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

20

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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 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 31stDecember 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 120working 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** -$2^{1}/2$ 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 ofstudy.

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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EDUCATIONAL AND RESEARCH INSTITUTE

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.physicianassistants are health care professionals who is 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, 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. 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 Hemoglobulin

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
  - αNaphthol

- **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
- Klinfelter 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
  - Neaubaur'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 conductingsystem 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 desending 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,Artifical Respiration.

Unit – VI Special sense and skin

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

Unit – VIIIReproductive system

- Malereproductive organs-Spermatogensis 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,
- Ttransamination,
- 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 diease
-Congenital heart diseae
-Valvular heart disease

2. RESPIRATORY SYSTEM
-Bronchial Asthma
-Emphysema
-Bronchiectasis

3. GIT
-Gastric ulcer
-Tumors of GIT

4. HEPATOBILIARY
-Hepatitis
-Liver Abscess
-Cirrhosis
-Cholecystits

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
-Rhematoid 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 -99mTc 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 mages 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 sytem - 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 microdiscectomy 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"ThirdEdition**.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.	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 Altas 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 reactionsBCG, 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, statusasthmaticus/ acute severe asthma, shock andanaphylaxis, burns, hypertensive emergencies, gastrointestinal bleed, comatose child, congestive cardiacfailure, 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 ,AravindBagga

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-PrimarySurvey,SecondarySurvey,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,Headtrauma,Musculoskeletaltrauma,Electricalinjuries,Thermalburns,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

- Augustecomte, 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 physiotheraphy ,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, workphysiology.

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 tuberculousmeningitis, brain abscess, tuberculoma
- CSF and its disturbances - cerebral odema, 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 ostructiveuropathy.
- 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 – Descripitive epidemiology – Analytical epidemiology -Cohort study – Expiremental epidemiology – RCT- Association & Caution 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 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 hygenic 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 StatisticsDefinition and Terms

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

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.

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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.
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