Renal Dialysis Technology - Theory(UE) |
| 4 | Applied Pharmacology related to Renal Dialysis Technology - Practical(UE) |
| 5 | Medical Ethics and Biosafety (IE) |
| 6 | Psychology (IE) |

SEMESTER – III

APPLIED ANATOMY AND PHYSIOLOGY

RELATED TO RENAL DIALYSIS TECHNOLOGY – THEORY (UE)

Course Objective :

An Outline of Renal Anatomy and Physiology will be provided to improve the students understanding of Technical and Diagnostic procedures used with Special emphasis on Applied aspects.

Objective :

To develop the In depth knowledge on Anatomy of Renal system and Physiology of Renal system.

Contents

Unit- I

Gross structures of Excretory system :

- Structure of kidney
- Structure of Ureter and Urinary Bladder
- Structure of Nephron (Renal corpuscle, Proximal tubule, Loop of Henle, Distal tubule and Collecting tubule)
- Embryology of Kidney
- Histology of Kidney

Unit- II

Vascular supply of Excretory system :

- Renal artery & Renal vein
- Jugular vein
- Subclavian vein
- Femoral vein
- Artery & Veins used for creation of AV Fistula
- Innervations of Kidney and Urinary Bladder
- Peritoneum in general

Unit- III

Physiology related to Dialysis technology – Mechanism of Urine formation

- Filtration
- Reabsorption
- Concentration
- Dilution
- Acidification

Unit- IV

Functions of Excretory system :

- Excretory and Regulatory functions
- Metabolic and Endocrine functions
- Physiology of Micturition, Types of Bladder dysfunction
- Renal function Test

Unit- V

Regulatory functions of Excretory system :

- Role of Kidney in Blood Pressure regulation in health and diseases
- Mechanism of Blood formation and regulation
- Role of Kidney in Bone formation
- Role of Kidney in Acid – Base balance
- Other Endocrine functions of the Kidney
- Body fluids and Electrolytes & their regulation in health and diseases
- Disorders of Water Metabolism (Potassium, Sodium, Phosphate, Calcium)
- Role of Peritoneum in Peritoneal Dialysis

Recommended Books :

1. Anatomy and Physiology in Health and Illness – Ross and Wilson, 12th Edition, Elsevier Health Sciences, 2014.
2. Fundamentals of Medical Physiology - L.Prakasam Reddy, 5th Edition, Paras Medical Publishers, 2013.
3. Essentials of Medical Physiology – K.Sembulingam, Prema sembulingam, 6th Edition, Jaypee.

Reference Books :

1. Human Anatomy – B D Chaurasia, 6th Edition, CBS, 2013.
2. Text Book of Medical Physiology – Guyton and Hall, 12th Edition, Saunders, 2010.
3. The Kidney – Brenner and Rector's, 9th Edition, Elsevier Health Sciences, 2012.

Specific Learning Outcomes (SLO) :

- Will be able to explain the Anatomy of Renal system with better knowledge on terminologies.
- Will be able to explain Physiological processes with understanding.
- Will be able to provide better support during a Renal disorder with knowledge of Anatomy and Physiology.

APPLIED ANATOMY AND PHYSIOLOGY
RELATED TO RENAL DIALYSIS TECHNOLOGY – PRACTICAL (UE)

Objective :

1. To inculcate thorough knowledge on the Anatomy of various organs and structures related to Renal system.
2. To elaborate on various Physiological processes related to Renal system.

Contents

Gross Specimens / Spotters :

1. Kidney
2. Ureter
3. Urinary Bladder

Charts :

1. Renal corpuscle
2. Glomerular apparatus
3. Nephron ((Renal corpuscle, Proximal tubule, Loop of Henle, Distal tubule and Collecting tubule)
4. Renal artery & Renal vein, Jugular vein, Subclavian vein, Femoral vein, Radial artery, Cephalic vein
5. Innervations of Kidney and Urinary Bladder
6. Peritoneum in general
7. Functions of Excretory system (Excretory, Regulatory, Metabolic and Endocrine functions)
8. Physiology of Micturition, Types of Bladder dysfunction
9. Renal function Tests
10. Physiology of Micturition
11. Types of Bladder dysfunction
12. Mechanism of Urine formation
13. Role of Kidney in Blood Pressure regulation in health and diseases

14. Mechanism of Blood formation and regulation
15. Role of Kidney in Bone formation
16. Role of Kidney in Acid – Base balance
17. Other Endocrine functions of the Kidney
18. Body fluids and Electrolytes & their regulation in health and diseases
19. Disorders of Water Metabolism (Potassium, Sodium, Phosphate, Calcium)
20. Role of Peritoneum in Peritoneal Dialysis

Specific Learning Outcomes (SLO) :

- Will be able to express anatomical terminologies with clarity.
- Will be able to recognize improper physiological functions.
- Will be able to show competency in handling patients with renal disorders with knowledge on Applied Anatomy and Physiology.

APPLIED PHARMACOLOGY
RELATED TO RENAL DIALYSIS TECHNOLOGY – THEORY (UE)

Course Objective :

The Course will cover General Pharmacology with Special Emphasis on common drugs used, Route of Administration, Type of formulations, Dose and frequency of administration, Side effects and Toxicity, Management of Toxic effects, Drug interactions, Knowledge of chemical and trade names, Importance of Manufacturing and expiry dates and instruction about handling each drug.

Objective :

1. To develop understanding of various drugs and their Pharmacokinetics in relation to Renal System.
2. To introduce the Importance of Pharmacology in Dialysis Emergencies.

Contents

Unit- I

Common Drugs used in Renal Medicine :

- Diuretics
- Antihypertensives
- Antibiotics
- Steroids
- IV Fluids in Renal patient
- Iron therapy in Dialysis
- Vitamin-D analogues, Phosphate binders
- Erythropoiesis Stimulating Agents
- Chemicals used in Dialysis unit including composition and mechanism of action
- Hemodialysis Concentrates
- Peritoneal Dialysis Fluids
- Replacement Fluids used for CRRT
- Chemicals used for Sterilization including Formaldehyde, Hydrogen Peroxide, Sodium Hypochlorite, Citrosteryl, Renalin and its mechanism of action
- Vaccines used in Dialysis patients – Hepatitis B
- Immunosuppressive medications used in Renal Transplantation

Unit- II

Drugs affecting Coagulation :

- Heparin including Low Molecular Weight heparin
- Warfarin
- Protamine Sulphate
- Regional Citrate Anticoagulation

Drugs preventing Coagulation :

- Antiplatelet drugs
- Thrombolytic agents

Unit- III

Cardiovascular drugs & Inotropic Drugs :

- Digoxin
- Beta – blockers
- Dopamine
- Dobutamine
- Adrenaline
- Isoprenaline

Unit- IV

Other drugs :

- Antihistamine
- Lipid Lowering agents
- Dialysable drugs
- Bicarbonate
- Potassium
- Magnesium

Unit- V

Vasodilators :

- Nitro-glycerine
- Nitroprusside

Recommended Books :

1. Pharmacology for Dental and Allied Health Sciences - Padmaja Udaykumar, 3rd Edition, CBS, 2012.
2. Essentials of Medical Pharmacology – K D Tripathi, 7th Edition, Jaypee Brothers Medical Publishers, 2013.

Reference Books :

1. Pharmacology - Richard A. Harvey, 4th Edition, Saunders, 2009.
2. Pharmacology and Pharmacotherapeutics - R S Sataskar, 21st Edition, Popular Prakashan Ltd, 2015.

Specific Learning Outcome (SLO) :

- Will be able to explain various drug mechanisms, Route of Administration, Type of formulations, dose, Frequency of administration, side effects and toxicity.
- Will be able to recognize drug actions in their regimes in relation to Renal system conditions.
- Will be able to identify and support Physicians in diagnosis and treatment of renal disease conditions with competency.

APPLIED PHARMACOLOGY

RELATED TO RENAL DIALYSIS TECHNOLOGY – PRACTICAL (UE)

Objective :

1. To cover General Pharmacology with Special Emphasis on common drugs used, Route of Administration, Type of formulations, Dose and frequency of administration, Side effects and Toxicity, Management of Toxic effects, Drug interactions.
2. To impart knowledge of chemical and trade names, importance of manufacturing, expiry dates and instruction about handling each drug.

Contents

Spotters And Charts :

1. Diuretics
2. Antihypertensives
3. Antibiotics
4. Steroids
5. IV Fluids in Renal patient
6. Iron therapy in Dialysis
7. Vitamin-D analogues, Phosphate binders
8. Erythropoiesis Stimulating Agents
9. Chemicals used in Dialysis unit including composition and mechanism of action
10. Hemodialysis Concentrates
11. Peritoneal Dialysis Fluids
12. Replacement Fluids used for CRRT
13. Chemicals used for Sterilization including Formaldehyde, Hydrogen Peroxide, Sodium Hypochlorite, Citrosteryl, Renalin and its mechanism of action
14. Vaccines used in Dialysis patients – Hepatitis B
15. Immunosuppressive medications used in Renal Transplantation
16. Heparin including Low Molecular Weight heparin
17. Warfarin
18. Protamine Sulphate
19. Regional Citrate Anticoagulation
20. Antiplatelet drugs
21. Thrombolytic agents
22. Cardiovascular drugs (Digoxin, Betablockers, Dobutamine, Adrenaline, Isoprenaline)
23. Antihistamine
24. Lipid Lowering agents
25. Dialysable drugs
26. Bicarbonate

- 27. Potassium
- 28. Magnesium
- 29. Vasodilators (Nitro-glycerine, Nitroprusside)

Specific Learning Outcome (SLO) :

- Will be able to explain on various drug mechanisms.
- Will be able to recognize drug actions in their regimes in relation to disorders to Renal system.
- Will be able to identifying and supporting physicians in diagnosis and treatment of renal pathological conditions with competency.

MEDICAL ETHICS AND BIOSAFETY

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

PSYCHOLOGY

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests – Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, “**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

SEMESTER IV

| S.NO | SUBJECT |
|-------------|---|
| 1 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - I Theory (UE) |
| 2 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - I Practical (UE) |
| 3 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - II Theory (UE) |
| 4 | Concepts of disease and outlines of clinical evaluation related to Renal Dialysis Technology Paper - II Practical (UE) |
| 5 | Basics and Advanced Life Support - Theory (IE) |
| 6 | Medical Sociology - Theory (IE) |

SEMESTER – IV

CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RENAL DIALYSIS TECHNOLOGY - PAPER I - THEORY (UE)

Course Objective :

An outline of concepts of various Kidney Diseases will be provided to improve the students in-depth understanding of the causes, pathophysiology, diagnosis and management used with special emphasis on applied aspects and also assists in disease diagnosis, based on observed changes in tissue structure or biochemistry, while the focus of investigative pathology is the elucidation of the underlying mechanisms related to tissue injury and disease processes. The Goal of the course will be to expand and extend the student's knowledge of normal structure and function into the realm of disease processes.

Objective :

- 1.To inculcate knowledge on various pathological conditions.
- 2.To elaborate on Renal diseases and disorders and their diagnosis and therapeutic techniques.

Contents

Unit- I

Basic Renal Disorders :

- Glomerular Diseases
- Post Infectious Glomerulonephritis
- Acute Renal Failure
- Chronic Renal Failure – Chronic Kidney Disease (CKD)

Unit- II

Acid – Base, fluids and Electrolyte Disorders :

- Metabolic Acidosis, Metabolic Alkalosis & Respiratory Acidosis, Respiratory Alkalosis
- Edema and The Clinical Use Of Diuretics
- Disorders Of Sodium (Hyponatremia, Hypernatremia)
- Disorders Of Potassium Metabolism
- Disorders Of Calcium And Phosphorus Homeostasis

Unit- III

The Kidney in Systemic diseases :

- Renal function in Congestive heart failure
- Renal function in Liver diseases
- Renal involvement in Systemic vasculitis
- Renal manifestations in SLE and other Rheumatic disorders

Unit- IV

Diabetic Nephropathy :

- Epidemiology
- Pathogenesis
- Diagnosis
- Management
- Prevention

Unit- V

Renal Biopsy :

- Indications
- Contraindications
- Procedure
- Pre and Post biopsy care

Recommended Books :

1. Basic Pathology - Robbins, 9th Edition, Saunders, 2012.
2. Primer on Kidney diseases - Greenberg, 5th Edition, Elsevier Health Sciences, 2009.

Reference Books :

1. Textbook of Pathology – Harsh Mohan, 7th Edition, Jaypee Brothers Medical Publishers, 2014.
2. Kidney Diseases in Primary Care – K.Mandal and Stanley, 3rd Edition, Dorrance Publishing Co, 2008.
3. Davidson’s Principle and Practice of Medicine – Brain R Walker, 22nd Edition, Churchill Livingston, 2014.
4. ABC of Kidney Diseases – David Goldsmith, 22nd Edition, BMJ books, 2011.

Specific Learning Outcome (SLO) :

- Will be able to identify the pathological processes in relation to Renal disorders.
- Will be able to demonstrate the competency in handling patients with Renal disorders.
- Will be able to express support in diagnosing and treatment of Kidney disease patients with care.

CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RENAL DIALYSIS TECHNOLOGY - PAPER I - PRACTICAL (UE)

Objective :

- 1.To inculcate knowledge on various pathological conditions.
2. To elaborate on Renal diseases and disorders and their diagnosis and therapeutic techniques.

Contents

Specimens and Charts / Case Discussions :

1. Glomerular Diseases
2. Post Infectious Glomerulonephritis
3. Acute Renal Failure
4. Chronic Renal Failure – Chronic Kidney Disease (CKD)
5. Acid – Base, fluids and Electrolyte Disorders
6. Renal function in Congestive heart failure
7. Renal function in Liver diseases
8. Renal involvement in Systemic vasculitis
9. Renal manifestations in SLE and other Rheumatic disorders
10. Diabetic Nephropathy
11. Renal Biopsy

Urine Analysis :

1. Physical Examination
2. Chemical Examination
3. Microscopic Examination

Specific Learning Outcome (SLO) :

- Will be able to identify the pathological processes in relation to Renal sciences.
- Will be able to demonstrate the competency in handling patients with Renal disorders.
- Will be able to express support in diagnosing and treatment of Kidney disease patients with care.

CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RENAL DIALYSIS TECHNOLOGY - PAPER II - THEORY (UE)

Course Objective :

An outline of concepts of various Kidney Diseases will be provided to improve the students in-depth understanding of the causes, pathophysiology, diagnosis and management used with special emphasis on applied aspects and also assists in disease diagnosis, based on observed changes in tissue structure or biochemistry, while the focus of investigative pathology is the elucidation of the underlying mechanisms related to tissue injury and disease processes. The Goal of the course will be to expand and extend the student's knowledge of normal structure and function into the realm of disease processes.

Objective :

- 1.To inculcate knowledge on various pathological conditions.
- 2.To elaborate on Renal diseases and disorders and their diagnostic techniques.

Contents

Unit- I

The Kidney in Systemic disease :

- Amyloidosis
- Hyperoxaluria
- HUS / TTP
- Hereditary Renal disorders
- Kidney disorders in Pregnancy

Unit- II

Obstructive Renal Disorders :

- Obstructive Uropathy
- VUR and Reflux Nephropathy
- Nephrolithiasis

Unit- III

Infectious Diseases :

- Renal diseases associated with HIV infection
- Urinary Tract Infection (UTI)

Unit- IV

Drugs and The Kidney :

- Analgesics and The Kidney
- Principles of Drug therapy in Kidney failure

Unit- V

Renal Hypertension :

- Pathogenesis
- Essential HTN
- Renovascular HTN
- Therapy of HTN

Recommended Books :

1. Basic Pathology - Robbins, 9th Edition, Saunders, 2012.
2. Primer on Kidney diseases - Greenberg, 5th Edition, Elsevier Health Sciences, 2009.

Reference Books :

1. Textbook of Pathology – Harsh Mohan, 7th Edition, Jaypee Brothers Medical Publishers, 2014.
2. Kidney Diseases in Primary Care – K.Mandal and Stanley, 3rd Edition, Dorrance Publishing Co, 2008.
3. Davidson's Principle and Practice of Medicine – Brain R Walker, 22nd Edition, Churchill Livingston, 2014.
4. ABC of Kidney Diseases – David Goldsmith, 22nd Edition, BMJ books, 2011.

Specific Learning Outcome (SLO) :

- Will be able to identify the pathological processes in relation to Renal disorders.
- Will be able to demonstrate the competency in handling patients with Renal disorders.
- Will be able to express support in diagnosing and treatment of Kidney disease patients with care.

CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RENAL DIALYSIS TECHNOLOGY - PAPER II - PRACTICAL (UE)

Objective :

- 1.To inculcate knowledge on various pathological conditions.
2. To elaborate on Renal diseases and disorders and their diagnosis and therapeutic techniques.

Contents

Charts / Spotters / Specimens :

1. Amyloidosis
2. Hyperoxaluria
3. HUS / TTP
4. Hereditary Renal disorders
5. Kidney disorders in Pregnancy
6. Obstructive Uropathy
7. VUR and Reflux Nephropathy
8. Nephrolithiasis
9. Renal diseases associated with HIV infection
10. Urinary Tract Infection (UTI)
11. Drugs and The Kidney
12. Renal Hypertension

Specific Learning Outcome (SLO) :

- Will be able to identify the pathological processes in relation to Renal sciences.
- Will be able to demonstrate the competency in handling patients with Renal disorders.
- Will be able to express support in diagnosing and treatment of Kidney disease patients with care.

BASIC AND ADVANCED LIFE SUPPORT

- BLS
- TRIAGE
- Primary survey
- Secondary survey
- Airway & Ventilatory management
- Shock
- Central & peripheral venous access
- Thoracic trauma – Tension pneumothorax
- Other thoracic injuries
- Abdominal trauma – Blunt injuries
- Abdominal trauma – Penetrating injuries
- Spine and spinal cord trauma
- Head trauma
- Musculoskeletal trauma
- Electrical injuries
- Thermal burns
- Cold injury
- Pediatric trauma
- Trauma in pregnant women
- Workshop BLS
- Workshop cervical spine immobilization
- Imaging studies in trauma
- The universal algorithm for adult ECC
- Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
- Pulseless electrical activity (PEA) / asystole algorithm
- Bradycardia treatment algorithm
- Tachycardia Treatment algorithm
- Hypotension / Shock
- Acute myocardial infarction
- Pediatrics Advanced life support
- Defibrillation
- Drugs used in ACLS
- Emergency cardiac pacing
- AED

Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY

UNIT 1: NATURE AND SCOPE OF SOCIOLOGY

Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

UNIT 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

UNIT 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

UNIT 4: SOCIOLOGY OF INDIA

Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

UNIT 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist

Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system.

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
- 7.. C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications

SEMESTER V

| S.NO | SUBJECT |
|-------------|--|
| 1 | Renal Dialysis Technology - Part I - Paper I -Theory (UE) |
| 2 | Renal Dialysis Technology - Part I - Paper I - Practical (UE) |
| 3 | Renal Dialysis Technology - Part I - Paper II - Theory (UE) |
| 4 | Renal Dialysis Technology - Part I - Paper II - Practical (UE) |
| 5 | Environmental Science and Community medicine - Theory (IE) |

SEMESTER – V

RENAL DIALYSIS TECHNOLOGY PART I - PAPER I – THEORY (UE)

Objective :

- 1.To understand the Principles of Dialysis and Skills necessary to give safe and effective care during Haemodialysis treatments.
- 2.To understand Operation, Routine maintenance, Identification of Malfunction and Trouble shooting in Dialysis Equipment.

Contents

Unit- I

- Dialysis Team (Doctors, Technologist, Nurses, Technician, Renal Dietician – Rights, Responsibilities and Relationship with Patients)
- Basic chemistry of Body fluids and Electrolytes
- History of Haemodialysis
- Principles of Haemodialysis
- Indications for Dialysis
- Types of Haemodialysis

Unit- II

Water Treatment :

- Purpose of Water Treatment
- Filtration, Softener and Carbon Filtration
- Deioniser
- RO system
- Ultrafiltration

Unit- III

Haemodialysis Equipment :

- Components and Functions of HD Equipment's
- Dialyser Membranes – Types and Biocompatibility
- Types of Dialysers
- Haemodialysis Adequacy
- Anticoagulation
- Composition of Dialysate
- Dialyser Reprocessing and Reuse of Dialysers

Unit- IV

Vascular Access :

- History , Types of Access
- Access care
- Access complications & Management
- Vascular Access Recirculation

Unit- V

General Aspects :

- Infection Control and Universal Precautions
- Psychosocial Aspects of Dialysis
- Drugs and Dialysis

Recommended Books :

1. Handbook of Dialysis – J.T.Daugirdas, 5th Edition, Lippincott Williams & Wilkins, 2014.
2. Dialysis Therapy – Allen R.Nissenson, Richard N.Fine, 4th Edition, Hanley & Belfus, 2007.

Reference Books :

1. Dialysis History, Development and Promise – Tood S.Ing, 1st Edition, World Scientific Publishing Company, 2011.
2. Principles and Practice of Dialysis – William L.Henrich, 4th Edition, Lippincott Williams & Wilkins, 2009.
3. Basic Clinical Dialysis – David Harris, 1st Edition, McGraw – Hill Book Company Australia, 2008.

Specific Learning Outcome (SLO) :

- To prepare Accomplished Professionals in Dialysis Technology with a specific emphasis on Clinical Skills, Technical Knowledge that will enable Trainee to function as an independent Dialysis Professional.
- To acquire the knowledge and procedural skills necessary to deliver High Standard of Care to the Patients with Chronic Kidney Disease requiring Renal Replacement Therapy.

RENAL DIALYSIS TECHNOLOGY PART I - PAPER I – PRACTICAL (UE)

Objective :

1. To understand the Principles of Dialysis and Skills necessary to give safe and effective care during Haemodialysis treatments.
2. To understand Operation, Routine maintenance, Identification of Malfunction and Trouble shooting in Dialysis Equipment.

Contents

Charts / Slides / Spotters

1. Dialysis Team (Doctors, Technologist, Nurses, Technician, Renal Dietician – Rights, Responsibilities and Relationship with Patients)
2. Basic chemistry of Body fluids and Electrolytes
3. History, Principles and Indications of Haemodialysis
4. Types of Haemodialysis
5. Water Treatment System
6. Dialyser Membranes – Types and Biocompatibility
7. Types of Dialysers
8. Haemodialysis Adequacy
9. Anticoagulation
10. Composition of Dialysate
11. Infection Control and Universal Precautions
12. Psychosocial Aspects of Dialysis
13. Drugs and Dialysis

RENAL DIALYSIS TECHNOLOGY PART I - PAPER II – THEORY (UE)

Objective :

1. To be able to assess the patient for any complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist.
2. To respond effectively to the Physical and Emotional needs of the patient undergoing Dialysis treatment.

Contents

Unit- I

- Quality assurance in Dialysis
- High Flux and High Efficiency Dialysis
- Machine monitoring during Haemodialysis

Unit- II

- Patient Assessment & Complications – General, Pre, Intra and Post dialysis
- Lab data analysis
- Acute complications during Haemodialysis

Unit- III

- Haemodialysis in Infants and Childrens

Unit- IV

- Special procedures – Slow Continuous Therapies
- Plasmapheresis
- Hemoperfusion
- MARS

Unit- V

- Current Research in Haemodialysis

Recommended Books :

1. Handbook of Dialysis – J.T.Daugirdas, 5th Edition, Lippincott Williams & Wilkins, 2014.
2. Dialysis Therapy – Allen R.Nissenson, Richard N.Fine, 4th Edition, Hanley & Belfus, 2007.

Reference Books :

1. Dialysis History, Development and Promise – Tood S.Ing, 1st Edition, World Scientific Publishing Company, 2011.
2. Principles and Practice of Dialysis – William L.Henrich, 4th Edition, Lippincott Williams & Wilkins, 2009.
3. Basic Clinical Dialysis – David Harris, 1st Edition, McGraw – Hill Book Company Australia, 2008.

Specific Learning Outcome (SLO) :

- Able to assess and evaluate associated patient and machine complication during Dialysis.
- Able to write reports, make referrals (medical, educational) and counsel the patient.
- Able to handle different types of HD machines.
- Able to calibrate of Haemodialysis machines.

RENAL DIALYSIS TECHNOLOGY PART I - PAPER II – PRACTICAL (UE)

Objective :

1. To be able to assess the patient for any complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist.
2. To respond effectively to the Physical and Emotional needs of the patient undergoing Dialysis treatment.

Contents

Charts / Slides / Spotters / Case study :

1. Quality assurance in Dialysis
2. High Flux and High Efficiency Dialysis
3. Haemodialysis in Infants and Childrens
4. Acute complications in Haemodialysis patients
5. CRRT (Continuous Renal Replacement Therapy)
6. Plasmapheresis
7. Hemoperfusion
8. MARS
9. Nutrition management in Haemodialysis patients
10. Current Research in Haemodialysis

Specific Learning Outcome (SLO) :

- Able to assess and evaluate associated patient and machine complication during Dialysis.
- Able to write reports, make referrals (medical, educational) and counsel the patient.
- Able to handle different types of HD machines.
- Able to calibrate of Haemodialysis machines.

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

Natural Resources: Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging, and salinity, Energy Resources.

Ecosystems: Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

Pollution: Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.

Social Issues Human, Population and Environment: From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

Concept of health & disease: Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation – Natural history of disease – Iceberg phenomenon-concept of control- concept of prevention-Modes of Intervention, Changing pattern of disease.

Epidemiology: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.

Environmental & health: Definition & Components (environment sanitation environmental sanitation) Water : Safe & Wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

Air pollution & its effects. Prevention & Control of air pollution

Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

SEMESTER VI

| S.NO | SUBJECT |
|-------------|--|
| 1 | Renal Dialysis Technology – Part II – Paper I Theory (UE) |
| 2 | Renal Dialysis Technology – Part II – Paper I Practical (UE) |
| 3 | Renal Dialysis Technology – Part II – Paper II Theory (UE) |
| 4 | Renal Dialysis Technology – Part II – Paper II Practical (UE) |
| 5 | Health Care and Basic Principles - Theory (IE) |

SEMESTER – VI

RENAL DIALYSIS TECHNOLOGY PART II - PAPER I – THEORY (UE)

Objective :

1. To understand the management of patients requiring Peritoneal Dialysis and technical aspects of Dialysis related equipment.
2. To contribute to a new generation of academic dialysis professional equipped to address the challenging problems in Renal Replacement Therapy.

Contents

Unit- I

Introduction to Peritoneal Dialysis :

- History of Peritoneal Dialysis
- Physiology of PD – Kinetics of PD
- Acute Peritoneal Dialysis
- Indications and Contraindications for Chronic PD

Unit- II

PD Apparatus :

- Solutions
- Transfer set
- Connectologies
- Access for CAPD
- Catheter and Exit site care

Unit- III

PD Process & Therapies :

- Assessment of Peritoneal membrane permeability
- Adequacy of Peritoneal Dialysis
- PD Therapies – Intermittent & Continuous

Unit- IV

PD Complications & Management :

- Non-infectious complications of PD – Mechanical and Metabolic
- Infectious complications of PD
- Patient education

Unit- V

Transplantation and Current Research :

- Types of Renal Donor & Cadaver Donor maintenance
- Recipient and Donor workup for Renal Transplantation
- Principles of Post-transplant management and followup
- Current Research in PD and Transplantation

Recommended Books :

1. Handbook of Dialysis – J.T.Daugirdas, 5th Edition, Lippincott Williams & Wilkins, 2014.
2. Handbook of Kidney Transplantation – Gabriel M.Danovitch, 5th Edition, Lippincott Williams & Wilkins, 2009.

Reference Books :

1. Nolph and Gokals Textbook of Peritoneal Dialysis – Ramesh Khanna, 3rd Edition, Martinus Nijhoff Publishers, 2009.
2. Kidney transplantation – Sir Peter J.Morris, 6th Edition, Saunders, 2014.
3. Medical Complications of Kidney Transplantation – Claudio Ponticelli, 1st Edition, CRC Press, 2005.

Specific Learning Outcome (SLO) :

- Able to independently train the patients on Home Peritoneal Dialysis.
- Able to assess and evaluate the patient waiting for Renal Transplant and Donor.
- Have the skill to administer required protocols and interpret the clinical findings with reference to the patients.
- Have the skills to take part in organising Cadaver Transplant.

RENAL DIALYSIS TECHNOLOGY PART II - PAPER I – PRACTICAL (UE)

Objective :

1. To understand the management of patients requiring Peritoneal Dialysis and technical aspects of Dialysis related equipment.
2. To contribute to a new generation of academic dialysis professional equipped to address the challenging problems in Renal Replacement Therapy.

Contents

Charts / Slides / Spotters / Case study :

1. History of Peritoneal Dialysis
2. Physiology of PD – Kinetics of PD
3. Acute Peritoneal Dialysis
4. PD Solutions
5. Transfer set
6. Adequacy of Peritoneal Dialysis
7. Non-infectious complications of PD – Mechanical and Metabolic
8. Infectious complications of PD
9. Patient education
10. Types of Renal Donor & Cadaver Donor maintenance
11. Recipient and Donor workup for Renal Transplantation
12. Principles of Post-transplant management and followup

Specific Learning Outcome (SLO) :

- Able to independently train the patients on Home Peritoneal Dialysis.
- Able to assess and evaluate the patient waiting for Renal Transplant and Donor.
- Have the skill to administer required protocols and interpret the clinical findings with reference to the patients.
- Have the skills to take part in organising Cadaver Transplant.

RENAL DIALYSIS TECHNOLOGY PART II - PAPER II – THEORY (UE)

Objective :

1. To understand and apply the Principles of Dialysis and skills necessary to give safe and effective care to the individual undergoing Dialysis Therapy.
2. To assess the patient for any long term complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist.

Contents

Unit- I

Systemic diseases in Dialysis Patients :

- Nutrition in Dialysis Patients
- Diabetes in Dialysis Patients
- Hypertension in Dialysis Patients
- Serum enzyme levels
- Haematological abnormalities

Unit- II

Systemic and Infectious diseases in Dialysis Patients :

- Infections in Dialysis Patients
- Endocrine disturbances
- Bone disease
- Aluminium toxicity
- Sleep disorders

Unit- III

Special problems :

1. Musculoskeletal & Rheumatologic diseases in CRF patients
2. Special problems pertaining to Heart & Circulatory system in CRF patients
3. Special problems pertaining to Digestive tract in CRF patients
4. Special problems pertaining to Genitourinary tract and Male Reproductive organs in CRF patients
5. Special problems pertaining to Obstetrics & Gynaecology in CRF patients

6. Special problems pertaining to Nervous system in CRF patients

Unit- IV

- Common Urosurgical Procedures, instruments & their management
- ESWL

Unit- V

- Principles of ICU Care

Recommended Books :

1. Handbook of Dialysis – J.T.Daugirdas, 5th Edition, Lippincott Williams & Wilkins, 2014.
2. Dialysis Therapy – Allen R.Nissenson, Richard N.Fine, 4th Edition, Hanley & Belfus, 2007.

Reference Books :

1. Dialysis History, Development and Promise – Tood S.Ing, 1st Edition, World Scientific Publishing Company, 2011.
2. Principles and Practice of Dialysis – William L.Henrich, 4th Edition, Lippincott Williams & Wilkins, 2009.
3. Basic Clinical Dialysis – David Harris, 1st Edition, McGraw – Hill Book Company Australia, 2008.
- 4.Principles and Practice of Intensive Care monitoring – Martin J.Tobin, 1st Edition, Kluwer Academic Publishers, 1998.

Specific Learning Outcome (SLO) :

- Able to assess and evaluate associated patient and machine complication for special problems in Dialysis.
- Able to deliver the ICU care
- Overall goal of this training is to foster the trainee's development into an independent care provider in the field of Dialysis.

RENAL DIALYSIS TECHNOLOGY PART II - PAPER II – THEORY (UE)

Objective :

- 1. To understand and apply the Principles of Dialysis and skills necessary to give safe and effective care to the individual undergoing Dialysis Therapy.
- 2. To assess the patient for any long term complications with an understanding of the problem and recognize the need to report the complications to the Physician or Nephrologist.

Contents

Charts / Slides / Spotters / Case study :

1. Diabetes in Dialysis Patients
2. Hypertension in Dialysis Patients
3. Serum enzyme levels
4. Haematological abnormalities
5. Infections in Dialysis Patients
6. Endocrine disturbances
7. Bone disease
8. Aluminium toxicity
9. Nutrition management in Peritoneal Dialysis Patients
10. Introduction to the science of Nutrition
11. Definition
12. Food pattern and its relation to Health
13. Factors influencing food habits
14. Selection of Food stuffs
15. Food storage and preservation
16. Sleep disorders
17. ESWL
18. Principles of ICU care
19. PD procedure
20. PD catheter and Exit site care
21. Performance of PD exchanges manually
22. Setting up of Automated PD equipments
23. First assessment in Minor procedures
24. PET analysis
25. CPR demonstration

HEALTH CARE AND BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

2. Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

3. Health Policy and National Health Programme

- National Health Policy
- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

7. Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

8. Health Insurance

SEMESTER VII

| S.NO | SUBJECT |
|-------------|--|
| 1 | PROJECT AND DISSERTATION |
| 2 | BIostatISTICS AND RESEARCH METHODOLOGY |

SEMESTER-VII

BIO-MEDICAL STATISTICS AND RESEARCH METHODOLOGY

1. What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences.
2. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
3. Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
4. Cumulative frequency curve – Ogives – Drawing inference from graph.
5. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
6. Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
7. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.
8. Variants from the normal distribution – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
9. Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
10. Tests of significance- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -6 months



**Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY**

(Declared as Deemed to be University u/s. 3 of UGC Act, 1956)

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B.Sc. Respiratory Care Technology

Regulations, Curriculum and Syllabus

2017



Dr. M. G. R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
MADURAVOYAL, CHENNAI – 600 095

Regulations for B.Sc. (Allied Health Science) Courses

Introduction:

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the Faculty of Allied Health Sciences, is aimed at training students who will be able to meticulously assist the doctors for providing quality patient care in selected areas of clinical specialty. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

1. Short Title and Commencement:

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of Dr. M.G.R Educational and Research Institute. These regulations shall come into force from the academic year 2017-2018. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

2. Eligibility for Admission:

- a) A candidate desiring to join the (3-year course work + 1-year internship) program, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
 - i) Physics, Chemistry, Biology
 - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. Age limit for admission

A candidate should have completed the age of 17 years or would complete the age as on 31st December of the year of admission to the BSc .Allied Health Science Course.

4. Eligibility Certificate

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate from Dr. M.G.R Educational and Research Institute and produce the same at the time of admission.

5. Registration

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

6. Duration of the course

The duration of the B.Sc. (Allied Health Science) Degree Course shall be 3-year course work comprising of 6(six) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

7. Commencement of the Course:

The course shall ordinarily commence by the month of August of the academic year.

8. Curriculum:

The Curriculum and syllabus for the course shall be as specified in the annexure to these regulations which are subject to modifications by the standing Academic Board from time to time.

(i) The first three years of the course will be utilized as follows:

- The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Physics , English and Communication skills, Introduction to Computers, and Pharmacology.
- At the beginning of the third semester, students will be assigned to one of the following branches of specialization as per the admission policy, and they will be offered specialized training in that specialty during the third, fourth, fifth and sixth semesters.

(ii) The fourth year of the course shall be compulsory internship in the respective specialty.

9. Medium of Instruction:

English shall be the medium of instruction for all the subjects of study and for the examination.

10. Working Days:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above in the first to Sixth Semesters. In the Seventh and Eighth semesters, each semester shall have a minimum of 120 working days.

11. Attendance:

The candidate shall have not less than 80 % attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., February and August.

14. Continuous (Internal) Assessment:

Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

Continuous (Internal) Assessment for Practical shall be the average of the best two out of three.

15. Semester - End Examination (University/Department):

- a. The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical examinations. The Semester - End Examination (University/Department) shall be conducted at the end of each semester.
- b. Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the date of Semester - End Examinations (Internal examinations) shall be as per the University guidelines.

16. Pattern of Semester - End Examination (University/Department):

EXAMINATION PATTERN

Semester-I and Semester-II (FOR ALL SPECIALITIES)

THEORY

MAX.MARKS- 60 Marks

DURATION -2¹/₂ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

- (i) Theory 20 Marks
- (ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern

80 marks

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

20 marks

- Based on CAT Exams

TOTAL

100 Marks

Practicals Pattern

Max marks:80

| | |
|------------------------------|----------|
| 1. Spotters | 20 marks |
| 2. Viva (Theory &Practicals) | 20 marks |
| 3. Charts/stations | 20 marks |
| 4. Record | 20 marks |

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL

100 Marks

17. Marks Qualifying for a Pass:

For passing the University/End-Semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- 40% minimum in the University End-Semester Theory examination
- 40% minimum in the University End-Semester Practical examination
- 40% of marks in the subject where internal evaluation alone is conducted
- 40% of aggregate of theory, practical and internal assessment taken together

18. Classification of successful candidates:

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19.Revaluation of answer papers

There shall be revaluation and retotaling of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University within fifteen days of publication of the results for revaluation and retotaling.

20. Carry- over of failed subjects

- 1) A candidate has to pass in theory and practical examinations separately in each of the paper.
- 2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)
- 3) The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

21. Temporary break of study

- a) A candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for four or more weeks,
 - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
 - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.
- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
 - i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.

- ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER – I

TOTAL HOURS : 330

| S.No. | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|-------|-----------------|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -I | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | English | 30 hours | - | 50 | 15 | 20 | 05 | 50 |

SEMESTER – II

TOTAL HOURS : 420

| S.No. | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|-------|------------------|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Anatomy -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 2 | Physiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 3 | Biochemistry -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 4 | Microbiology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 5 | Pathology -II | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 6 | Pharmacology | 40 hours | 20 hours | 20 | 5 | 60 | 15 | 100 |
| 7 | Physics | 30 hours | - | 50 | - | - | - | 50 |
| 8 | Computer Science | 30 hours | - | 50 | - | - | - | 50 |

SEMESTER – III (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 420

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Applied Anatomy, Physiology related to Respiratory care technology-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Applied Anatomy, Physiology related to Respiratory care technology-Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Pharmacology related to Respiratory care technology-Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Pharmacology related to Respiratory care technology-Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Medical Ethics and Bio safety (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Psychology(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – IV (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 420

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|---|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- Theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- theory (UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- practical (UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Basics and advanced life support (IE) | 30 hours | - | - | - | 50 | - | 50 |
| 6 | Medical sociology (IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – V (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 390

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | |
|------|--|------------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Respiratory care technology Part I – Paper I – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Respiratory care technology Part I – Paper I – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Respiratory care technology Part I – Paper II – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Respiratory care technology Part I – Paper II – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Environmental science and Community medicine – Theory(IE) | 30 hours | - | - | - | 50 | - | 50 |

SEMESTER – VI (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS: 390

| S.No | Paper | Hours/ Semester | | Evaluation (Marks) | | | | |
|------|--|-----------------|-----------|-----------------------------------|-----------|--|-----------|-------|
| | | Theory | Practical | Continuous Assessment (Internals) | | End Semester examination (University/Department Exams) | | Total |
| | | | | Theory | Practical | Theory | Practical | |
| 1 | Respiratory care technology Part II - Paper- I – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 2 | Respiratory care technology Part II - Paper- I – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 3 | Respiratory care technology Part II - Paper- II – Theory(UE) | 60 hours | - | 20 | - | 80 | - | 100 |
| 4 | Respiratory care technology Part II - Paper- II – Practical(UE) | - | 120 hours | - | 20 | - | 80 | 100 |
| 5 | Healthcare and basic principles(IE) | 30 hours | - | | - | 50 | - | 50 |

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

| S.No | Paper | Hours / Semester | | Evaluation (Marks) | | | | Total |
|------|---|------------------|-----------|-----------------------------------|------|--------------------------|------|-------|
| | | Theory | Practical | Continuous assessment (Internals) | | End Semester Examination | | |
| | | | | Project | Viva | Project | Viva | |
| | | | | | | | | |
| 1. | Project/ Dissertation(UE) | - | - | 100 | - | 100 | - | 200 |
| 2. | Bio-Statistics and research methodology(IE) | 30 hours | - | - | - | Theory | | 50 |
| | | | | | | 50 | | |

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

SEMESTER - I

| | Subject |
|--|----------------------|
| | Anatomy – I (UE) |
| | Physiology –I (UE) |
| | Biochemistry - I(UE) |
| | Microbiology - I(UE) |
| | Pathology – I(UE) |
| | English (IE) |

SEMESTER - I

ANATOMY – I (UE)

Objectives:

At the end of the course the student should be able to:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Learning Objectives: Skills

- Identify the anatomical structure in the dissected specimen.
- Learn to correlate anatomical structures with relevant clinical conditions.

CONTENTS

Unit I

Organization of the Human Body

- Introduction to the human body
- Definition and subdivisions of anatomy
- Anatomical position and terminology
- Regions and Systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

Cell

- Definition of a cell, shapes and sizes of cells
- Parts of a cell – cell membranes cytoplasm, sub cellular organelles and their main function
- Cell Division – Definition and main events that occur in different stages of mitosis and meiosis.

Tissues

- Tissues of the body
- Definition and types of basic tissues
- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

- Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body.
- Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.

2. Muscular system

- Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachial, Triceps brachia, gluteus, gastrocnemius and diaphragm.

Unit III

Control Systems of the Body

1. Nervous system

- Sub-divisions of the nervous system
- **Spinal cord** – Location, extent, spinal segments, external features and internal structure.
- **Brain** – Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.
- **Cranial nerves** - Name, number, location and general distribution.
- **Spinal nerves** - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.
- **Autonomic Nervous system** –definition and functions

2. Sense organs

- Location and features of the nose, tongue, eye, ear and skin

3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

PRACTICAL & VIVA VOCE

1. Histology – Epithelium

2. Axial & Appendicular Skeleton With Names & Number Of Bones

3. Muscles

- a. Trapezius
- b. Lattissimus dorsi
- c. Biceps
- d. Triceps
- e. Deltoid

4. Nervous System

- a. Cerebrum
- b. Cerebellum
- c. Brain Stem
- d. Spinal Cord

5. Special Senses

- a. Tongue
- b. Ear
- c. Skin
- d. Eye

6. Viva Voce

- a. Radiology – X rays
- b. Osteology
- c. Charts
- d. Models
- e. Gluteus Muscles

Recommended books:

- 1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha
- 2. B D Chaurasia: General human anatomy

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III
2. Richard S. Snell: Clinical Anatomy

PHYSIOLOGY-I

Objectives of the course:

At the end of this course the students should be able to:

- Comprehend basic terminologies used in the field of Human Physiology
- Define and describe basic Physiological processes governing the normal functioning of the human body.
- Apply this knowledge in their Allied Health Science practice.

CONTENTS

Unit 1

General Physiology

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

Nerve and muscle

- Nerve structure, classification of nerve fibers,
- Muscles- classification , structure , Neuro-Muscular junction(NMJ).
- Muscle contraction-mechanism, types.

Blood and body fluids

- Body fluid volumes, compartments, and composition
- Blood composition and functions
- Plasma proteins
- Erythrocytes –Morphology and functions
- Leucocytes-Morphology and functions
- Platelets-Morphology and functions
- Blood groups.

Unit II

Digestive system

- Salivary glands -Nerve supply, functions of saliva.
- Gastric juice-composition & functions of gastric juice.
- Pancreatic juice- composition, functions and regulation of pancreatic juice.
- Bile- composition, functions of bile and bile salts.
- Succus entericus and small intestinal movements.
- Deglutition, vomiting, functions of large intestine.

Excretory system

- Structure of Nephron and its blood supply, Juxtaglomerular Apparatus(JGA).
- Formation of urine-Filtration, Reabsorption and secretion.
- Counter-Current mechanism
- Micturition.

PRACTICAL & VIVA VOCE

- Microscope
- Estimation of Hemoglobin
- RBC
- WBC
- Spotters

BIOCHEMISTRY-I (UE)

Objectives:

At the end of this course the students should be able to:

- To have a knowledge about the chemistry and metabolism of various macromolecules- carbohydrate, protein and lipids
- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

- Classification of carbohydrates and their biological importance,
- Reducing property of sugars.

Metabolism of Carbohydrates :

- Digestion and Absorption of carbohydrates,
- Steps of Glycolysis and energetics,
- Steps of TCA cycle and energetics,
- Steps of Glycogen synthesis and breakdown,
- Significance of HMP shunt pathway,
- Definition and steps of Gluconeogenesis, Galactose metabolism
- Galactosemia.
- Diabetes mellitus ,

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

- Classification of lipids,
- Essential fatty acids,
- Functions of cholesterol,

- Triglycerides,
- Phospholipids

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,
- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

- Vitamins, its classification
- Vitamin A
- Vitamin D
- Vitamin E & K
- Vitamin B complex
- Vitamin C

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

1. Reactions of Glucose
 2. Reactions of Fructose
 3. Reactions of Maltose
 4. Reactions of Lactose
 5. Tests for Sucrose
 6. Tests for Starch
 7. Identification of unknown Carbohydrates
-
8. Spotters

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

- Benedict's reagent
- Barfoeds reagent
- Foulgers reagent
- Seliwanoff reagent
- Fouchets reagent

- **CHEMICALS**

- Sodium Acetate
- Phenyl hydrazine
- α Naphthol

- **STRUCTURES.**

- Structure of Cholesterol
- Structure of Glucose
- Structure of Fructose

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Contents

Unit I:

General Microbiology-History and Introduction of Microbiology, Microscopy and Morphology of bacterial cell and their function, Growth and nutrition of Bacteria, Sterilization and Disinfection , Culture media, Culture methods and Identification of bacteria.

Unit II:

Immunology-Basic concept about Infection (Source, Portal of entry and Spread), Immunity, Antigen, Antibody, Antigen-Antibody reaction, Hypersensitivity.

Unit III

Systemic bacteriology- Disease caused and lab diagnosis of medically important bacteria (Staphylococcus, Streptococcus, Neisseria, Echerichia coli, Salmonella, Shigella, Vibrio, Mycobacteria, Spirochetes)

PRACTICAL & VIVA VOCE

1. Gram staining

2. Spotters:

- Disposable syringe
- Sterile cotton swab
- Bacteriological loop
- Sterile tube
- McIntosh fildes Jar
- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

PATHOLOGY-I (UE)

Objective:

At the end of the semester the students should be able to

- To develop better understanding of pathological conditions and their causes.
- To develop knowledge on the diseases of major organs and structures.

Contents

Unit-I. Introduction to cell

- Normal Cell Structure Function

Unit-II. Cell injury and Adaptation

- Causes and Types of Cell Injury
- Cellular Adaptations- (Hypertrophy, Hyperplasia, Atrophy, Metaplasia)
- Necrosis-Definition, Causes, Types with Examples, Morphology
- Apoptosis-Definition, Causes, Morphology
- Pathological Calcification

Unit-III. Inflammation and Repair

- Inflammation-Definition, Types, Cardinal signs
- Acute Inflammation-Vascular events and Cellular events(ONLY NAMES) , Outcomes of Acute inflammation, Morphological types of Acute inflammation(ONLY NAMES), Chemical Mediators(ONLY NAMES)
- Chronic Inflammation- Causes and Granulomatous inflammation
- Wound Healing and Repair- Definition, Steps in wound healing, Factor influencing wound healing, Complications of wound healing(ONLY NAMES)

Unit-IV. Hemodynamic Disorder

- Edema- Definition, Causes and Pathogenesis
- Thrombosis-Definition, Causes and Fate of thrombus
- Embolism-Definition and Types
- Infarction-Definition and Classification
- Shock-Definition, Stages, Types of Shock, Etiopathogenesis of Septic shock

Unit-V.Infectious Disease

- Tuberculosis-Etiology, predisposing factors, primary & secondary tuberculosis and complications
- Leprosy-Etiology, classification, Lepromatous and tuberculoid leprosy

Unit-VI.Neoplasia

- Definition, Nomenclature & Classification
- Characteristics of Benign and Malignant neoplasms,
- Pathogenesis of Cancer(Only Names of Carcinogenic agents)
- Spread of Cancer(Metastasis and Pathways of spread)

Unit-VII.Genetics

- Down syndrome
- Klinefelter syndrome
- Turner syndrome

Unit-VIII. Radiation

- Effects of Radiation

PRACTICAL & VIVA VOCE

• DIFFERENTIAL COUNT

- Spotter

• GROSS (SPOTTER)

- Fatty liver
- Lipoma
- Dry gangrene foot
- Wet gangrene bowel
- CVC Spleen
- Hydatid cyst
- TB – Lung

• INSTRUMENTS

- Westergrens ESR tube
- Sahli hemocytometer

- Neaubaur's chamber
- Bone Marrow Needle

SEMESTER-II

| S.No: | Subject |
|--------------|-----------------------|
| 1. | Anatomy – II (UE) |
| 2. | Physiology –II (UE) |
| 3. | Biochemistry – II(UE) |
| 4 | Microbiology – II(UE) |
| 5. | Pathology – II(UE) |
| 6. | Pharmacology(UE) |
| 7. | Physics(IE) |
| 8. | Computer science (IE) |

SEMESTER II

ANATOMY – II (UE)

Objectives:

At the end of the course the student should be able to:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be “human”.

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

- Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart.
- Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. Lymphatic system

- Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. Respiratory system

- Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit II

4. Digestive system

- Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

5. Urinary system

- Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.

Unit III

6. Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

PRACTICAL & VIVA VOCE SYLLABUS

• Endocrine System

- Pituitary gland
- Pineal body
- Thyroid & parathyroid gland
- Adrenal
- Pancreas
- Gonads – Ovary & Testis

• Cardio-Vascular System

- Heart

• Lymphatic system

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

- **Digestive System**

- Salivary glands
- Esophagus
- Pharynx
- Stomach
- Liver, Gall bladder
- Duodenum
- Small intestine
- Large intestine

- **Urinary system**

- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

- Sagittal section – Male & Female pelvis
- Uterus & ligaments
- Ovary
- Prostate
- Seminal vesicles
- Vas deferens
- Testis

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

1. Manipal manual of Anatomy for Allied Health Sciences, Sampathmadhyastha.
2. B D Chaurasia: General human anatomy.

References:

1. B D Chaurasia: Regional Anatomy. Vol I, II,III.
2. Richard S. Snell: Clinical Anatomy.

PHYSIOLOGY-II (UE)

Unit I Cardiovascular System

- Cardiac muscle, action potential and conducting system of the heart.
- Cardiac cycle.
- ECG, heart sounds, Heart Rate.
- Cardiac output-Definition ,factors regulating cardiac output and measurement of cardiac output.
- Blood pressure-Definition, measurement, factors maintaining BP.
- Regional circulation-Coronary and cerebral.

Unit -IV Nervous system

- Structure& Properties of Neuron.
- Nerve- Classification, injury.
- Types and properties of Receptors
- Synapse and synaptic transmission.
- Reflex and its properties.
- Spinal cord-Ascending & Descending tracts.
- Thalamus , Basal ganglia , Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid.
- Autonomic nervous system.
- Ascending and descending tracts.

Unit -V Respiratory system

- Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration.
- Lung volumes and capacities-definition ,normal values, intrapulmonary and intra pleural pressures, surfactant.
- Oxygen transport,carbon-dioxide transport.
- Neural and chemical regulation of respiration.
- Hypoxia ,cyanosis, Artificial Respiration.

Unit – VI Special sense and skin

- Vision,
- Audition,
- Olfaction,
- Gustation.

Unit – VII Reproductive system

- Male reproductive organs-Spermatogenesis and testosterone actions.
- Female reproductive organs.
- Contraception Methods.

Unit – VIII Endocrine system

- Hypothalamus hypophyseal inter relationship.
- Anterior pituitary hormones and their functions.
- Posterior pituitary hormones and their actions.
- Thyroid hormones, biosynthesis and functions.
- Parathyroid hormones ,functions.
- Insulin, glucagons, actions and Diabetes mellitus.
- Adrenal cortex hormones and their functions.
- Adrenal medullary hormones and their actions.

PRACTICAL & VIVA VOCE SYLLABUS

1. WBC.
2. Blood pressure.
3. Bleeding time
4. Clotting time.
5. Charts and spotters.

BIOCHEMISTRY – II (UE)

Objectives:

At the end of the semester the students should be able

- To have a knowledge about the chemistry and metabolism of proteins
- To learn about nutrition-balanced diet and malnutrition
- To know the structure and function of Hemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit I - PROTEINS

Proteins :

- Classification of amino acids,
- Structure of proteins,
- Plasma proteins,
- Immunoglobulins.

Metabolism of Proteins :

- Digestion and absorption of proteins,
- Transamination,
- Deamination,
- Steps of urea cycle,
- Phenyl ketonuria,
- Alkaptonuria,
- Transmethylation,
- Products derived from Glycine and tyrosine

Unit II -- NUCLEIC ACIDS

Nucleic acids:

- Structure & Function of DNA,
- Structure, Its types & Functions of RNA
- Nucleic Acid Metabolism

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

- BMR, SDA & Glycemic Index
- Dietary Fibers & Balanced Diet
- Protein Energy Malnutrition

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

Spotters: The student must identify the spotter and write some important uses of the spotter.

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles' Tube
8. Chromatography apparatus
9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

OBJECTIVE:

At the end of the semester the students should be able to

- Know the concepts of sterilization and disinfection procedures and their applications.
- Understand the basic principles of immunology.
- Understand the basic fundamental aspect of bacteria and study the common disease caused by them.

Unit-

I

Virology: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections

Unit

- II

Mycology: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.

Unit

- III

Parasitology: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris, Ancylostoma) and Lab diagnosis of parasitic infections

Unit

- IV

Applied Microbiology-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida
4. Universal container
5. Vaccine-OPV
6. BCG
7. Hepatitis
8. DPT
9. TT
10. MMR
11. Virology –Embryonated egg
12. Tissue culture
13. Rhabdovirus
14. Polio virus
15. HIV

II.Clinical case discussion with charts

1. Skin and soft tissue infections
2. Ring worm/ Tinea infections
3. Food poisoning
4. Gastroenteritis

RECOMMENDED BOOK:

1. Dr.C.P.Baveja- Microbiology in Nutshell (Arya Publications).

REFERENCE BOOKS:

1. Ananthanaryanan and Paniker's - Textbook of Microbiology.
2. Dr.C.P.Baveja – Textbook of Microbiology.

PRACTICAL BOOK:

1. Patwardhan, Bhat, SatishPatwardhan – Handbook of Practical examination in Microbiology.

PATHOLOGY- II (UE)

1. CVS

- Atherosclerosis
- Ischemic heart disease
- Congenital heart disease
- Valvular heart disease

2. RESPIRATORY SYSTEM

- Bronchial Asthma
- Emphysema
- Bronchiectasis

3. GIT

- Gastric ulcer
- Tumors of GIT

4. HEPATOBILIARY

- Hepatitis
- Liver Abscess
- Cirrhosis
- Cholecystitis

5. KIDNEY AND URINARY TRACT

- Renal stones
- UTI and Pyelonephritis
- Renal cell carcinoma(RCC)
- Renal Failure

6. REPRODUCTIVE SYSTEM

- Diseases of testis, uterus, cervix and ovary

7. CNS

- Infections

8. BONES and JOINTS

- Septic Arthritis
- Osteomyelitis

-Rheumatoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

- RBC Pipette
- WBC Pipette
- Sahli's Pipette
- Wintrobe's PCV tube
- Hb Estimation
- Blood grouping

SPECIMEN

- Chronic Pyelonephritis
- RCC
- SCC – Foot
- Leiomyoma – Fibroid uterus
- Gall stones
- Appendicitis
- Liver abscess

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamic involved in the use of drugs.

To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.

To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-

Unit I:

- Pharmacodynamics-Adverse drug effects
- Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

Unit II

- General considerations-Cholinergic system & drugs-Anticholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Unit III:

- Skeletal muscle relaxants-Local anaesthetics,General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs

Unit IV

- Cardiovascular drugs , Drugs affecting Blood & Blood formation and Drugs on Respiratory system
- Cardiac glycosides,Antiarrhythmic drugs, Antianginal drugs,Antihypertensives and Diuretics,Haematinics,Erythropoietin,,Drugs affecting-coagulation,Fibrinolytic and Antiplatelet drugs,Treatment of cough and antiasthmatic drugs.

Unit V

- Antimicrobial drugs
- General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Cancer Chemotherapy, Antiseptic-Disinfectant-others.

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs
- Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition

Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3rd edition

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

Basic and Clinical Pharmacology by Bertram G Katzung, 12th edition

PRACTICAL & VIVA VOCE

Learning Objective

This module is intended to discuss the various modalities of drug delivery and instruments relevant to it.

Instruments

Needles

Intravenous

Intrathecal

Spinal

Intra arterial

Students Discussion

Syringes: Tuberculin

Insulin

I.V cannula

Scalp. Vein set

Students Discussion

Enema can

Inhalers

Spacers

Nebulizers

Students Discussion

Tablets – Enteric coated, Sustained release, Sub-lingual

Students Discussion

Capsules, Spansules, Pessary, Suppository

Topical Preparation, Ointment, Lotion, Powder,
ear

Drops – eye /

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

- Text book of pharmacology for Dental & Allied Health Science 2nd edition Padmaja Udaykumar
- Pharmacology for dental students Tara V shanbhag, Smita Shenoy, Veena Nayak
- Principles of pharmacology 2nd edition H.L.Sharma & KK Sharma

PHYSICS (IE)

Unit 1: Basic concepts

Basic Units, Heat, Acoustics etc. Basic concepts of power, work, force, energy Einstein's formula Electronics, Electricity & Magnetism, electromagnetic waves Units and measurements temperature and heat SI units of above parameters Atomic structure Nucleus Atomic Number, Mass Number electron orbit and energy levels Periodic table Isotopes Isobars Ionization and excitation Radioactivity, Natural and artificial radioactivity alpha decay beta decay.

Unit 2: Electromagnetic induction

Electric charges electric induction electric potential capacitance and capacitors. Electrical energy and power unit of current resistance and Ohm's law circuit laws heating effect of current sources of electrical energy E.M.F. Magnetism, Magnetic effect of an electric current application of magnetic field. Electromagnetic induction, laws of mutual induction and self-induction. Alternating current transformers theory and losses practical aspects reactance – resonance impedance and power factors.

Unit 3: Laser

Nature of light-Reflection-Refraction-Total internal reflection- Optical fibers- Applications in Medicine - Laser-Principles-Action-Types of laser, Basic principles of laser in Medical application - Argon-Iron laser photo coagulator-Photo thermal-Photochemical application - Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

Introduction to nuclear physics and radioactivity, Radioactive radiations - X-ray, production of x-ray, Properties of x-ray radiations - Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement - Ultrasound and generation of ultrasound.

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography: Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -^{99m}Tc Generator- Scintillation detectors - Application of scintillation detectors - Gamma Camera - Positron Camera.

Unit 6: Semiconductor devices

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers– Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

Unit 7: Biopotential Recording Systems

Introduction to bioelectric potential – Electrodes and surfaces – Biopotential amplifier – Frequency ranges of various Bio potential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Computer Science (IE)

1. History of computers,

- Definition of computers,
- Input devices,
- Output devices,
- Storage devices,
- Types of memory,
- And units of measurement,
- Range of computers,
- Generations of computers,

- Characteristics of computers

2. System:

- Hardware,
- Software,
- system definition,
- Fundamentals of Networking,
- Internet,
- Performing searches and working with search engines,
- types of software and its applications

3. Office application suite –

- Word processor,
- spreadsheet,
- presentations,
- other utility tools,
- Fundamentals of Linux / Windows operating system, functions, interfaces, basic commands, working with the shell and other standard utilities.

4. Language

- Comparison chart of conventional language,
- programming languages,
- generations of programming languages,
- Compilers and interpreters,
- Universal programming constructs based on SDLC,
- Variable, constant, identifiers, functions, procedures, if while, do – while,
- For and other Structures.

5. Programming in C language,

- Data types, identifiers, functions and its types, arrays, union, structures and pointers
- Introduction to object oriented programming with C++: classes, objects, inheritance
- Polymorphism and encapsulation. Introduction to databases, and query languages,
- Introduction to Bioinformatics

Practicals:

1. Various browsers, search engines, email
2. Text document with images with multiple formatting options using a specified office package
3. Spreadsheet using a specified office package
4. Presentation on a specified topic using the specified locations
5. Shell programming-parameters
6. Shell program- regular expressions
7. C program- functions
8. C program – file handling
9. C program demonstrating the usage of user defined variables
10. Databases
11. Applications

| S.NO | SUBJECT |
|-------------|--|
| 1 | Applied Anatomy, Physiology related to Respiratory care technology-Theory(UE) |
| 2 | Applied Anatomy, Physiology related to Respiratory care technology-Practical(UE) |
| 3 | Pharmacology related to Respiratory care technology-Theory(UE) |
| 4 | Pharmacology related to Respiratory care technology-Practical(UE) |
| 5 | Medical Ethics and Bio safety (IE) |
| 6 | Psychology(IE) |

SEMESTER III

APPLIED ANATOMY AND PHYSIOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY-THEORY(UE)

COURSE DESCRIPTION:

- This course will provide an outline of anatomy and physiology to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- To develop in depth knowledge on anatomy of various organs and structures in relation to Respiratory system and cardiovascular system.
- To develop exhaustive idealogy of various physiological processes in relation to Respiratory system and cardiovascular system.

LEARNING OBJECTIVE SKILLS:

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain physiological processes with understanding of respiratory and cardiovascular system.
- Will be able to show competency in handling patients suffering from respiratory illness with knowledge on applied anatomy and physiology.

UNIT-I: ANATOMY OF RESPIRATORY SYSTEM

- Structure of respiratory system. Functional Anatomy of the pulmonary system. The upper airway the nose, pharynx, larynx.
- The tracheobronchial tree histology, the trachea, mainstem bronchi, lobar bronchi, segmental bronchi, bronchioles, terminal bronchioles.
- The mucous blanket, mucus, cilia function, lung parenchyma, alveolar epithelium, the alveolar macrophage, surfactants.
- Respiratory muscles of the thorax, muscles of ventilation, the neurochemical control of ventilation.

UNIT-II: PHYSIOLOGYPULMONARY MECHANICS

- The lung thorax relationship
- Physics of ventilation, the principle of elastance, the principle of compliance, the principle of airway resistance.
- Pulmonary function studies lung volumes and capacities FRC, VC (expiratory spirogram)
- Screening pulmonary function testing
- The work of breathing definition, essential clinical factors, ventilator reserve.

UNIT-III: PHYSIOLOGY OF EXTERNAL RESPIRATION

- The systemic capillary blood
- The v/q relationship
- Distribution of pulmonary perfusion gravity, cardiac output
- Regional differences in respiration
- Shunting and dead space
- The concepts of physiologic shunt, anatomic shunt, capillary shunt, shunt effect.

UNIT-IV: ANATOMY OF CARDIO VASCULAR SYSTEM

- Anatomy of heart and great blood vessels
- Gross anatomy and structural features
- Gross anatomy of cardiac chambers
- Atrium
- Ventricles
- A V junction
- Heart valves
- Specialized conduction system
- Sinus nodes
- AV node

UNIT-V: CARDIO VASCULAR SYSTEM

- Defining circulation
- Myocardial mechanics
- Myocardial contractility
- Ventricular preload
- Ventricular after load
- Distribution of total body water
- Absolute hypovolemia
- Absolute hypervolemia
- Relative hypovolemia
- Venous return
- Venous driving pressure
- Distribution of circulation

- Assessment of perfusion

UNIT-VI: CLINICAL ASSESSMENT OF CIRCULATION

- Cardiac output measurements
- Thermal dilution technique
- Atrial pressure measurement
- Central Venous Pressure
- Pulmonary Artery Catheter
- Positive inotropic agents
- Diuretic therapy
- After load reduction

UNIT-VII: ASSESSMENT OF THE INTRAPULMONARY SHUNT

- The concept of intrapulmonary shunting
- True shunt mechanism
- Anatomic shunting pathology
- Capillary shunting pathology
- The true shunt equation
- The Fick's equation
- Cardiac output
- Pulmonary capillary oxygen content
- The classic physiologic shunt equation
- Oxygen consumption
- Arterial-Mixed venous Oxygen content difference
- Hypokalemia and intrapulmonary shunting
- Guidelines of interpreting the shunt calculation

UNIT-VIII: ASSESSMENT OF CARDIOPULMONARY RESERVES

- Ventilator muscles fatigue
- Increased muscle demand
- Decreased energy demand
- Decreased energy supply
- Diagnosis

- The ventilator pattern
- Paradoxical breathing
- Vital capacity (VC)
- Negative inspiratory pressure
- Forced expiratory volume (FEV)
- Cardiovascular reserve
- Heart rate and rhythm
- Blood pressure
- Perfusion
- Gas exchange : Respiration
- Alveolar ventilation
- Dead space ventilation
- Arterial pH
- Oxygenation

RECOMMENDED BOOKS:

ANATOMY:

1. Manipal manual for Allied Health Science, sampathmadhyastha.
2. Textbook of human anatomy - B D Chaurasias

PHYSIOLOGY:

1. Basics of medical physiology, D. Venkatesh, H.H. Sudhakar
2. Guyton and Hall Textbook of medical physiology, John E. Hall
3. Essentials of medical physiology, K. Sembulingam, PremaSembulingam

REFERENCE BOOKS:

1. Manipal manual for Allied Health Science, sampathmadhyastha.
2. Textbook of human anatomy - B D Chaurasias
3. Ganong's medical physiology-kimE.Barrett, 24th edition, Medical Publishers, 2012
4. Egan's Fundamentals of Respiratory Care-Robert M. Kacmarek, 10th edition, Elsevier/Mosby Inc, 2013
5. Anatomy and physiology in health and illness – Ross &Willson, 12th edition, Elsevier health sciences, 2014.

2. APPLIED ANATOMY, PHYSIOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY-PRACTICAL(UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To inculcate through knowledge on the anatomy of various organs and structures involved in respiratory and cardiovascular systems.
- To elaborate on various physiological processes in relation with respiratory care technology.

LEARNING OBJECTIVE SKILLS:

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain physiological processes with understanding of respiratory and cardiovascular system.
- Will be able to show competency in handling patients suffering from respiratory illness with knowledge on applied anatomy and physiology.

1. MODEL

- Trachea
- Bronchi
- Lungs

2. CHARTS

- Dead space
- Dyspnoeic index
- Breathing reserve
- Ventilation/perfusion ratio
- Cardiac output
- Alveolar ventilation

- Oxygen carrying capacity
- Vital capacity

3.SPOTTERS

- Pulse oximeter
- Stethoscope
- BP apparatus
- Peak flow meter

3. PHARMACOLOGY RELATED TO RESPIRATORY CARE

TECHNOLOGY–THEORY(UE)

COURSE DESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- At the end of the course the students should be able to:
- To develop understanding of various drugs and their pharmacokinetics in relation to respiratory care.
- To introduce the importance of drug and their adverse effects.

LEARNING OBJECTIVE SKILLS:

- Will be able to explain various drugs and their pharmacokinetics.
- Will be able to recognize developments in treatment with specific drugs during a respiratory illness.
- Will be able to identify and work in close competency with specific drugs treatment and diagnosis.

UNIT-I: RECEPTOR SITE THEORY

- Adrenergic receptor site
- Alpha receptors
- Beta 1 receptors
- Beta 2 receptors

- Cholinergic receptors
- Mechanism of bronchospasm
- Mast cell degranulation
- Slow reacting substance of anaphylaxis
- Prostaglandin
- Acetylcholine

UNIT-II: SYMPATHOMIMETIC DRUGS

- Adrenaline
- Salbutamol, Terbutaline, Salmeterol, Fomoterol
- Short acting and long acting beta 2 agonists

UNIT-III: PHOSPHODIESTERASE INHIBITORS

- Aminophylline
- Theophylline
- Doxophylline

UNIT-IV: ANTICHOLENERGIC DRUGS

- Atropine sulphate (Atropine)
- Ipratropium bromide
- Tiotropium bromide

UNIT-V: CORTICOSTEROIDS IN RESPIRATORY CARE

- Hydrocortisone
- Prednisone
- Dexamethasone
- Triamcinolone
- Beclamethasone
- Solumedrol

UNIT-VI: MUCOKINETIC AGENTS

- Acetylcysteine
- Sodium bicarbonate
- Bromhexine

UNIT-VII: USE OF BLAND AEROSOLS IN RESPIRATORY CARE

- Distilled water
- Saline solution
- Propylene glycol

UNIT-VIII: AEROSOLIZED ANTI MICROBIAL AGENTS

- Antibiotics – Gentamycin, Amoxicillin
- Antiviral agents - Ribavirin
- Antiprotozoal agent –Pentamidine

UNIT-IX: ANTI TUBERCULOUS DRUGS

- 1st Line drugs
- 2nd Line drugs
- MDR TB / XDR TB

UNIT-X: ANTI ASTHMATIC DRUGS

- Beta-Adrenoreceptoragonist – systemic and inhaled
- Corticosteroids – systemic and inhaled
- Anti-leucotriene antagonist
- Sodium Cromoglycate
- Theophylline
- Anticholinergic drugs
- Treatment of acute attacks
- Prophylactic & long term treatment

UNIT-XI: ANTIMICROBIAL DRUGS

- Antibiotics – Pencillin, Cephalosporin, Quinolones, Aminoglycosides,
- Metronidazole

UNIT-XII: ANTIVIRAL DRUGS

- Acyclovir
- Zidovudine

UNIT-XIII: ANTIFUNGAL DRUGS

- Amphotericin – B
- Ketoconazole
- Fluconazole
- Itraconazole

UNIT-XIV: CARDIOVASCULAR DRUGS

- Inotropic drugs
- Dopamine
- Dobutamine
- Isoprenaline
- Antianginal drugs - Nitroglycerine
- Antiarrhythmic drugs - Xylocard (Lignocaine), Procainamide, Amiodarone (cordarone)
- Digoxin
- Diuretics – Furosemide, Potassium sparing diuretics, Thiazides

UNIT-XV: DRUGS USED IN METABOLIC AND ELECTROLYTE IMBALANCE

- Glucose
- Bicarbonate
- Calcium
- Potassium

UNIT-XVI: ANTIINFLAMMATORY DRUGS

- Steroids
- Non steroidal anti-inflammatory drugs

UNIT-XVII: ANAESTHETIC DRUGS

- Muscle relaxants
- Local anaesthetic – Lignocaine / Lidocaines

RECOMMENDED BOOKS:

1. Essentials of medical pharmacology, KD Tripathi
2. Pharmacology for Dental & Allied health sciences, PadmajaUdayakumar

REFERENCE BOOKS:

1. Essentials of medical pharmacology-Tripathi-7th edition-2013

4. PHARMACOLOGY RELATED TO RESPIRATORY CARE **TECHNOLOGY-PRACTICAL(UE)**

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop clarity on various pharmacological requirements in hospital.
- To inculcate knowledge on various procedures related to respiratory care.

LEARNING OBJECTIVE SKILLS:

- Will be able to demonstrate mechanism of action of various drugs.
- Will be able to recognize metabolic changes with clarity in pharmacological aspects.
- Will be able to support physicians in various respiratory treatments following laboratory safety.

PRACTICALS / DEMONSTRATIONS:

1. SPOTTERS

- I.V fluids
- Anti tuberculosis drugs
- IV injections
- Inhalers
- Rotahalers
- Nebulizer
- Bronchodilators

2. CHARTS

- Indication
- Dosage
- Contraindications
- Effects of all respiratory drugs

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning.Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression –Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality.Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship.Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 7: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler,“**Introduction to Psychology**” – **7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.

2. Baron, R. A., & Byrne, D (2006), “**Social psychology**”, New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, “**Social psychology**” **9th edition** published by Pearson education, Inc., 2006
4. Shelley E. Taylor. “**Health Psychology**” **Third Edition**. McGraw Hill International Editions, 1995.
5. Swaminathan, V.D, Latha Sathish, “**Psychology for Effective Living**”, Department of Psychology, University of Madras.
6. Coleman, James. 1980. “**Abnormal Psychology and modern life**”. New Delhi: Tata McGraw Hill Ltd.

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans-humanism, bio-weapons.

UNIT-II

Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.

UNIT-III

Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.

UNIT-IV

Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.

UNIT-V

Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

SEMESTER-IV

| SL.NO | SUBJECT |
|--------------|----------------|
| | |

| | |
|---|---|
| 1 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- Theory (UE) |
| 2 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- practical (UE) |
| 3 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- theory (UE) |
| 4 | Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- practical (UE) |
| 5 | Basics and advanced life support (IE) |
| 6 | Medical sociology (IE) |

SEMESTER - IV

1. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY PAPER – I (UE)

COURSE DESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- To inculcate knowledge on various respiratory diseases and disorders.
- To elaborate on infections and their control while handling patients with respiratory illness

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases and their causes.
- Will be able to demonstrate the organism that can cause a specific infection.
- Will be able to express safety while handling patients with respiratory distress.

UNIT-I: INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

UPPER RESPIRATORY TRACT INFECTION

- Acute Rhinitis
- Acute Sinusitis
- Acute Pharyngitis
- LaryngoTracheitis
- Epiglottitis
- Acute otitis media

UNIT-II: LOWER RESPIRATORY TRACT INFECTION-I

- Bronchitis
- Pneumonia
- Pneumococcal pneumonia
- Staphylococcal pneumonia
- H.Influenza infection
- Klebsiella pneumonia
- Pseudomonas pneumonia
- Anaerobic pulmonary infection

UNIT-III: LOWER RESPIRATORY TRACT INFECTION-II

- Empyema
- Lung abscess
- Bronchiectasis
- Atypical pneumonia
- Viral pneumonia
- Mycobacterial infection
- Tuberculosis-Clinical features, diagnosis and treatment (Pulmonary and extra Pulmonary TB)
- Mycobacterial infection other than tuberculosis
- Aspergillus lung disease
- Nocardiosis
- Actinomycosis
- Tropical eosinophilia
- Pulmonary infection and complication in HIV infected patients
- Hospital acquired pneumonia
- Ventilator associated pneumonia

UNIT-IV: NON INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

- Thrombo embolic disease.
- Pulmonary hypertension
- Sleep apnoea,
- Alveolar hypoventilation
- Obesity hypoventilation

UNIT-V: OCCUPATIONAL LUNG DISEASES

- Environmental and occupational disease
- Silicosis.
- Coal workers pneumoconiosis.
- Asbestos related disease.
- Occupational asthma.
- Hypersensitivity pneumonitis.
- Idiopathic/immunologic/Granulomatous disease-sarcoidosis.
- Benign neoplasm of lung - bronchial carcinoids.
- Lung cancer - etiology, pathology, classification, staging, treatment

RECOMMENDED TEXT BOOKS:

1. Text book of pathology – Pocket Harsh Mohan's - 2nd edition, 2013
2. Basic pathology – Pocket Robbins – 7th edition, 2014

REFERENCE BOOKS:

1. Principles and practice of medicine – Davidson's – 22nd edition, 2014

2. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY

PAPER I –PRACTICAL (UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop knowledge on various respiratory disease and disorders.
- To develop knowledge on safety and infection control methodologies.

LEARNING OBJECTIVE SKILLS:

- Will be able to perform various diagnostic procedures in support to the physicians.
- Will be able to demonstrate competency in interpretation of applied microbiological aspects.
- Will be able to express better safety protocols for handling patients with respiratory tract infections.

PRACTICALS/DEMONSTRATIONS:

- All the types of Pneumonia - Atypical pneumonia, Klebsiella pneumonia. Tuberculosis.
- Case discussion- Lung abscess - Signs, symptoms, diagnosis and treatment, Occupational lung diseases - Signs, symptoms, diagnosis and treatment, Lung cancer – Etiology, pathology, classification and treatment.

**3. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL
EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY
PAPER - II– THEORY(UE)**

COURSE DESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- To develop knowledge on drugs and their pharmacokinetics.
- To develop in depth knowledge on diagnostic procedures of various respiratory diseases.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT-I: AIRWAY DISEASES

- Asthma – clinical presentation and diagnosis, investigation and management pharmacology.
- COPD - Definition, clinical features, laboratory manifestation, patho-physiologies, management, pulmonary rehabilitation
- Emphysema
- Acute respiratory failure – pathogenesis of ARF lung failure, pump failure, pulmonary pathology, leading to acute respiratory failure.

UNIT-II: RESTRICTIVE LUNG DISEASES

- Acute Restrictive pathology
- Equal diminishment of all lung volumes
- Major diminishment of vital capacity
- Major diminishment of functional residual capacity
- Atelectasis
- Neuromuscular diseases
- Central nervous system depression

UNIT-III: DISEASES OF PLEURA

- Pleural effusion
- Pneumothorax

UNIT-IV: DISEASES OF MEDIASTINUM AND CHEST WALL

UNIT-V: CLINICAL EVALUATION OF THE PULMONARY SYSTEM

- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Assessment of portable chest x-ray, principle of x-rays, assessing the chest film.
- The application of pulmonary function studies, tidal volume, minute volume, FVC, negative inspiratory force, clinical importance.

UNIT-VI: PRINCIPLE IN THE ASSESSMENT OF PULMONARY PERFORMANCE

UNIT-VII: DISORDERS OF THE PULMONARY INTERSTITIUM

UNIT-VIII: LUNG IN SYSTEMIC DISORDERS

- RA
- SLE
- PSS

UNIT-IX: EFFECTS OF AIR POLLUTION ON LUNG

RECOMMENDED TEXT BOOKS:

1. Text book of pathology – Pocket Harsh Mohan's - 2nd edition, 2013
2. Basic pathology – Pocket Robbins – 7th edition, 2014

REFERENCE BOOKS:

1. Principles and practice of medicine – Davidson's – 22nd edition, 2014

4. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY

PAPER – II – PRACTICAL(UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop knowledge on drugs and their pharmacokinetics.
- To develop in depth knowledge on diagnostic procedures of various respiratory diseases.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Clinical evaluation of the pulmonary system
- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Assessment of portable chest x ray
- Principle of x rays
- Assessing the chest film
- The application of pulmonary function studies
- Tidal volume
- Pulmonary rehabilitation

BASIC AND ADVANCED LIFE SUPPORT

1. BLS
2. TRIAGE

3. Primary Survey
4. Secondary Survey
5. Airway & Ventilatory management
6. Shock
7. Central & peripheral venous access
8. Thoracic trauma – Tension pneumothorax
9. Other thoracic injuries
10. Abdominal trauma – Blunt injuries
11. Abdominal trauma – Penetrating injuries
12. Spine and spinal cord trauma
13. Head trauma
14. Musculoskeletal trauma
15. Electrical injuries
16. Thermal burns
17. Cold injury
18. Pediatric trauma
19. Trauma in pregnant women
20. Workshop BLS
21. Workshop cervical spine immobilization
22. Imaging studies in trauma
23. The universal algorithm for adult ECC
24. Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
25. Pulseless electrical activity (PEA) / asystole algorithm
26. Bradycardia treatment algorithm
27. Tachycardia Treatment algorithm
28. Hypotension / Shock
29. Acute myocardial infarction
30. Pediatrics Advanced life support
31. Defibrillation
32. Drugs used in ACLS
33. Emergency cardiac pacing
34. AED
35. Techniques for oxygenation and ventilation

MEDICAL SOCIOLOGY

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

- Definition, Historical background, subject matter of sociology, Nature and scope, Importance, Sociology of India, Relationship of sociology with other social sciences

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

- Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change,

Unit 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste Comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

- Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization,

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications

3. Neil J.Smelser, Handbook of sociology, 1988. sage publication
4. Johnson R.M, Systematic Introduction to Sociology, 1960, Allied Publishers
5. Cultural Anthropology, Barbara D. Miller, 2006 Pearson/Allyn and Bacon Co
6. C.N. Shankar Rao., Introduction to Sociology, 2008, S. CHAND & Company Publications.
7. C.N. Shankar Rao., Sociology of India, S. CHAND & Company Publications.

SEMESTER-V

| SL.NO | SUBJECT |
|--------------|---|
| 1 | Respiratory care technology Part I – Paper I – Theory(UE) |
| 2 | Respiratory care technology Part I – Paper I – Practical(UE) |
| 3 | Respiratory care technology Part I – Paper II – Theory(UE) |
| 4 | Respiratory care technology Part I – Paper II – Practical(UE) |
| 5 | Environmental science and Community medicine – Theory(IE) |

SEMESTER-V

1. RESPIRATORY CARE TECHNOLOGY PART I – PAPER I – THEORY(UE)

COURSE OBJECTIVE

- The Student will be able to demonstrate the competent ability to perform and operate respiratory equipments designed to deliver medical gas therapy.
- Perform diagnostics tests performed to evaluate the cardiopulmonary function and tests to evaluate blood gas transport – arterial blood gas analysis.
- Demonstrate the knowledge of the function and troubleshooting of spirometry equipments, bronchoscope, thoracoscope, and its operations, etc.,

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT I:

OXYGEN SUPPLY SYSTEM

- Identification of medical cylinders, Safety precaution on using, Calculation of cylinder contents, Medical gas piping, Liquid oxygen systems, Flow meter & regulators

OXYGEN ADMINISTRATION

- Low flow oxygen therapy (nasal cannula, Partial re-breathing mask, Disposable non re-breathing mask) High flow oxygen delivery system (Venturi mask, Enclosures, Croupettes, Isolette, Head box)

OXYGEN THERAPY

- External respiration (FiO_2 , Alveolar gas exchange, mixed venous oxygen content, Distribution of ventilation)
- Blood oxygen transport (Cardiac output, Oxygen, Hemoglobin oxygen affinity)

- Hypoxemia (Physiologic causes of hypoxemia, Pulmonary response to hypoxemia, Cardiovascular response to hypoxemia, Hypoxemia and oxygen therapy) Internal respiration (Tissue hypoxemia, Dyoxia)

GOALS OF OXYGEN THERAPY

- Administration of oxygen (FiO_2 , Gas delivery systems)

CLINICAL GUIDELINES FOR OXYGEN THERAPY

- Evaluation of oxygen therapy (Physical examination of cardiopulmonary systems, Arterial blood gas measurements)

OXYGEN AS A DRUG

- Indications of oxygen therapy, Administration, Uptake and distribution, Metabolism and excretion.

UNIT II:

HYPOXEMIA AND OXYGEN THERAPY

- Refractory hypoxemia: Clinical relevance

HYPOXIC PULMONARY VASOCONSTRICTION (HPV)

PHYSIOLOGIC SHUNTING AND OXYGEN THERAPY

DENITROGENATION ABSORBING ATELECTASIS (Clinical relevance)

PULMONARY OXYGEN TOXICITY

- (Intracellular metabolism of oxygen, Alveolar oxygen tensions, Indications for 70% to 100% Oxygen)
- Helium / Oxygen therapy
- Nitric Oxide
- Hyperbaric oxygen therapy

UNIT III:

PULMONARY FUNCTION TESTING EQUIPMENTS

- Volume displacement spirometer, Blood gas electrodes, Oximeters related devices, Body plethysmography.

COMPUTERS IN THE PULMONARY FUNCTION LABORATORY

QUALITY ASSURANCE IN THE PULMONARY FUNCTION LABORATORY

AFFECTING FACTORS – ANALYTICAL – NON ANALYTICAL
INTERPRETING RESULTS & REPORTING
PULMONARY FUNCTIONS TESTS

- Lung volume test
- Ventilation and “ventilatory control test”
- Pulmonary mechanics using spirometer
- Gas distribution test using He dilution, N₂ , washouts, body plethysmography
- Dilution factor for carbon monoxide
 - Single breath method
 - Steady state methods
- Blood gas analysis, capnography and related test
- Exercise testing – 6-minute walk test, sit-to-stand test, shuttle walk test, CPET
- Specialized test, non invasive monitoring
- Before and after bronchodilator studies
- Quantitative methacholator tests
- Testing for exercise induced asthma
- PFT for disability
- PFT in children
- Critical care monitoring
- Bronchial provocation tests
- Sweat chloride test
- Saccharine test
- The application of bedside pulmonary function studies (Tidal volume, minute ventilation, forced vital capacity, negative inspiratory force, clinical interpretation)

UNIT IV:

DIAGNOSTIC PROCEDURES

- Bronchoscopy(Rigid bronchoscope, Flexible fiber optic bronchoscope, Equipment maintenance Transbronchial lung biopsy, Bronchoalveolar lavage, Pediatric bronchoscope)
- Fluoroscopy
- Lung biopsy(Percutaneous fine needle biopsy, Open cut biopsy, needle biopsy of pleura)
- Thoracoscopy
- Mediastinoscopy
- Transtracheal aspiration

- Imaging sciences(Assessment of the portable chest x-rays, Principle of X-rays, computerized tomography, bronchography, pulmonary angiography)
- Nuclear magnetic resonance imaging
- MRI
- Diffusion and Perfuion scan
- Ultrasound thorax
- Bedside use of arterial and venous oximetry
- Disturbances of alveolar ventilation
- Right heart catheterization and monitors of arterial pressure
- Chest tube insertion and monitoring

UNIT V:

ARTERIAL BLOOD GAS ANALYSIS – Evaluate/Acid base homeostasis

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

2. RESPIRATORY CARE TECHNOLOGY PART I – PAPER I – PRACTICAL (UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Oxygen delivery devices
- Bronchoscope
- Thoracoscope
- Lung biopsy needles
- ICD tube
- Spirometer
- PFT interpretation
- ABG interpretation
- Chest X-Rays

3. RESPIRATORY CARE TECHNOLOGY PART – I PAPER – II - **THEORY(UE)**

COURSE DESCRIPTION:

- To gain knowledge about pulmonary edema and acute lung injury and its therapeutic modalities involved in the management of the same.
- The student will be able to demonstrate understanding and apply knowledge on chain of infection, cross contamination. To possess knowledge about importance of infection control, hand washing, universal precautions.
- The student will be able to demonstrate understanding and knowledge of EEG, sleep staging, respiratory and cardiovascular monitoring sleep related breathing disorders, etc.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT I:PULMONARY OEDEMA

- Etiology
- Types of pulmonary edema
- Hemodynamic Pulmonary edema
- Neurogenic Pulmonary edema
- Re-expansion edema
- Permeability Pulmonary edema
- General principles of therapy
- Cardiogenic Pulmonary edema
- Preload reduction
- After load reduction
- Increasing contractility
- Supportive therapy
- Fluid therapy and pulmonary edema

UNIT II:ACUTE LUNG INJURY

- Parenchymal responses to injury

- Acute lobar and segmental atelectasis
- Pulmonary embolisation
- Diffuse parenchymal function
- Defining ARDS
- Infant respiratory distress syndrome
- Defining Acute Lung Injury (ALI)
- The NCE/ARDS spectrum
- Refractory Hypoxemia
- Compliance
- Non cardiogenic edema
- Adult lung injury
- Clinical diagnosis of ALI
- Toxic oxygen radicals and ALI
- Principles of airway pressure therapy in ALI
- Positive - pressure ventilation
- PEEP therapy in ALI
- Early prophylactic PEEP therapy
- Fluid therapy of ALI
- Specific therapy of ALI

UNIT III:TOXIC INHALATION

- Aspiration pneumonia (definition, Diagnosis, Clinical assessment, management)
- Bacterial aspiration
- Near drowning
- Carbon monoxide poisoning(Diagnosis, Treatment)
- Smoke inhalation
- Toxic Fume inhalation
- Thermal injury

UNIT IV: PULMONARY REHABILITATION

- Home rehabilitation
- Home oxygen administration
- Oxygen concentrator
- Smoking cessation

- Muscle Strengthening Exercises
- Yoga therapy

UNIT V:LUNG TRANSPLANTATION

UNIT VI: BASIS OF ASEPSIS

- Mechanism of micro organism transmission
- Universal (standards) precautions
- Isolation procedures: infection control
- Sterilization and disinfection techniques

RECOMMENDED TEXT BOOKS:

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.
- Craig L, Scanlan, Egan’s Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, H Ellan, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B saunders company USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.

4. RESPIRATORY CARE TECHNOLOGY PART – I PAPER – II - PRACTICAL(UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Universal precaution materials
- ARDS lung
- Pulmonary edema lung
- Oxygen concentrator
- Smoking cessation
- PEEP therapy

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.
- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem
- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem Diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic
- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.
- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.
- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of

disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology -Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.
- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Wholesome water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.
Air pollution & its effects. Prevention & Control of air pollution
Ventilation : Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

SEMESTER - VI

| SL.NO | SUBJECT |
|--------------|--|
| 1 | Respiratory care technology Part II - Paper- I – Theory(UE) |
| 2 | Respiratory care technology Part II - Paper- I – Practical(UE) |
| 3 | Respiratory care technology Part II - Paper- II – Theory(UE) |
| 4 | Respiratory care technology Part II - Paper- II – Practical(UE) |
| 5 | Healthcare and basic principles(IE) |

SEMESTER VI

1. RESPIRATORY CARE TECHNOLOGY PART II - PAPER- I **– THEORY(UE)**

COURSE OBJECTIVE:

- Demonstrate the competency ability to perform and operate respiratory equipments designed to deliver metal gas therapy, humidity and areosal therapy.
- Demonstrate the competency ability to perform chest physical therapy and postural drainage in patients with retained secretions.
- To provide a basic knowledge and understanding of ECG and CVP monitoring.
- Recognize life threatening situation and administer necessary patient care.
- Demonstrate competency to understand and gain knowledge about sleep related disorders and EMG monitoring, narcolepsy, sleep seizures etc.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT I: BRONICAL HYGIENE THERAPY RETAINED SECRETIONS

- Mucociliary escalator
- Mucociliary activity, mucous production
- Parenchymal hygiene
- The cough mechanism
- Anatomy of cough mechanism, purpose of cough mechanism
- Pathophysiology of retained secretions
- Clinical manifestations
- Common etiologies of retained secretions

UNIT II: HUMIDITY AND AEROSAL THERAPY

- Humidity
- Airway humidification, humidifiers, clinical applications of humidifiers

- Aerosols
- Aerosol stability, penetration and deposition, water content, airway resistance
- Clearance of aerosols, aerosol generators, aerosol delivery devices, nebulizer
- Goals of aerosol therapy
- Jet nebulizer, hydrodynamic nebulizer, ultrasonic nebulizer
- Aid to bronchial hygiene therapy, humidification of inspired gases, delivery medications
- Administration of aerosol therapy
- Swelling of retained secretions, precipitation of bronchospasm, fluid overload, cross contaminations.

UNIT III: CHEST PHYSICAL THERAPY

- Goals of chest physical therapy
- Techniques promoting bronchial hygiene
 - Postural drainage, lung segments, chest percussion, chest vibration, cough instruction and stimulation
 - Techniques improving breathing efficiency
 - Incentive spirometry
 - Defining sustained maximal inspiration
 - Rationale SMI prophylaxis, clinical goals of SMI and administration.

IPPB THERAPY

- Physiology of IPPB the work of breathing, clinical goals.
- The criteria of IPPB effectiveness

UNIT IV: HEMOSTASIS

- Hemodynamic monitoring
- ECG arrhythmias diagnosis
- Bedside interpretation of ECG tracing
- Central venous pressure monitoring

- Thermo dilation cardiac output
- Cardiopulmonary resuscitation techniques

UNIT V: SLEEP RELATED MOVEMENT DISORDERS AND EMG MONITORING

The student will learn an overview of muscular structure and function as it relates to sleep, specifics regarding the lower extremities, chin and upper airway. This information will be a precursor for the discussion of periodic limb movement disorder (PLMD) and restless leg syndrome (RLS). A presentation of the criteria for scoring periodic limb movements and how to chart the findings will be discussed in this course.

NARCOLEPSY, SLEEP RELATED SEIZURES AND PARASOMNIAS

The student will learn about specific sleep disorders, emphasis is put on disorders such as parasomnias, seizures and narcolepsy or idiopathic central nervous system hypersomnia as evaluated by the polysomnography

MSLT AND MWT

The student will learn specific sleep testing protocols used in the assessment of disorders of excessive daytime somnolence. Disorders such as narcolepsy or idiopathic central nervous system hypersomnia can be evaluated by the combination of night time polysomnography followed by a multiple sleep latency test (MSLT) starting the following morning. The test measures the time it takes to fall asleep when the opportunity is presented. An alternative to the MSLT is the maintenance of wakefulness test (MWT) which investigates how long wakefulness can be maintained. Electrode placement, complex procedural information and scoring criteria will be discussed

INSOMNIA, CIRCADIAN RHYTHM

The student will learn about circadian rhythm concepts and how it relates to normal sleep. This course emphasizes on the comprehension of deviations of normal sleep in relation to insomnia/psychiatric disorders.

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Principles and practices of sleep medicine – William Dement.
- George Mathew.K Medicine Prep manual 1st edition. B.I Churchill Livingstone Pvt Ltd. New delhi1995
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.
- Craig L, Scanlan, Egan’s Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, H Ellan, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B saunders company USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Braunwald (edr), Heart disease, A text book of cardiovascular medicine, 4th edition, W.B saunders company, USA 1992.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

2. RESPIRATORY CARE TECHNOLOGY PART II - PAPER- I **– PRACTICAL (UE)**

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.

- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Aerosol delivery devices
- Humidifiers
- MDI
- DPI
- ECG leads
- Cough mechanism
- Bronchospasm
- Circadian rhythm
- Incentive spirometry

3. RESPIRATORY CARE TECHNOLOGY PART II PAPER II – THEORY (UE)

COURSE OBJECTIVE:

- Demonstrate abilities in understating different artificial airway tubes, size and their utilization clinically maintenance of artificial patient airway, recognize life-threatening situations and administer necessary patient care.
- Demonstrate competent ability to perform and operate respiratory equipment designed to deliver hyperinflation therapy, mechanical ventilator support and other respiratory therapy, and arterial blood gas analysis.

- Demonstrate competent ability and assume the responsibility of transportation of critically ill.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

UNIT I: AIRWAYS

- Obstructive lesions of larynx and trachea
- Oropharyngeal airways
- Nasopharyngeal airways
- Artificial airways (Definition, Indication, Hazards of artificial airways)
- Establishing emergency airways
- Technique of intubation
- Post intubation essentials
- Cricothyroidectomy
- Emergency airways in Cardio Pulmonary Resuscitation
- Limitation of emergency airways
- Nasotracheal tube
- Morden tube material

UNIT II: MAINTENANCE OF ARTIFICIAL AIRWAYS & EXTUBATION

- Endotracheal tube Vs Tracheostomy
- Contamination of airway
- Diagnosis of airway
- Incidence of airway contamination

- Common airway contamination
- Nosocomial infections in the respiratory care
- Suctioning the airway
- Complications of the airways
- The suction catheter
- Suction techniques
- Suctioning adaptors
- Obtaining culture specimens
- Humidification of the airways
- Tracheostomy wound care
- Cuff care
- Inflation technique
- Periodic deflation
- Artificial airways emergencies
- Cuff leaks
- Inadvertent extubation

UNIT III: LARYNGEAL AND TRACHEAL COMPLICATIONS OF ARTIFICIAL AIRWAYS

- Laryngeal complications of endo-tracheal intubation, sore throat and hoarse voice
- Glottis edema, sub-glottic edema, ulceration of vocal cords, tracheal mucosa, tracheal stenosis

UNIT-IV: INTUBATION OF ADULT PATIENTS ELECTIVE/EMERGENCY VENTILATOR MANAGEMENT

- Adult patients
- Trouble shooting
- Ventilator control
- Goals and complications of the ventilator

- Indications of the ventilator
- Weaning from mechanical ventilators
- Modern mechanical ventilators
- Non-invasive ventilators
- Adult ventilator management

UNIT V: INTENSIVE CARE UNIT

- Common problems in ICU/Non-ICU Adult
- Emergency airway control and long term airway care
- Transport of critically ill
- Nutrition in ICU Patients
- Management of cardiovascular failure in ICU
- Fluid and electrolytes in critically ill patients
- Respiratory monitoring in ICU
- Physical Assessment of critically ill patients
- Important intensive care procedures
- Non invasive assessment of cardio pulmonary function.

REFERENCE BOOKS:

- Egan's Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White

4. RESPIRATORY CARE TECHNOLOGY PART II PAPER II - PRACTICAL (UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Artificial airways
- Endotracheal tubes
- Nasotracheal tubes
- Suction catheter
- Tracheostomy tubes
- Laryngoscope
- CPAP/BiPAP
- Capnography

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Principles and practices of sleep medicine – William Dement.
- George Mathew.K Medicine Prep manual 1st edition. B.I Churchill Livingstone Pvt Ltd. New delhi1995
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.

- Craig L, Scanlan, Egan's Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, H Ellan, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B saunders company USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Braunwald (edr), Heart disease, A text book or cardiovascular medicine, 4th edition, W.B saunders company, USA 1992.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

5. HEALTH CARE AND BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

- Health in Medical Care
- Indigenous systems of Health Care & their relevance
- Framework for Health Policy Development

2. Health Organization

- Historical development of Health Care System in the third world & India
- Organization & Structure of Health Administration in India
- Type of Health Organization including International Organizations
- Private & Voluntary Health care provider
- Distribution of Health Care Services
- Health Care System in Public Sector Organization
- Health systems of Various Countries

3. Health Policy and National Health Programme

- National Health Policy

- Drug Policy
- National Health Programs (Malaria, T.B., Blindness, AIDS etc.)
- Evaluation of Health Programs (Developing indicators for evaluation)
- Medical Education & Health Manpower Development

4. Health Economics

Fundamentals of Economics

- Scope & Coverage
- Demand for Health Services
- Health as an Investment
- Population, health of Economic Development

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

- Rationale for Government action
- Household capacity, income and schooling

7. Economics of Health

- Population based health services
- Economics of Communicable and Non Communicable diseases

8. Health Insurance

SEMESTER-VII

| SL.NO | SUBJECT |
|-------|-------------------------------------|
| 1 | Project/ Dissertation |
| 2 | Statistics and research methodology |

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

1. **What is statistics** – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.
2. **Measurements** – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
3. **Data collection** – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
4. **Cumulative frequency curve** – Ogives – Drawing inference from graph.
5. **Measures of central tendency** – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
6. **Measures of variability** – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
7. **Normal distribution** – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

8. **Variants from the normal distribution** – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
9. **Correlation** – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
10. **Tests of significance**- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

Date: 05.03.2018

From:

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,
Chennai.

To:

THE REGISTRAR,
Dr. M.G.R. Educational and Research Institute University,
Chennai – 95.

Respected Sir,

Sub: Approval for the introduction of Allied Health Science Courses – Regarding.

We have intended to start the following Allied Health Science Courses in addition to the already existing Allied Health Science Courses. In this regard, submitting this application for your approval.

New Courses:

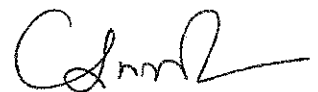
1. B.Sc. Cardiac Care Technology
2. B.Sc. Emergency & Trauma Care Technology
3. B.Sc. Clinical Nutrition
4. B.Sc. Medical Record Science
5. B.Sc. Medical Sociology

Thanking you,

Chennai,

05.03.2018

2
5/3/18



MEDICAL DIRECTOR
Dr. A. SHAW NAWAZ KHAN, B.Sc., M.S.,
MEDICAL DIRECTOR
A.C.S. MEDICAL COLLEGE & HOSPITAL
VELAPPANCHAVADI, CHENNAI - 600 077.



Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Maduravoyal, Chennai - 600 095, Tamilnadu, India.
(An ISO 9001-2015 Certified Institution)



Ref: Dr. MGR/Univ/BOS/AHS/----

14.03.2018

INTER OFFICE COMMUNICATION

To

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,

Sub: Approval for the Introduction of Allied Health Science courses – reg.

Ref: Your request letter dated: 05.03.2018.

With reference to your letter cited, I am by direction to inform that Vice Chancellor has given approval for the introduction of the following new Allied Health Science Courses in ACS Medical College and Hospital in the academic year 2018-19.

Courses:

1. B.Sc. Cardiac Care Technology
2. B.Sc. Emergency & Trauma Care Technology
3. B.Sc. Clinical Nutrition
4. B.Sc. Medical Record Science
5. B.Sc. Medical Sociology

You are requested to constitute the Board of studies for the above Allied Health Science courses and send the list to the Vice Chancellor for approval.

C. B. Babunirudh
JOINT REGISTRAR

Copy to:

President / VC/ for kind information

Joint Registrar (Staff)

Date: 29.03.2018

From:

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,
Chennai.

To:

THE VICE-CHANCELLOR,
Dr. M.G.R. Educational and Research Institute University,
Chennai

Respected Sir,

Sub: Constitution of Board of Studies – Approval Request – Regarding.


Ref: Letter from office of Vice Chancellor – 14.03.2018

We thank for your approval to start the new Allied Health Science courses, In our institute. With reference to your letter as above, we have constituted the Board of Studies for the Allied Health Science Courses as per Annexure.

Kindly accord your approval for the same.

Chennai,
29.03.2018

Submitted to the Hon'ble Thanking you,
V.C. for kind approval.
C.D. Palaniappan
29/3/18


Dr. K. MEER MUSTAFA HUSSAIN
VICE CHANCELLOR
Dr. M.G.R.

EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Periyar E.V.R. High Road,
Madhavayal, Chennai - 600 095


MEDICAL DIRECTOR

Dr. A. SHAW NAWAZ KHAN, B.Sc., M.S.,
MEDICAL DIRECTOR
A.C.S. MEDICAL COLLEGE & HOSPITAL
VELAPPANCHAVADI, CHENNAI - 600 077.

Enclosure:

1. Board of studies for Allied Health Science Particulars.



Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Maduravoyal, Chennai - 600 095, Tamilnadu, India.
(An ISO 9001-2015 Certified Institution)



Ref: Dr. MGR/Univ/BOS/AHS/----

04.04.2018

INTER OFFICE COMMUNICATION

To

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,

Sub: Approval for the Board of Studies – reg.

Ref: Your letter dated: 29.03.2018.

With reference to your letter cited, I am by direction to inform that Vice Chancellor has given approval for the list of Board of studies submitted for the Allied Health Science Courses.

You are requested to fix the date of Board of studies meeting for the Allied health science courses and intimate the date for approval.

C.B. Palani
JOINT REGISTRAR

Copy to:

President / VC/ for kind information

Joint Registrar (Staff)

Date : 18.04.2018

From:

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,
Chennai.

To:

THE VICE-CHANCELLOR,
Dr. M.G.R. Educational and Research Institute University,
Chennai – 95.

Respected Sir,

Sub: Board of Studies meeting date – Approval Request – Regarding.

Ref: Letter from the Office of the Vice- Chancellor date on 04.04.2018

We thank you for according approval of Board of Studies for the new Allied Health Science courses.

We have planned to conduct the meeting on 27.04.2018 at A.C.S. Medical College and Hospital campus.

Kindly accord your approval for the same.


Thanking you,

Chennai,
18.04.2018

*Submitted to Hon'ble V.C. for kind
approval
C O Shrivastava
18/4/18*


MEDICAL DIRECTOR

Dr. A. SHAW NAWAZ KHAN, B.Sc., M.S.,
MEDICAL DIRECTOR
A.C.S. MEDICAL COLLEGE & HOSPITAL
VELAPPANCHAVADI, CHENNAI - 600 077.


Dr. K. MEER MUSTAFA HUSSAIN
VICE CHANCELLOR
Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Periyar E.V.R. High Road,
Maduravoyal, Chennai 600 095



Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Maduravoyal, Chennai - 600 095, Tamilnadu, India.
(An ISO 9001-2015 Certified Institution)



Ref: Dr. MGR/Univ/BOS/AHS/---

23.04.2018

INTER OFFICE COMMUNICATION

To

Dr. SHAW NAWAZ KHAN. M.S,
Medical Director,
ACS Medical College & Hospital,

Sub: Approval for Conducting the Board of Studies meeting on 27.04.2018 – reg.

Ref: Your letter dated: 18.04.2018.

With reference to your letter cited, I am by direction to inform that Vice Chancellor has given approval for conducting the Board of studies meeting on 27.04.2018 for the Allied Health Science Courses.

You are requested to send the minutes of the meetings with the signatures of the members of the Board and the syllabi and curricula for the new Courses of Allied Health Sciences for the Academic council approval.

C.B. Palanivel
JOINT REGISTRAR

Copy to:

President / VC/ for kind information
Joint Registrar (Staff)

From

Dr. PRAGNA B. DOLIA. M.D

Dean,

A.C.S. Medical College and Hospital,

Chennai-77

To

The Registrar,

Dr. M. G. R, Educational and Research Institute,

Chennai- 95

Respected Sir,

Subject: Approval for the introduction of Allied Health Science Courses- regarding.

We have intended to start the following Allied Health Science Courses in our Institute.

This application is submitted for your approval of the following Courses:

B.Sc. Physician Assistant

B.Sc. Operation Theatre and Anesthesia Technology

B.Sc. Medical Laboratory Technology

B.Sc. Renal Dialysis Technology

B.Sc. Radiology and Imaging Science Technology

B.Sc. Respiratory Care Technology

B.Sc. Optometry

B.Sc. Cardiac Perfusion Technology

Diploma in Optometry Technology

Diploma in Ophthalmic Nursing Assistant

Diploma in Medical Laboratory Technology

Diploma in Dialysis Technology

Thanking you,

Chennai

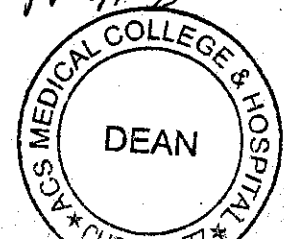
09.02.2017

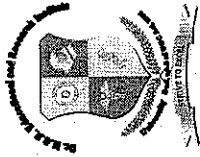
9/2/17

Pragna

DEAN

9/2/17





Dr. M.G.R.
Educational and Research Institute
University
(Declared as deemed to be University, 4/5/99 of Govt. of India)
Maduravoyal, Chennai-600 095.
(An ISO 9001 : 2008 Certified Institution)

Ref: Dr.MGR/Univ/BOS/AHS/001

15.02.2017

INTER OFFICE COMMUNICATION

To,

Dr.Pragna B.Doliya,
Dean, ACS Medical College and Hospital,
Chairperson, Allied Health Sciences.

Sub : Approval for the Introduction of Allied Health Science
Courses – reg.

Ref : Your request letter dated : 09.02.2017.

With reference to your letter cited, I am by direction to inform that Vicechancellor has given approval for the introduction of the following Allied Health Science courses in ACS Medical College and Hospital in the academic year 2017-18.

1. B.Sc (Physician Assistant)
2. B.Sc (Operation Theatre and Anaesthesia Technology)
3. B.Sc (Medical Laboratory Technology)
4. B.Sc (Dialysis Technology)
5. B.Sc (Cardiac Care Technology)
6. B.Sc (Radiology and Imaging Technology)
7. B.Sc (Respiratory Therapy)
8. B.Sc (Optometry Technology)
9. Diploma in Optometry Technology

From:

Dr. PRAGNA B. DOLIA. M.D

Dean,

A.C.S Medical College and Hospital,

Chennai - 77

To:

THE VICE-CHANCELLOR.

DR. M.G.R. Educational and Research Institute University,

Chennai - 95

Respected Sir,

Subject: Constitution of Board of Studies - Approval Request - Regarding

Reference: Letter from office of Vice-Chancellor - 15.02.2017

We thank for your approval to start the Allied Health Science Courses in our Institute. With reference to your letter as above we have constituted the Board of Studies for the Allied Health Science Courses as per Annexure.

Kindly accord your approval for the same.

Thanking You,

Chennai,

03.03.2017



A.C.S MEDICAL COLLEGE AND HOSPITAL
 Velappanchavadi , Chennai-77.
 Constituent of
Dr.M.G.R
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
 (Decl.u/s 3 of UGS ACT 1956)

BOARD OF STUDIES

01.03.2017

The Board of studies for the BSc, Allied Health Science courses has been constituted as under-

Basic Sciences (for Common to all the Allied Health Science courses)

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|----------------------------|---|------------------------|
| 1. | Dr. Pragna B Dolia | Dean | Chair Person |
| 2. | Dr. M.Sasirekha | Professor and Head, Anatomy | Member |
| 3. | Dr. Mahima Sophia | Associate Professor, Anatomy | Member |
| 4. | Dr. M.Ganesh | Professor & Head, Physiology | Member |
| 5. | Dr. Sureka Varalakshmi | Professor, Physiology | Member |
| 6. | Dr. G.Brindha | Professor & Head, Biochemistry | Member |
| 7. | Dr. B.KalaiSelvi | Professor & Head, Pharmacology | Member |
| 8. | Dr. S.A.Sridevi | Professor, Pharmacology | Member |
| 9. | Dr. Shantha Mohanasundaram | Professor & Head, Pathology | Member |
| 10. | Dr. P.Mahendranath | Associate Professor, Pathology | Member |
| 11. | Dr. H.Kalavathy Victor | Professor & Head, Microbiology | Member |
| 12. | Dr. B.Ananthi | Professor, Microbiology | Member |
| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
| 1. | Dr.Senthil Kumar | Professor , Anatomy Sri Ramachandra Medical College and Research Institute ,Chennai | External Member |
| 2. | Dr.Sumathi.G | Professor, Microbiology, Sri Muthukumaran Medical college and Research Institute,Chennai | External Member |

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|--|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.N.Raghu | Professor, Dept. of General Medicine | Member |
| 3 | Dr.B.Krishnasamy | Professor, Dept. of General Medicine | Member |
| 4 | Dr.C.Senthil | Associate Professor, Dept. of General Medicine | Member |
| 5 | Dr.Premanth | Assistant Professor, Dept. of General Medicine | Member |
| 6. | Dr. Subramaniam | Associate Professor, Dept of General Medicine , Sri Muthukumar Medical college and Research Institute, Chennai | External Member |

B.Sc. Operation Theatre and Anesthesia Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|---|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.Ravi | Professor, Dept. of Anesthesia | Member |
| 3 | Dr.Manisha | Associate Professor, Dept. of Anesthesia | Member |
| 4 | Dr.S.Rama | Associate professor, Dept. of Anesthesia | Member |
| 5 | Dr.Senthil kumar | Principal (AHS), Professor, | External member |

B.Sc. Medical Laboratory Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|---|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.G.Brindha | Professor, Dept of Biochemistry | Member |
| 3 | Dr.B.Ananthi | Professor, Dept of Microbiology | Member |
| 4 | Dr.V.Kalpna Devi | Professor, Dept of Microbiology | Member |
| 5 | Dr.P.Mahendranath | Associate Professor, Pathology | Member |
| 6 | Dr. Shoba | Professor and Head, Dept of Pathology Sree Balaji Dental College and Hospital | External Member |
| 7 | Dr.Sumathi.G | Professor, Microbiology, Sri Muthukumar Medical college and Research Institute, Chennai | External Member |

B.Sc. Renal Dialysis Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|--------------------------------|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.N.Raghu | Professor, General Medicine | Member |
| 3 | Dr.B.Krishnaswamy | Professor, | Member |

B.Sc. Radiology & Imaging Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|---------------------|--|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.Sasi Rekha | Professor and Head, Dept of Anatomy | Member |
| 3 | Dr.Senthil Anbumani | Assistant Professor, Dept of Radiology | Member |
| 4 | Dr.Senthil kumar | Professor , Anatomy Sri Ramachandra Medical College and Research Institute, Chennai | External member |

B.Sc. Respiratory Care Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|--|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.N.Raghu | Professor, Dept of General Medicine | Member |
| 3 | Dr.B.Krishnaswamy | Professor, Dept of General Medicine | Member |
| 4 | Dr.C.Senthil | Associate Professor, Dept of General Medicine | Member |
| 5 | Dr.Jackin Moses | Assistant Professor, Dept of General Medicine | Member |
| 6 | Dr.Senthil kumar | Professor , Anatomy | External member |

B.Sc. Optometry

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|--|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.P.Subba Reddy | Professor | Member |
| 3 | Dr.Radhika Dinesh | Assistant Professor | Member |
| 4 | Dr.Kanmani | Professor, Dept of Ophthalmology, Saveetha Medical College and Hospital, Chennai | External member |

B.Sc. Cardiac Perfusion Technology

| S.NO | NAME | DESIGNATION | FUNCTIONAL DESIGNATION |
|------|-------------------|---|------------------------|
| 1 | Dr.Pragna B Dolia | Dean | Chair Person |
| 2 | Dr.N.Raghu | Professor, General Medicine | Member |
| 3 | Dr.B.Krishnaswamy | Professor, General Medicine | Member |
| 4 | Dr.Loganathan | Professor, General Surgery | Member |
| 5 | Dr.Kathirvel.B | Assistant Professor, Dept of Cardio Thoracic Surgery | External Member |



Dr. M.G.R.
Educational and Research Institute
University
(Ordered as Deemed-to-be University, w/o 1 of UGC Act 1956)
Maduravoyal, Chennai-600 095.
(An ISO 9001 : 2008 Certified Institution)

Ref: Dr.MGR/Univ/BOS/AHS/002

20.03.2017

INTER OFFICE COMMUNICATION

To,

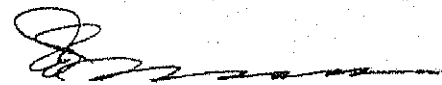
Dr.Pragna B.Doliya,
Dean, ACS Medical College and Hospital,
Chairperson, Allied Health Sciences.

Sub : Approval for the Board of Studies – reg.

Ref : Your Letter dated : 03.03.2017

With reference to your letter cited, I am by direction to inform that Vicechancellor has given approval for the lists of Board of Studies submitted for the Allied Health Science Courses.

You are requested to fix the date of Board of Studies meeting for the Allied Health Science courses and intimate the date for approval.


JOINT REGISTRAR

Copy to:

President / VC / for kind information
Joint Registrar (Staff)



Prof. Dr. S. DINAKARAN
JOINT REGISTRAR
Dr. M.G.R.
Educational and Research Institute
University
(Decl. u/s.3 of UGC Act, 1956)
Periyar E.V.R. High Road
Maduravoyal, Chennai-600 095

From:

Dr. PRAGNA B. DOLIA. M.D
Dean,
A.C.S Medical College and Hospital,
Chennai - 77

To:

THE VICE-CHANCELLOR,
DR. M.G.R. Educational and Research Institute University,
Chennai - 95

Respected Sir,

Subject: Board of Studies meeting date - Approval Request - Regarding.

Reference: Letter from the Office of the Vice-Chancellor dated 20.03.2017.

We thank you for according approval of Board of Studies for Allied Health Science Courses.

We have planned to conduct the meeting on 05.04.2017 at A.C.S Medical College campus.

Kindly accord your approval for the same.

Thanking You,

Chennai,

27.03.2017

*Submitted to the Vice-Chancellor
for approval.*

28.3.17

Just Register

P. Pragna
DEAN

Mudron
Vice Chancellor
Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Declared u/s 3 of the USC Act 1956)
Periyar E.V.R. Road,
Maduravoyal, Chennai-600 095



Dr. M.G.R.
Educational and Research Institute
University
(Ordained as deemed to be a University, u/s 3 of UGC Act, 1956)
Maduravoyal, Chennai-600 095.
(An ISO 9001 : 2008 Certified Institution)

Ref: Dr.MGR/Univ/BOS/AHS/003

03.04.2017

INTER OFFICE COMMUNICATION

To,

Dr.Pragna B.Doliya,
Dean, ACS Medical College and Hospital,
Chairperson, Allied Health Sciences.

Sub : Approval for conducting the Board of Studies meeting on
05.04.2017 – reg.

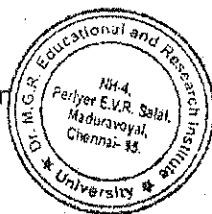
Ref : Your letter dated : 27.03.2017.

With reference to your letter cited, I am by direction to inform that Vicechancellor has given approval for conducting the Board of Studies meeting on 05.04.2017 for the Allied Health Science Courses.

You are requested to send the minutes of the meetings with the signatures of the members of the Board and the syllabi and curricula of all the B.Sc and Diploma courses of Allied Health Science, within 15 days after the Board of studies meeting, for the approval of the XXVIII Academic Council which is likely to meet on 21.06.2017.

Copy to:

President / VC / for kind information
Joint Registrar (Staff)




JOINT REGISTRAR

Prof. Dr. S. DINAKARAN
JOINT REGISTRAR
Dr. M.G.R.
Educational and Research Institute
University
(Decl. u/s.3 of UGC Act, 1956)
Periyar E.V.R. High Road
Maduravoyal, Chennai-600 095.

A.C.S MEDICAL COLLEGE AND HOSPITAL

Velappanchavadi, Chennai – 77
Constituent unit of

Dr. M.G.R
EDUCATIONAL AND RESEARCH INSTITUTE
UNIVERSITY
(Decl. u/s 3 of UGC Act 1956)

ACSMCH/Dean – Cir (014)/04-2017

04.04.2017

CIRCULAR

There will be a Board of Studies meeting for the Allied Health Sciences on 05.04.2017 at 02.00 pm in Dean's office. All the members are requested to attend the meeting without fail.

Agenda:

- I. To approve the syllabus and recommend to Academic Council.
- II. To organize orientation workshop for students and staff members.
- III. Appreciation of board of studies members who contributed to prepare syllabus.

2
4/4/17

P. S.
DEAN



From:

Dr. PRAGNA B. DOLIA. M.D
Dean,
A.C.S Medical College and Hospital,
Chennai – 77

To:

THE VICE-CHANCELLOR,
DR. M.G.R. Educational and Research Institute University,
Chennai – 95

Respected Sir,

Subject: Submission of the Minutes of Meeting of Board of Studies along with Curriculum and Syllabus of Allied Health Science Courses for 2017 - 18 – Regarding.

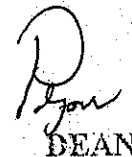
Reference: Letter from the office of Vice-Chancellor dated 03.04.2017

We are pleased to enclose the minutes of meeting of Board of Studies which was held on 05.04.2017 along with curriculum and syllabus of Allied Health Science Courses for your approval.

Thanking You,

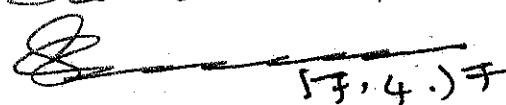
Chennai,


14.04.2017


DEAN

Enclosure :

1. Minutes of Meeting of Board of Studies
2. Curriculum and Syllabus of Allied Health Science courses

Submitted to Vice Chancellor

17.4.17


Vice Chancellor
Dr. M.G.R.
EDUCATIONAL AND RESEARCH INST
UNIVERSITY
(Declared u/s 3 of the UGC Act 1956)
Periyar E.V.R. Road,
Maduravoyal, Chennai-600 (

A.C.S MEDICAL COLLEGE AND HOSPITAL




















Velappanchavadi, Chennai-77.
Constituent unit of

Dr.M.G.R EDUCATIONAL AND RESEARCH INSTITUTE UNIVERSITY


(Decl.u/s 3 of UGS ACT 1956)

Minutes of Meeting of Board of Studies

The Board of Studies meeting was held on 5th April 2017 at 2.30 pm in Medical Education Unit (MEU), the following persons were attended.

| S.NO | NAME | DESIGNATION | SIGNATURE |
|------|---------------------|--|---|
| 1 | Dr.Pragna B Dolia | Dean |  |
| 2 | Dr.N.Raghu | Prof & Head Department of General Medicine |  |
| 3 | Dr.B.Krishnaswamy | Professor Department of General Medicine |  |
| 4 | Dr.Ravi | Prof & Head Department of Anaesthesia |  |
| 5 | Dr.G.Brindha | Prof & Head Department of Bio Chemistry |  |
| 6 | Dr.B.Ananthi | Professor Department of Micro Biology |  |
| 7 | Dr.Sasi Rekha | Professor Department of Anatomy |  |
| 8 | Dr.P.Subba Reddy | Prof & Head Department of Ophthalmology |  |
| 9 | Dr.C.Senthil | Associate Professor, Department of General Medicine |  |
| 10 | Dr.Manisha | Associate Professor, Department of Anaesthesia |  |
| 11 | Dr.S.Rama | Associate Professor, Department of Anaesthesia |  |
| 12 | Dr.P.Mahendranath | Associate Professor, Department of Pathology |  |
| 13 | Dr.Premnath | Assistant Professor, Department of General Medicine |  |
| 14 | Dr.C.Vanishree | Assistant Professor, Department of Anaesthesia |  |
| 15 | Dr.Chendhilraja | Assistant Professor, Department of Anaesthesia |  |
| 16 | Dr.R.Sophia Abigail | Assistant Professor, Department of Micro Biology |  |
| 17 | Dr.A.Prathiba | Assistant Professor, Department of Pathology |  |
| 18 | Dr.Senthil Anbumani | Assistant Professor, Department of Radiology |  |
| 19 | Dr.Jackin Moses | Assistant Professor Department of TB & Chest |  |

External:

| S.NO | NAME | DESIGNATION | SIGNATURE |
|------|------------------|--------------------------|---|
| 1 | Dr.Senthil Kumar | Professor Anatomy (SRMC) |  |

Minutes of Meeting of Board of Studies

We are pleased to inform that we have conducted the meeting on 05.04.2017.

Agenda :

1. Framing the curriculum and Syllabus for the Allied Health Science Courses.

Chair Person welcomed the participants and initiated the discussion of

Curriculum and Syllabus.

After discussing in detail the same is passed in the board of studies



DEAN

A.C.S MEDICAL COLLEGE AND HOSPITAL

Velappanchavadi, Chennai – 77

Constituent unit of

Dr. M.G.R

EDUCATIONAL AND RESEARCH INSTITUTE

UNIVERSITY

(Decl. u/s 3 of UGC Act 1956)

Date: 07.04.2017

MINUTES OF THE MEETING

Minutes of meeting of Board of Studies in Allied Health Sciences held on 5th April 2017 at ACS Medical College and Hospital.

The agenda for the meeting was as follows:

1. To approve the syllabus for the newly proposed AHS courses and recommend the same to Academic Council, Dr. M.G.R. Educational and Research Institute, Chennai.
2. To organize orientation workshop for students and staff members of AHS.
3. Appreciation of Board of studies members who contributed to prepare syllabus.

Dr. Pragna B. Dolia, chairperson of the meeting welcome the members and introduced them.

I. To approve the syllabus and recommend to Academic Council.

Dr. Pragna B. Dolia, Dean and Chairperson informed the members that the Faculty of AHS has been entrusted the responsibility to start the B.Sc., Degree Courses from the academic year 2017-2018 as approved in the Academic Council.

Syllabus were framed for the following B.Sc AHS Courses

- ❖ B.Sc Physician Assistant
- ❖ B.Sc Operation Theatre & Anaesthesia Technology
- ❖ B.Sc Cardiac Perfusion Technology
- ❖ B.Sc Radiology and Imaging Science Technology
- ❖ B.Sc Renal Dialysis Technology
- ❖ B.Sc Respiratory Care Technology
- ❖ B.Sc Optometry
- ❖ B.Sc Medical Laboratory Technology

The Chairperson reported the members that the department conducted meeting for the staff members indulged in AHS activities, and also monitored their activities on behalf of the department in the capacity of honorary field co-ordinator to discuss the contents of the syllabus to be framed. On the suggestions of various experts, the contents are designed considering the various aspects and need of the society. The members proposed the duration of the course period as 3 years with 1 year internship and appreciated the contents of the syllabus and it was resolved as under.

"Resolved that the syllabus for AHS was approved and recommended to Academic Council"

II. To organize orientation workshop for students and staff members.

Dr. Pragna B. Dolia, Dean and Chairperson briefed the members about the need of orientation workshop for students and staff members. The discussion was held among the members and it was suggested to conduct students and staff training separately.

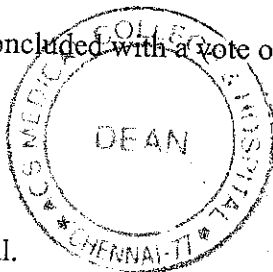
"Resolved that the organization of orientation workshop for students and staff members be conducted separately"

III. Appreciation of board of studies members who contributed to prepare syllabus.

The Chairperson appreciated the members for their efforts to prepare the syllabus for the B.Sc courses in AHS.

Finally the meeting was concluded with a vote of thanks to the chair.

Dr. Pragna B. Dolia M.D. *PBW*
Dean and Chairperson
Allied Health Sciences
A.C.S. Medical College and Hospital.



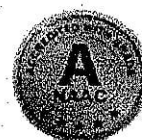


Dr. M.G.R.
Educational and Research Institute
University

(Declared as Deemed to be University u/s.3 of UGC Act 1956)

Maduravoyal, Chennai – 95

(An ISO-9001: 2008 Certified Institution)



21.06.2017

MINUTES OF THE 28th MEETING OF THE ACADEMIC COUNCIL

The 28th meeting of the Academic Council was held on 21.06.2017 (Wednesday) at 10.00 am at Mini Seminar Hall at Anna Block under the Chairmanship of Dr. K. Meer Mustafa Hussain, Vice Chancellor of the University. Out of 81 members, 50 members have participated in the meeting. (The list of members participated in the meeting is enclosed).

1. Dr. K. Meer Mustafa Hussain, Vice Chancellor and Chairman of the Academic Council welcomed the members of Council and read out the University report on the various important events/activities which have taken place after the date of 27th Academic Council Meeting to till date. (ie from 14.12.2016 to 21.06.2017)
2. The Registrar placed the Minutes of 27th Academic Council Meeting for approval. While reading the minutes of last Academic Council meeting by the Registrar, Head, Department of Mechanical Engineering intervened and insisted that the introduction of five year M.Tech integrated program discussed and kept in abeyance in the last Academic Council meeting has to be considered now. After hearing various suggestions of members of the Council during the meeting, the Vice Chancellor advised to take up the issue with UGC/AICTE for their guidance by writing a letter. All the items of 27th Academic Council meeting minutes have been unanimously approved.
3. Controller of the Examinations read out the University even semester Examination results held in May/June., 2017 of UG/PG of E & T, Architect, and H&S. Since the results of BDS/MDS programs not published, the details of the said results not recorded. The results of the Examinations were finally ratified by the Academic Council unanimously.

C.B. Palanisamy

[Signature]

4. With regard to the issue of Panel of Examiners, the Vice Chancellor advised that the Controller of Examiner shall discuss with the Vice Chancellor before forming the Panel and for necessary approval
5. Registrar placed the updated Revised New Regulations 2017 for approval. Members of the Academic Council approved the 2017 Regulations unanimously.
6. The Medical Director, Faculty of Allied Health Sciences, ACS Medical College and Hospital of our University, proposed to introduce the following programs of B.Sc and Diploma Courses under the Faculty of Allied Health Sciences.
 1. B.Sc (Physician Assistant)
 2. B.Sc (Operation Theatre & Anesthesia Technology)
 3. B.Sc (Medical Laboratory Technology)
 4. B.Sc (Renal Dialysis Technology)
 5. B.Sc (Radiology & Imaging Science Technology)
 6. B.Sc (Respiratory Care Technology)
 7. B.Sc (Optometry)
 8. B.Sc (Cardiac Perfusion Technology)
 9. Diploma in Optometry Technology
 10. Diploma in Dialysis Technology
 11. Diploma in Ophthalmic Nursing Assistant
 12. Diploma in Medical Laboratory Technology

The Vice Chancellor asked some relevant queries regarding, eligibility, duration of courses, Pattern of Examinations, UGC/MCI approval etc. The Medical Director clarified that the MCI approval not required for commencing the said programs and the UGC approval only is necessary. Further he said the programs will be started from 2017-2018 academic year. The Dean Dental intervened and raised the issue regarding the benefit of completion of the said B.Sc courses under the faculty of Allied Health Sciences. The Medical Director clarified that after successful completion of the above courses, the Students will be getting employment opportunity as Medical Assistants and will be used for assisting Doctors in their respective fields in Hospitals/Clinics. After discussing the issue in detail, the proposal for introduction of above programs from 2017-18 was approved by the Council.

C.B. Palaniswami
REGISTRAR


VICE CHANCELLOR

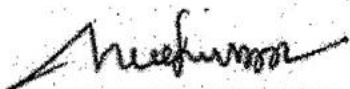
7. Dean (E&T) placed the proposal regarding restructure of B.Tech Programs under the new 2017 regulations. During the discussion, the issue of availability of facilities such as Syllabus, Faculty and Department wise Infrastructure were discussed. After having elaborate discussions by the various members, the Academic Council approved the restructure of B.Tech Programs under new 2017 regulations.
8. The Dean, Faculty of Architecture made the proposal for revamping syllabus and curriculum of B.Arch program under 2017 regulations. The Academic Council approved the above proposal.
9. The proposal for introduction of the following Seven Interdisciplinary Programs of B.Design was placed by the Dean-Architecture.

1. B. Design (Interior Design & Components)
2. B. Design (Art Design)
3. B. Design (Crafts and Design)
4. B. Design (Corporate Design)
5. B. Design (Digital Concepts)
6. B. Design (Transportation Interiors)
7. B. Design (Interior Scope and Gardening)

The proposals of the new Syllabi and Curricula of above interdisciplinary programs of B. Design were discussed. The Council urged the Dean as to whether the proposed Syllabi and Curricula of the programs are in the approval lists of the Council of Architecture. After satisfactory reply by the Dean, the Academic Council approved the introduction of above interdisciplinary programs.

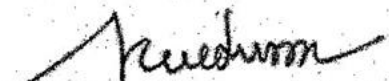
10. Head, Department of Mechanical Engineering Placed the following proposals for consideration (1) revamping syllabus and curriculum of B.Tech (Mech) full time and part time programs under new 2017 regulations, and (2) introduction of B.Tech (Robotics and Automation) Program. The Council urged the HOD to ensure, while revamping the syllabus and curriculum of above programs, the internship & project work and visit of Industry by the Students are covered in the 8th semester. The Academic Council approved revamped Curricula & Syllabi of B.Tech Mechanical Full Time and Part time and the introduction of B.Tech (Robotics and Automation) Program.

C. B. Balasubrahmanyam
REGISTRAR


VICE CHANCELLOR

11. The Head, Department of Civil Engineering placed the proposal for consideration of revamped syllabus and curriculum of B.Tech (Civil) Full Time and Part Time Programs under 2017 regulations, and the introduction of B.Sc (Environmental Studies) program. The Academic Council approved the proposals.
12. Head, Department of Electrical and Electronics Engineering submitted the proposals for consideration of revamped syllabi and curricula of B.Tech (EEE) full time and part time and B.Tech (IE) Full time and Part time, B.Tech (BMI) Full Time and Part time programs under 2017 regulations, and the introduction of B.Sc (Medical Electronics) and B.Sc (Industrial Electronics) programs. These Programs were unanimously approved by the Academic Council.
13. The Head, Department of Electronics and Communication Engineering Placed the proposal to consider the revamped syllabi and curricula of B.Tech (ECE) full time and part time programs, and B.Sc (Electronics) under 2017 regulations. In addition the HOD proposed to consider the introduction of the following five programs,
 1. B.Sc (Information Science Telecommunication)
 2. B.Sc (Remote Sensing)
 3. B.Sc (Sensor Technology)
 4. B.Sc (Data Communication and Technology)
 5. B.Sc (Communication Networks)
 and insisted to consider the replacement of Core paper "quantum computing" with the paper "Internet of things" in the B.Tech program of 2013 regulations. After discussing the above issues the Academic Council approved the introduction of the above B.Sc programs and the revamped syllabus and curriculum of B.Tech (ECE) Full Time and Part Time Programs.
14. The proposal of Head, Department of Computer Science and Engineering for the consideration of revamped Syllabi and Curricula of B.Tech (CSE) full time and part time, B.Tech (IT) full time and part time, B.Tech (ISDF), B.SC (Computer Science), B.Sc (CSN), B.Sc (ISCF) and B.Sc (ISM) programs under 2017 regulations, was unanimously approved by the Academic Council, after discussion.

C.B. Palanivelu
REGISTRAR


VICE CHANCELLOR

15. The Head, Department of Computer Applications proposed to consider the revamped syllabi and Curricula of BCA and B.SC (Animation & Visual Communication) programs under 2017 regulations. The Vice Chancellor urged the HOD to mention about Elective subjects of B.Sc Visual Communication. The HOD replied that 10 elective subjects are introduced for the above program. The Academic Council approved the above proposals.
16. The Head, Department of Chemical Engineering placed the proposal for consideration of revamped syllabus and curriculum of B.Tech (Chemical engg.) full time and part time programs under 2017 regulations. Further the HOD urged the Council for approving the program of B.Voc Course on Rubber Technology, for which our University recently signed MOU with Rubber Skill Development Council (RSDC) for commencing the proposed program of B.Voc. The Academic council suggested that the issue regarding introduction of B.Voc program on Rubber tech. may be discussed later after finalizing the availability of infrastructure facilities on Rubber Technology. The Council approved the revamped syllabus and curriculum of B.Tech (Chemical Engineering) under 2017 regulations.
17. The Dean (E&S) proposed to consider the revamped syllabus and Curriculum of First year B.Tech Program. The syllabus and curriculum of Basic learning and training subjects of 1st year B.Tech program under 2017 regulations was duly approved by the Academic Council.
18. The Head, Department of Mathematics placed the proposals to consider the revamped Syllabi of Engineering Mathematics III and IV of B.Tech Programs, Allied Mathematics, Allied Bio Statistics and the revamped syllabus and curriculum of B.Sc (Mathematics), under 2017 regulations. He further requested to consider the proposal of restructuring the curriculum of V and VI semesters of B.SC mathematics of 2013 regulations. The Academic Council agreed the above proposals.
19. The Head, Department of Physics placed the proposal to consider the revamped syllabus and curriculum of B.Sc (Physics) under 2017 regulations. The proposal was approved by the Academic Council.

C.B. Palanivel
REGISTRAR


VICE CHANCELLOR

20. The revamped syllabus and curriculum of B.Sc (Chemistry) under 2017 regulations, proposed by the Head, Department of Chemistry was approved by the Academic Council.
21. The Head, Department of Bio-Technology proposed to consider the revamped Syllabi and Curricula of B.Tech (Bio-Technology) and B.Sc (Bio-Chemistry) under 2017 regulations. The Academic Council approved the above proposals.
22. Request for considering the revamped syllabi of English I, II and Soft Skill 1 and II of UG Courses of H & S under 2017 regulations, made by the Head, Department of English was approved by the Academic Council.
23. The Head, Faculty of Pharmacy placed the proposal for consideration of Syllabi and Curricula of the new programs of B.Pharm and D.Pharm. The Chairman of Council, the Vice Chancellor, sought some clarifications from the Head/Pharmacy, such as ratio of Staff-Students, number of professors and Asst Professors, Qualification and experience of Faculty members etc. The Head/Pharmacy clarified all the required details. The Academic Council approved the syllabi and curricula of B.Pharm programmes.
24. The Head, Department of Management Studies proposed to consider the revamped syllabus and curriculum of BBA under 2017 regulations and the introduction of B.B.A (HMCT) course in the Academic year 2017-18. These proposals were approved by the Academic Council.
25. The Head, Department of Commerce proposed to consider the revamped syllabi and Curricula of B.Com (General), B.Com (Corporate Secretaryship) and B.Com (Accounting and Finance) under 2017 regulations. The proposals were accepted by the Academic Council.
26. The Head, Faculty of Physiotherapy made a request to consider the changes in the pattern of Questions papers of BPT examinations, under 2017 regulations and to increase the seats in I year BPT from 300 to 360 in the Academic Year 2017 - 18. He further informed that the existing pattern of Question paper does not have Choice. He insisted to give choices in Essay and Short notes questions in the University examinations of BPT course. After discussing the issue, the Vice Chancellor has come to the conclusion that

C.B. Palaniswamy
REGISTRAR


VICE CHANCELLOR

one choice may be given in the Essay type questions and no choice in short notes questions. Vice Chancellor's suggestion and the increase of seats in I year BPT were approved by the Academic Council.

27. The Head, Department of Hotel Management and Catering Technology, proposed to consider the revamped Syllabi and Curricula of B.Sc (HMCT) and Diploma (HMCT) programs under 2017 regulations. He also proposed for the introduction of new certificate courses and clarified the importance of introductions of certificate courses (3-6 months) and diploma course (9 months) on Bakery and Pastry based on the guidelines of the industry experts. He also proposed to introduce AHLEI institute courses for the Degree students which are beneficial and industry requirements. On clarification from Vice Chancellor, the HOD replied AHLEI institute is ready to offer 17 different Craft Level Programs (6-9 months duration) and 5 skill programs. He mentioned that while completing the said certificate courses by the Degree Students simultaneously, the students would have certification of their knowledge and skills from the AHLEI institute. After discussion, the Academic Council approved the above proposals.
28. Head, Department of education submitted the proposal for approval of the Academic Council for the revamped syllabus and curriculum of the B.Ed program and it was approved.
29. Head, Department of Nursing submitted the revamped syllabus and curriculum of B.Sc (Nursing) Programme and it was approved by the Academic Council.
30. Dean(E&T) submitted the proposal for the following intake of students to be admitted in the I year B.Tech and B.Arch courses in the academic year 2017-2018.

| S.No | Name of the B.Tech Course | Total Seats |
|------|---------------------------|-------------|
| 1 | Mechanical Engineering | 240 |
| 2 | Civil Engineering | 180 |

| | | |
|---------------------|---|-----|
| 3 | Bio Technology | 90 |
| 4 | Computer Science and Engineering | 120 |
| 5 | Information Security & Digital Forensics | 60 |
| 6 | Information Technology | 120 |
| 7 | Electronics and Communication Engineering | 120 |
| 8 | Electrical and Electronics Engineering | 60 |
| 9 | Electronics and Instrumentation Engineering | 120 |
| 10 | Bio Medical Instrumentation Engineering | 60 |
| 11 | Chemical Engineering | 60 |
| 12 | Aeronautical Engineering | 60 |
| 13 | Robotics and Automation Engineering | 60 |
| 14 | Automobile Engineering | 60 |
| Architecture | | |
| 15 | Bachelor of Architecture | 80 |

Members of the academic council, after a brief discussion, approved the above list of intake of students in the I year B.Tech and B.Arch courses in 2017-2018

31. Under any other matter, Vice chancellor submitted the proposal of awarding I Class to a candidate who has secured either 6.5 CGPA or 60% of average marks at the end of final semester Examinations. Members of the Academic Council unanimously welcomed the proposal and insisted that this is also applicable for the students who passed out their courses in 2016-2017 and approved the proposal unanimously.

The 28th Academic Council Meeting came to an end with a vote of thanks by the Registrar of the University.

C.B. P. Bhusari
REGISTRAR

Nandhu
VICE CHANCELLOR



Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)

Maduravoyal, Chennai - 600 095. Tamilnadu. India.
(An ISO 9001 : 2015 Certified Institution)



16.08.2018

MINUTES OF THE XXX ACADEMIC COUNCIL MEETING HELD ON 14.08.2018

The 30th meeting of the of the Academic Council was held on 14.08.2018 (Tuesday) at 10.30am at New Seminar Hall at Anna Block under the Chairmanship of Dr. K. Meer Mustafa Hussain, Vice – Chancellor of the Deemed to be University. 225 members participated in the meeting. (List of members enclosed).

1. Welcome Address and Report on the important events / activities of the University, after XXIX meeting of the Academic Council till date.

- Dr.K. Meer Mustafa Hussain, Vice–Chancellor and Chairman of the Academic Council welcomed the members of the Council and read out the University report on the various important events / activities which had taken place after the date of the 29th Academic Council meeting to till date(14.08.2018).
- The Chairman of the meeting also mentioned and took on record the Prestigious Honorary FRCPS Fellowship conferred on our Founder Chancellor Dr. A.C. Shanmugam by the Royal College of Physicians and Surgeons, Glasgow (UK) on 10.07.2018 for his dedicated commitment in providing quality medical care to the poor and needy at Rajarajeswari Medical College & Hospital and Rajarajeswari Dental College and Hospital at Bangalore. The members expressed their happiness and congratulated this by giving a standing ovation.

2. Minutes of the XXIX meeting of the Academic Council, placed for approval (copy enclosed).

- Dr.C.B. Palanivelu, Registrar mentioned that the copy of the previous minutes of the meeting has already been circulated.
- The Members of the Council approved the same and it was taken as read.

C.B. Palanivelu

REGISTRAR

K. Meer Mustafa Hussain

VICE CHANCELLOR

7. A) To consider the introduction of the following B.Sc Courses under the Faculty of Medicine - Allied Health Sciences

- Dr. V. Kalpana Devi, Principal A.H.S., in addition to the courses earlier approved read out the following new courses that are proposed be started in B.Sc Allied Health Sciences with the following intake.

| | | Intake |
|----|--|---------------|
| 1. | B.Sc – Clinical Nutrition | 50 |
| 2. | B.Sc – Emergency and Trauma Care Technology- | 50 |
| 3. | B.Sc – Medical Record Science | 50 |
| 4. | B.Sc – Medical Sociology | 50 |
| 5. | B.Sc – Cardiac Care Technology | 150 |

- The Members of the Council approved the introduction of the above courses.

7. B) To consider and approve the increase in intake in the following Allied Health Sciences courses for the Academic year 2018 – 19.

| | | Intake | |
|----|--|---------------|-----------|
| | | From | To |
| 1. | B.Sc – Physician Assistant | 50 | 100 |
| 2. | B.Sc – Medical Laboratory Technology | 25 | 50 |
| 3. | B.Sc – Renal Dialysis Technology | 25 | 50 |
| 4. | B.Sc – Operation Theatre & Anesthesia Tech | 50 | 200 |
| 5. | B.Sc – Respiratory Care Technology | 25 | 50 |
| 6. | B.Sc – Radiology and Imaging Science Tech. | 50 | 100 |
| 7. | B.Sc – Optometry | 50 | 100 |
| 8. | B.Sc – Cardiac Perfusion Technology | 50 | 150 |

- The above intake as proposed by the Principal, A.H.S., was approved by the members of the Council

8. To consider and note the recent announcement by Dental Council of India with regard to the examinations to be taken by MDS 2018-19 batch Students.(Copy Enclosed)

- Dr. R. RathikaRaj, Principal Dental Surgery read the notification as received from the Dental Council of India with regard to the examinations to be taken by MDS First Year students conducted by the University.
- The above was noted and approved by the Members of the Council.

C.B. Palaniswami
REGISTRAR

Neelam
VICE CHANCELLOR

9. **To consider and approve Introduction of a new course Diploma in "Acupuncture" to be conducted by Thai Moogambigai Dental College & Hospital.**

- Dr. R. Prabhakar, Dean Dental Surgery informed that a new course on "Acupuncture" has been proposed to be introduced as a Diploma course with a duration of 6 months.
- The Members of the Council discussed on the above and it was suggested by the Chairman of the meeting that the eligibility for admission to the above course shall be for BDS students for the present.

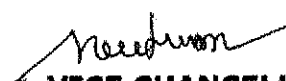
10. **A) To consider the introduction of the Course B.Voc – Rubber Technology in the Department of Chemical Engineering under the faculty of Engineering & Technology.**

B) To consider revamped 2018 Regulation curriculum and syllabus of B.Tech Chemical Engineering. (FT /PT)

**C) To consider revamped 2018 Regulation curriculum and syllabus of M.Tech Chemical Engineering. (FT)
M.Tech Petroleum Refining and Petro Chemicals (FT)**

- **A)** Dr. N. Jaya Chitra, HOD, Chemical Engineering, proposed to introduce the course of **B.Voc – Rubber Technology** under the faculty of Engineering and Technology.
- The Members of the Council accepted the proposal to introduce the new course **B.Voc – Rubber Technology** under faculty of **Engineering and Technology**. As the Members of the Council wanted to know on the practical components of the course, necessary clarifications were provided by the HOD. The council approved the same after the above clarification.
- **B)C)** The Members of the Council also approved the revamping of the curriculum & Syllabus under 2018 regulation relating to the following courses in Chemical Engineering.
 1. B.Tech Chemical Engineering. (FT /PT)
 2. M.Tech Chemical Engineering. (FT)
 3. M.Tech Petroleum Refining and Petro Chemicals (FT)

C.B. Palanisamy
REGISTRAR


VICE CHANCELLOR

9. To consider and approve Introduction of a new course Diploma in "Acupuncture" to be conducted by Thai Moogambigai Dental College & Hospital.

- Dr. R. Prabhakar, Dean Dental Surgery informed that a new course on "Acupuncture" has been proposed to be introduced as a Diploma course with a duration of 6 months.
- The Members of the Council discussed on the above and it was suggested by the Chairman of the meeting that the eligibility for admission to the above course shall be for BDS students for the present.

10. A) To consider the introduction of the Course B.Voc – Rubber Technology in the Department of Chemical Engineering under the faculty of Engineering & Technology.

B) To consider revamped 2018 Regulation curriculum and syllabus of B.Tech Chemical Engineering. (FT /PT)

**C) To consider revamped 2018 Regulation curriculum and syllabus of M.Tech Chemical Engineering. (FT)
M.Tech Petroleum Refining and Petro Chemicals (FT)**

- **A)** Dr. N. Jaya Chitra, HOD, Chemical Engineering, proposed to introduce the course of **B.Voc – Rubber Technology** under the faculty of Engineering and Technology.
- The Members of the Council accepted the proposal to introduce the new course **B.Voc – Rubber Technology** under faculty of **Engineering and Technology**. As the Members of the Council wanted to know on the practical components of the course, necessary clarifications were provided by the HOD. The council approved the same after the above clarification.
- **B)C)** The Members of the Council also approved the revamping of the curriculum & Syllabus under 2018 regulation relating to the following courses in Chemical Engineering.
 1. B.Tech Chemical Engineering. (FT /PT)
 2. M.Tech Chemical Engineering. (FT)
 3. M.Tech Petroleum Refining and Petro Chemicals (FT)

11. To consider the introduction of the following B.Sc. courses by the Department of Electronics and Communication Engineering under the faculty of Humanities & Sciences.

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1. **B.Sc – Embedded Systems**
2. **B.Sc – Network Security**
3. **B.Sc – Artificial Intelligence**
4. **B.Sc – Internet of Things (IoT)**
5. **B.Sc – Automation Technology**
6. **B.Sc – Digital Image Processing**
7. **B.Sc – Computing With Data Analytics**
8. **B.Sc – Very Large Scale Integration (VLSI)**
9. **B.Sc – Communication Systems with Business Management**

- Dr.N.Subashree, Dean (E&S) proposed the new courses to be started under the faculty of Humanities & Sciences.
- The Members of the Council suggested that after due verification on the availability of these nomenclatures in the UGC List by the HOD, the same could be taken as approved.

12. A) B) To consider revamped 2018 Regulation curriculum and syllabus of the following courses in the Department of Electronics and Communication Engineering.

- 1) **B.Tech- Electronics and Communication Engineering (FT/ PT)**
 - 2) **M.Tech - Applied Electronics Engineering (FT/PT)**
 - 3) **M.Tech - Communication System (FT /PT)**
 - 4) **M.Tech - VLSI & Embedded Systems (FT / PT)**
 - 5) **M.Tech - Wireless Communication (FT)**
 - 6) **M.Tech – Satellite Communication (FT)**
- The Members of the Council approved the revamping of Curriculum & Syllabus under 2018 regulation relating to the above courses as proposed by Dr. T. Godhavari, HoD, Electronics and Communication Engineering.

13. A) It has also been proposed to introduce and conduct the following Courses in the New Department "Department of Media Communications" under the faculty of Humanities & Sciences.

1. **B.Sc – Broadcast Media**
2. **B.Sc – Digital Media**
3. **B.Sc – Interactive Media**
4. **B.Sc – Electronics Media**
5. **B.Sc – Media and Communications**

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6. B.Sc – Mass Media.

- Dr.N.Subashree, Dean (E&S) proposed the new courses to be started under the faculty of Humanities & Sciences.
- The Members of the Council suggested that after due verification on the availability of these nomenclatures in the UGC List by the HOD, the same could be taken as approved.

13. B)Dr.N.Subashree, Dean (E&S), also proposed that in addition to the above degree courses, Certificate Courses also in the above streams could be started in the New Department of Media Communication.

- The Members of the Council approved the proposal to start the following Certificate Courses by the Department of Media Communication under the faculty of Humanities & Sciences.
 1. Diploma – Broadcast Media
 2. Diploma – Digital Media
 3. Diploma – Interactive Media
 4. Diploma – Electronics Media
 5. Diploma – Media and Communications
 6. Diploma – Mass Media.

14. To consider the introduction of the following B.Sc Courses by the Department of Electrical and Electronics Engineering under the faculty of Humanities & Sciences.

1. **B.Sc – Instrumentation Technology**
2. **B.Sc – Electronics & Instrumentation**
3. **B.Sc – Renewable Energy Technology**
4. **B.Sc – Process Control & Instrumentation**
5. **B.Sc – Power Electronics & Computer Science**
6. **B.Sc- Electrical Engineering & Information Science**
7. **B.Sc – Electronic Design & Computer Science**
8. **B.Sc – Medical Electronics**
9. **B.Sc – Industrial Electronics**
10. **B.Sc – Embedded Electronics & Computer Science**

- Dr.N.Subashree, Dean (E&S) proposed the new courses to be started under the faculty of Humanities & Sciences.

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- The Members of the Council suggested that after due verification on the availability of these nomenclatures in the UGC List, the same could be taken as approved.

15. A) To consider the introduction of the following B.Tech Course by the Department of Electrical and Electronics Engineering under the faculty of Engineering & Technology by Dr. Sheeba Percis - HoD.

B.Tech – Electrical Computer Engineering and Information Technology.

- The Members of the Council suggested to name the course as
" **B.Tech - Electrical and computer Engineering**" as per AICTE guide lines and approved the introduction.

15. B) Introduction of the following PG Diploma courses in the Department of Electrical and Electronics Engineering under the faculty of Engineering & Technology.

- 1. Energy Audit and Management**
- 2. Power Plant Operation and Maintenance**
- 3. Electrical Safety and Maintenance**

- Dr.E.Sheeba Percis ,HoD, Electrical and Electronics Engineering proposed new PG Diploma courses to be started under the faculty of Engineering and Technology.
- The Members of the Council approved to start P.G.Diploma Courses by department of Electrical and Electronics Engineering under the faculty of Engineering and Technology.
- Energy Audit and Management
 - Power Plant Operation and Maintenance
 - Electrical Safety and Maintenance

15. C) UG D) PG -To consider revamped 2018 Regulation curriculum and syllabus of the following courses in the Department of Electrical and Electronics Engineering

- 1. B.Tech- Electrical and Electronics Engineering (FT/ PT)**
- 2. B.Tech- Bio Medical Instrumentation (FT)**
- 3. B.Tech- Electronics and Instrumentation (FT)**
- 4. M.Tech – Bio Medical Instrumentation (FT)**

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5. M.Tech – Power Electronic and Drives (FT)

6. M.Tech – Power Systems (FT /PT)

- The Members of the Council also approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above courses as proposed by Dr. SheebaPercisHoD, Electrical and Electronics Engineering.

16. To consider the introduction of the following B.Sc&M.Sc courses in the New Department of Environmental Sciences under the faculty of Humanities & Sciences

1. B.Sc – Geology

2. B.Sc – Industrial Safety

3. B.Sc – Surveying and Spatial Science

4. B.Sc – Environmental Science and Water Resources

5. M. Sc – Real Estate Valuation

- Dr.N.Subashree, Dean (E&S) proposed the new courses to be started under the faculty of Humanities & Sciences.
- The Members of the Council approved to start **B.Sc Geology** by the Department of Civil Engineering under the faculty of Humanities and Science.
- The Members of the Council suggested that after due verification on the availability of these nomenclatures in the UGC List by the HOD, the same could be taken as approved.
 - 1. B.Sc – Industrial Safety
 - 2. B.Sc – Surveying and Spatial Science
 - 3. B.Sc – Environmental Science and Water Resources
 - 4. M.Sc – Real Estate Valuation

17. A) To consider the introduction of the following B.Tech Course in Civil Engineering Department under Engineering & Technology– proposed by Dr.K.Rathika – HOD.

B.Tech – IT Enabled Construction Technology and Management.

- The Members of the Council suggested to name the course as B.Tech. – Civil Engineering (Construction Technology and Management) as per AICTE guidelines and approved the course.

17. B) To consider revamped 2018 Regulation curriculum and syllabus of

1. B.Tech-Civil Engineering (FT /PT)

2. M.Tech – Remote Sensing (FT / PT)

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- 3. M.Tech – Structural Engineering (FT/ PT)**
- 4. M.Tech – Construction Engineering and Management (FT / PT)**
- 5. M.Tech – Transportation Engineering (FT / PT)**

- The Members of the Council also approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above courses as proposed by Dr. K. Rathika, HoD- Civil Engineering.

18. To consider the introduction of New Courses in the Academic Year 2019-20 in the Department of Mechanical Engineering by Dr. N. Ethiraj, Deputy Head.

A) B.Tech – Mechanical (Automobile)

B.Tech – Mechanical (Advanced Manufacturing)

B) M.Tech – Thermal Power Plant Engineering

C) PG Diploma

1. Thermal Power Plant Engineering

- Dr.N.Ethiraj, DeputyHoD, Mechanical Engineering proposed the new courses to be started under the faculty of Engineering and Technology.
- The Members of the Council approved to start the above mentioned new courses under the faculty of Engineering and Technology.

18. D) To consider revamped 2018 Regulation curriculum and syllabus of UG/PG courses by Dr.N.Ethiraj, Deputy Head.

• **B.Tech - Mechanical Engineering (FT /PT)**

B. Tech – Automobile Engineering (FT / PT)

• **M.Tech – CAD / CAM (FT/ PT)**

M.Tech – Design Engineering (FT/ PT)

M.Tech – Energy Engineering (FT/ PT)

M.Tech – Industrial Engineering (FT/ PT)

- The Members of the Council also approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above courses as proposed by Dr. N.Ethiraj, Deputy HoD, Mechanical Engineering.

19. A) To consider the implementation of revamped 2018 Regulations Curriculum and syllabus by the Department of Computer Science and Engineering under the faculty of Engineering and Technology by Dr.S. Geetha, HoD.

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1. **B.Tech – Computer Science and Engineering (FT /PT)**
B. Tech – Information Technology (FT)
B. Tech – Information Security and Digital Forensics (FT)
2. **M.Tech – Computer Science and Engineering (FT/ PT)**
M.Tech – Information Security and Cyber Forensics (FT)

- Dr.S.Geetha, HoD, Computer Science and Engineering proposed the above courses have been revamped as per 2018 Regulation curriculum and syllabus.
- The Members of the Council approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above courses as proposed by HoD, Computer Science and Engineering.

19. B) To consider the implementation of revamped 2018 Regulations curriculum and syllabus of M.Sc – Computer Science (FT) under Humanities & Sciences.

- Dr.N.Subashree, Dean(E&S), proposed the above course to be revamped as per 2018 Regulation curriculum and syllabus.
- The Members of the Council approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above course as proposed by Dr.N.Subashree, Dean(E&S), under the faculty of Humanities & Sciences.

20. A) To consider revamped 2018 Regulation curriculum and syllabus by the Department of BioTechnology under the faculty of Engineering and Technology by Dr.RajeshwariHari, HoD

1. **B.Tech – Bio Technology (FT)**
2. **M.Tech –Bio Technology (FT /PT)**
M.Tech – Medical Bio Technology (FT)
M.Tech – Energy and Environmental Technology (FT)

- Dr.RajeshwariHari, HoD, Bio Technology proposed the above courses to be revamped as per 2018 Regulation curriculum and syllabus.
- The Members of the Council approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above course as proposed by HoD, BioTechnology under the faculty of Engineering & Technology.

20. B) To consider revamped 2018 Regulation curriculum and syllabus of

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M.Sc. – Bio Technology (FT)

M.Sc. - Micro Biology (FT)

M.Sc.– Bio Informatics (FT)

- Dr.N.Subashree, Dean(E&S), proposed the above courses to be revamped as per 2018 Regulation curriculum and syllabus.
- The Members of the Council approved the revamping of the Curriculum & Syllabus under 2018 regulations relating to the above course as proposed by Dean(E&S) under the faculty of Humanities & Sciences

21. To consider the introduction of the following B.C.A ,B.Sc and M.Sc courses by Dr.N.Subashree, Dean(E&S) under Faculty of Humanities & Sciences.

- 1. BCA – Big Data Analytics**
- 2. BCA – Digital Technology**
- 3. B.Sc- Animation&Viscom**
- 4. B.Sc–Advanced Animation**
- 5. M.Sc – Animation &Viscom**

- Dr.N.Subashree, Dean(E&S) proposed the new courses to be started under Humanities & Sciences.
- The Members of the Council approved to start the above mentioned new courses under the faculty of Humanities & Sciences.

22. To consider the introduction of the following new BBA Courses under the Faculty of Humanities & Sciences.

- 1. BBA –CMA (Cost & Management Accounting) – 3 years**
- 2. BBA – FP (Financial Planning) – 3 years**
- 3. BBA – Business Analytics – 3 years**

- Dr.N.Subashree, Dean(E&S) proposed the new courses to be started under the Humanities & Sciences.
- The Members of the Council approved to start the above mentioned new courses under the Faculty of Humanities & Sciences.

23. To consider the introduction of the following new BBA and MBA Courses by the Department of Management Studies.

- 1. BBA FP + MBA FP (Financial Planning) – 5 years Integrated Course**

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- 2. BBA CMA + MBA CMA (Cost & Management Accounting) – 5 years Integrated Course**
- 3. MBA CMA (Cost & Management Accounting) – 2 years.**

- Dr. G. Brinda, HoD, Management Studies, proposed the new courses to be started under the Management Studies.
- The Members of the Council approved to start the above mentioned new courses under the Department of Management Studies.

24. To consider the introduction of the following B.COM and M.COM courses under the Department of Commerce.

- 1. B.Com – Financial Planning.**
- 2. B.Com – Cost & Management Accounting**
- 3. B.Com – International Accounting and Audit**
- 4. B.Com CMA + M.Com CMA (Cost & Management Accounting) (Integrated Course – 5 years).**
- 5. M.Com CMA (Cost & Management Accounting).**
- 6. M.Com (International Accounting and Audit)**

- Dr.C.B. Senthil Kumar, HoD, Commerce proposed the new courses to be started under the faculty of Humanities & Sciences.
- The Members of the Council approved to start the above mentioned new courses under the faculty of Humanities & Sciences.

25. To consider and approve the commencing of B.Sc Agriculture

- Dr. N.Subashree, Dean (E&S) informed that our University has proposed to introduce B.Sc Agriculture after obtaining the necessary Government approvals.
- The Members of the Council approved the above.

26. To consider and approve the commencing of B.Tech Agriculture

- Dr. S. Senthilvelan, Dean (E&T) informed that our University has proposed to introduce B.Tech Agriculture after following the necessary Government regulations.
- The Members of the Council approved the above.

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27. To consider the introduction of B.A Degree, Diploma and Certificate Courses in Bharathanatyam (In Association with Shobhana'sKalarpana Research Institute, Chennai).

- Dr. N.Subashree, Dean (E&S) informed that it has been proposed to introduce B.A Degree, Diploma and Certificate Courses in Bharathanatyam(In Association with Shobhana'sKalarpana Research Institute, Chennai).
- The above was approved by the Members of the Council.

**28. To consider the revision of syllabus for Business Taxation as per the New GST Act for the following courses.
B.Com – General/ B.Com – CS / B.Com – A&F / M.Com.–General**

- Dr. C.B. Senthil Kumar, HOD, Commerce informed that the syllabus for both UG and PG courses had been revised in order to include the changes as per the GST Act recently announced by Government of India.
B.Com – General / B.Com – CS / B.Com – A&F / M.Com.-General.
- The Members of the Council approved the above changes.

29. To consider the Increasing of Credits for MBA Program from 90 to102 Credits and to consider the Introduction of New Subjects / Electives.

- Dr.G. Brindha, HOD, Management Studies informed that the number of Credits have been suitably increased from 90 to 102 Credits in accordance with the recommendations of AICTE.
- It was also informed that the Department has introduced New Subjects / Electives for the benefit of the students.
- The Members of the Council approved the above changes.

30. To consider the introduction of M.Phil - English course the DepartmentofEnglish underHumanities & Sciences.

- Dr.R.Pushkala, HoD, Department of English proposedthe new course to be started under the faculty of Humanities & Sciences.

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- The Members of the Council has approved to start the above mentioned new course under the faculty of Humanities & Sciences.

31. To consider the introduction of Functional English for B.Sc –Psychology, B.Sc – Food Science, Nutrition & Dietetics and B.A – Economics.

- The Members of the Council accepted the proposal to Introduce Functional English Course Proposed by English Department only for B.Sc Food Science, Nutrition & Dietetics.
- For the B.Sc Psychology, B.A.Economics the Members of the Council suggested to follow the regular English syllabus as offered for the other 3 year degree courses.

32. To consider the introduction of Communicative French I & II (Theory) for B.A Economics, B.Sc.Psychology and B.Sc. Food Science, Nutrition & Dietetics.

- The Members of the Council accepted proposal to Introduce the Communicative French I & II (Theory) by French Department only for B.Sc Food Science, Nutrition & Dietetics.
- For the B.Sc Psychology, B.A.Economics the Members of the Council suggested to follow the regular French syllabus as offered for the other 3 year degree courses.

33. To consider the introduction of the following B.Sc courses by the Department of Mathematics under Humanities & Sciences.

- 1. B.Sc- Mathematics with Applied Statistics.**
- 2. B.Sc- Financial Mathematics**
- 3. B.Sc- Mathematics with Computer Applications.**
- 4. B.Sc- Mathematical Sciences.**

- Dr. T. Johnson, HoD, Department of Mathematics proposed the new courses to be started under the faculty of Humanities & Sciences.
- The Members of the Council approved to start the below mentioned new courses under the faculty of Humanities & Sciences.
 1. B.Sc- Mathematics with Applied Statistics.
 2. B.Sc- Financial Mathematics
 3. B.Sc- Mathematics with Computer Applications
- However the Members of the Council felt the proposal to start B.Sc Mathematical Science to be reconsidered.

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R. Sundaram

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34. To consider the introduction of M.Sc - Physics course by the Department of Physics under the faculty of Humanities & Sciences.

- Dr. S. Radha Krishnan, HoD, Department of Physics informed the introduction of M.Sc – Physics course from the Academic Year 2019-20.
- The Members of the Council approved the above .

35. A) To consider the introduction of New courses by the Department of Chemistry under the faculty of Humanities & Sciences.

- 1. B.Sc – Medicinal Chemistry**
- 2. B.Sc– Industrial Chemistry**

- The Members of the Council after necessary discussions approved the above courses with the condition that the degree will be offered under B.Sc Chemistry with the specialization programmes mentioned in brackets while issuing the respective Degree Certificates.

35. B) To consider the introduction of New courses by the Department of Chemistry under the faculty of Humanities & Sciences

1. M.Sc – Chemistry

- Dr. P. Udhayakala, HoD, Department of Chemistry proposed the above new course to be started under Humanities & Sciences.
- The Members of the Council approved to start the above mentioned new courses under Humanities & Sciences.

36. To consider the introduction of B.Sc, M.Sc & Diploma courses under the Department of Hotel Management, Culinary Arts & Aviation under the faculty of Humanities & Sciences.

- 1. B.Sc – Aviation Management**
- 2. M.Sc – Advanced Culinary Arts**

- Mr.M.Prabhu, HoD, Dean (De-nova Courses) proposed the above new courses to be started.
- The Members of the Council approved to start M.Sc Advanced Culinary Arts in the Department of Hotel Management and Catering Technology under the Faculty of Humanities & Sciences.

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- The Membres approved to start the B.Sc Aviation Management course as B.Sc Aviation Service Management under the faculty of Humanities & Sciences.

37. To consider the introduction of the following Diploma Course in Sales Management under the Department of Management Studies Diploma – Sales Management

- Mr.M.Prabhu, HoD, Dean (De-nova Courses) proposed the new course to be started under the faculty of Humanities & Sciences.
- The membres discussed and suggested that this Diploma Programme in Sales Management could be started under the Department of Management Studies.

38. To consider the introduction of B.Sc –Psychology under the faculty of Humanities & Sciences

- Mr.R. Manoj, HoD, Department of Psychology proposed the introduction of B.Sc – Psychology program.
- The above was approved by the Members of the Council.

39. To consider the introduction of B.A – Economics under the faculty of Humanities & Sciences

- Mr. A.V. Sekhar, HoD, Department of Economics informed the introduction of B.Sc – Economics under the faculty of Humanities & Sciences.
- The above was approved by the Members of the Council.

40. To consider the introduction of B.Sc – Food Science, Nutrition & Dietetics under the faculty of Humanities & Sciences.

- Ms. P.S. Prathibha, HOD, Department of Food Science, Nutrition & Dietetics proposed the introduction of B.Sc –Food Science, Nutrition & Dietetics.
- The above was approved by the Members of the Council to be started under the faculty of Humanities & Sciences.

41. To consider and approve the following resolution. As per the UGC announcement with regard to promotion of Academic Integrity and

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Prevention of Plagiarism in Higher Education Institutions the following requirement is to be followed with effect from July 2018.

To approve and resolve that "Compulsory Course Work on "Elements of responsible conduct of Research and Publication ethics" shall be prescribed for candidates in M.S (By Research) M.Phil and Ph.D. with effect from July 2018".

➤ Dr. A. Thirunavukarasu, Dean Research informed that UGC in its notification has instructed that in order to promote Academic Integrity and Prevention of Plagiarism in Higher Education Institutions, the following resolution could be approved "Compulsory Course Work on "Elements of responsible conduct of Research and Publication ethics" and prescribed for candidates in M.S (By Research) M.Phil and Ph.D. with effect from July 2018".

➤ The Members of the Council approved and passed the above Resolution.

42. To consider and note and approve the Separate Panel of Experts from Chennai as obtained from the Supervisors.

To approve and resolve that "A Separate Panel of Experts from Chennai shall be obtained from the Supervisor from which one shall be selected by the Vice-Chancellor for conduction the Ph.D. public Viva Voce Examination."

➤ Dr. A. Thirunavukarasu, Dean Research informed the following Resolution could be approved "A Separate Panel of Experts from Chennai shall be obtained from the Supervisor from which one shall be selected by the Vice-Chancellor for conduction the Ph.D. public Viva Voce Examination."

➤ The Members of the Council after discussing on this subject felt that it could be deferred.

43. To consider the introduction of B.P.E.S – Bachelor of Physical Education and Sports course under Humanities & Sciences.

➤ Dr. Vasudevan, HoD, Department of Physical Education proposed the introduction of B.P.E.S – Bachelor of Physical Education and Sports.

➤ The Council approved the introduction of the course.

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44. To note and consider the proposal to conduct special Supplementary Exams for the students who have exhausted the maximum number of attempts as permitted by the University and as per the Regulation 2005. UG (Full Time) / (Part Time) and PG (Full Time) / (Part Time).

- While considering the Proposal submitted by Dean Engineering & Technology, Dr. S. Sendilvelan to conduct special supplementary Exams for the Students who have completed their course of study but have not Passed so far in all the Subjects but exhausted the permitted time period, as proposed and approved in the XXV Academic Council, the Council now recommends

- 1) Students of 2009 & 2010 batch of UG Courses (Full Time and Part Time).
- 2) 2010 & 2011 batch UG Courses (Part Time Courses) and
- 3) Students of 2011 & 2012 batch of PG Courses

Will be given two final chances to appear for their arrear examinations, one during the November 2018 and another in the May 2019.

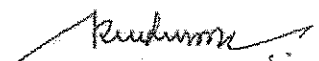
45. To take note of the recognition awarded to the University under the Graded Autonomy Status by UGC and MHRD

- The Registrar informed the members on the announcement made by the HRD Minister, New Delhi on 20th March 2018 with regard to having granted the Graded Autonomy Status to our Deemed to be University as well placing our Deemed to be University under Category-II. Our Deemed to be University is one amongst the 52 Universities in the country thus recognized and one amongst the 6 Universities in the State of Tamil Nadu. Of the 52 it was informed that 25 Universities have been placed under Category-I. The members while taking note of this recognition awarded by MHRD / UGC, New Delhi passed a resolution thanking the Minister HRD and UGC. The members also recorded and offered their appreciation to all the Executives, Faculties and Staff of the University in achieving this status.

46. To note and approve the recommendation of the Board of Management made in its 72nd meeting held on 27th April 2018 with regard to bringing of Raja Rajeswari Medical College and Hospital, Bengaluru under the AMBIT of our Deemed to be University and to approve the Curriculum and Syllabus as prescribed by Dr. M.G.R. Educational and Research Institute, Deemed to be University, Chennai.

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- The members noted that necessary action has been initiated in bringing of Raja Rajeswari Medical College and Hospital, Bengaluru under the AMBIT of our Deemed to be University. Currently as RajaRajeswari College and Hospital is affiliated to Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka they have been following the curriculum and syllabus as prescribed by the above University in lines with MCI Regulations. In the event RajaRajeswari Medical College and Hospital is brought under the AMBIT of our Deemed to be University, the college shall follow the curriculum and syllabus as may be prescribed by Dr.M.G.R. Educational and Research Institute, Deemed to be University which will be as per the MCI Regulations. In this regard those students who have joined up to the Academic Year 2018-19 shall follow the syllabus as prescribed by Rajiv Gandhi University of Health Sciences, Bengalure,Karnataka and those students joining after the Academic Year 2018-19 will follow the syllabus prescribed by Dr.M.G.R. Educational and Research Institute, Deemed to be University.

47. To discuss and approve the programmes and courses to be offered in the proposed off-campus centers and Distance Education Programmes.

- The members noted that our Deemed to be University has been since granted Graded Autonomy and classified under Category II. Hence our Deemed to be University shall be allowed to start Off-Campus centers.
- The members suggested that we could decide the programmes and courses after identifying the centers.

48. Any other matter.

1. Dr. C.V. Senthilnathan, Principal, Faculty of Physiotherapy informed that necessary revamping of the Question paper has been proposed and to provide choices for questions for all the existing and upcoming batches of all the four years of B.P.T. (copy enclosed)

- The Council discussed the changes informed by HOD, Physiotherapy and approved that the same could be made applicable to the students as suggested.

2. Dr. V.H. Hema, Principal, Faculty of Nursing proposed to start the Ph.D. Program in Nursing from the year 2018-19.

- The Members of the Council approved the same.

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C. B. Palaniyandi

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