Dr.M.G.R.
Educational and Research Institute
(DEEMED TO BE UNIVERSITY)
(An ISO Certified Institution)
University with Graded Autonomy Status
Maduravoyal , Chennai - 600 095

FACULTY OF ALLIED HEALTH SCIENCES

B.Sc. Operation Theatre and Anaesthesia Technology

Regulation, Curriculum and Syllabus

2020

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

Introduction:

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

1. Short Title and Commencement:

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

2. Eligibility for Admission:

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

i) Physics, Chemistry, Biology (Eligible for all AHS courses)

ii) Physics, Chemistry, Botany and Zoology (Eligible for all AHS courses)

iii) Physics, Chemistry, Biology, biochemistry (Eligible for all AHS courses)

iv) Physics, Chemistry, Biology, nutrition dietetics (for B.Sc., Clinical nutrition only)

v) Physics, Chemistry, Mathematics (for B. Optometry only)

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

3. Age limit for admission

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

4. Eligibility Certificate

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

5. Registration

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

6. Duration of the course

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

7. Commencement of the Course:

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

8. Curriculum:

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

Academic Board from time to time.

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

- The first two semesters will be spent on Basic nutrition, Applied Microbiology, Family meal management, Clinical Nutrition, Advanced Nutrition, Physiology, Allied chemistry, Physics, English and Communication skills, Introduction to Computers, and Pharmacology.
- Specialized training in the concerned speciality will be offered during the third, fourth, fifth and sixth semesters.

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

9. Medium of Instruction:

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

10. Working Days:

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

11. Attendance:

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

12. Condonation of Lack of Attendance:

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University. Lack of attendance can be condoned up to a maximum of 10% of the minimum attendance required in the following exceptional circumstances:

(i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)

(ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)

(iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

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

13. Commencement of the examinations

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

14. Continuous (Internal) Assessment:

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

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

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

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

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

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

EXAMINATION PATTERN-

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

THEORY

MARKS- 60 Marks

DURATION -$2^{1}/2$ 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

Theory 20 Marks
Practical 5 Marks

TOTAL **100 Marks**

SEMESTER III – SEMESTER VI

Duration -3hours

Theory **80 marks**

Section –A (Answer any TWO from THREE)
1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)
1. Short notes (8x5=40)

Section-C
1.Very short notes (5x2=10)

Internal assessment
Based on CAT Exams (I, II, III & Model) **20 marks**

TOTAL **100 Marks**

Practicals Pattern
80 marks

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

Internal assessment **20 marks**

- Attendance
- Based on CAT exams
- Log book

TOTAL **100 Marks**

17. Marks Qualifying for a Pass:

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

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

18. Classification of successful candidates:

a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, and project/dissertation evaluation shall alone be awarded Distinction. This will also apply for award of University rank.

b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project/dissertation evaluation and viva shall be awarded First Class.

c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

19. Revaluation of answer papers

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

20. Carry- over of failed subjects

1) A candidate has to pass in theory and practical examinations separately in each of the paper.

2) If the candidate fails either in theory or practical examinations, he/she has to reappear for both (theory and practical)

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

21. Temporary break of study

a) A candidate is not normally permitted to temporarily break the study.

b) If a candidate is continuously absent from the institute for four or more weeks,

   i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as "Temporary Break of Study".

   ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.

c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.

d) For condonable break of study:

   i) If the lack of attendance is within condonable limits as per Clause No. 12, the candidate shall be permitted to write the examination for the current semester.

   ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.

e) The total period for completion of the program reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No.6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.

f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The

candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.

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

Dr. M.G.R.

EDUCATIONAL AND RESEARCH INSTITUTE

UNIVERSITY

(Declared u/s.3 of the UGC Act, 1956)

FACULTY OF ALLIED HEALTH SCIENCES

SCHEME OF EXAMINATION

SEMESTER – I **TOTAL HOURS : 330**

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Theory	Practical	Theory	Practical	

1	Anatomy -I(UE)	40 hours	20 hours	20	5	60	15	100
2	Physiology -I(UE)	40 hours	20 hours	20	5	60	15	100
3	Biochemistry -I(UE)	40 hours	20 hours	20	5	60	15	100
4	Microbiology -I(UE)	40 hours	20 hours	20	5	60	15	100
5	Pathology -I(UE)	40 hours	20 hours	20	5	60	15	100
6	English(IE)	30 hours	-	-	-	50	-	50

UE - University Exam
IE- Internal Exam

SEMESTER – II

TOTAL HOURS : 420

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

UE - University Exam
IE- Internal Exam

SEMESTER – III (OT AND ANAESTHESIA TECHNOLOGY)

TOTALHOURS: 420

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Theory	Practical	Theory	Practical	
1	Anatomy & Physiology related to Anesthesia Technology -Theory(UE)	60 hours	-	20	-	80	-	100
2	Anatomy& Physiology related to Anesthesia Technology Practical (UE)		120 hours	-	20		80	100
3	Applied Pharmacology and Microbiology related to Anesthesia Technology-Theory(UE)	60 hours	-	20	-	80	-	100
4	Applied Pharmacology and Microbiology related to Anesthesia Technology-Practical(UE)		120 hours	-	20	-	80	100
5	Medical Ethics and Bio safety (IE)	30 hours	-	-	-	50	-	50
6	Psychology (IE)	30 hours	-	-	-	50	-	50

UE - University Exam
IE- Internal Exam

SEMESTER – IV (OT AND ANAESTHESIA TECHNOLOGY)

HOURS:420

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Theory	Practical	Theory	Practical	
1	Principles Of Anesthesia - I Theory(UE)	60 hours	-	20	-	80	-	100
2	Principles Of Anesthesia - I Practical(UE)	-	120 hours	-	20	-	80	100
3	Principles Of Anesthesia - II Theory(UE))	60 hours	-	20	-	80	-	100
4	Principles Of Anesthesia -II Practical(UE)	-	120 hours		20	-	80	100
5	Basics and Advanced Life support(IE)	30 hours	-	-	-	50	-	50
6	Sociology(IE)	30 hours	-	-	-	50	-	50

UE - University Exam
IE- Internal Exam

SEMESTER – V (OT AND ANAESTHESIA TECHNOLOGY)

HOURS: 450

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Theory	Practical	Theory	Practical	
1	Principles Of Sterilization Techniques-Theory(UE)	60 hours	-	20	-	80	-	100
2	Principles Of Sterilization Techniques-Practical(UE)	-	120 hours	-	20	-	80	100
3	Anesthesia Techniques Including Complications-Theory(UE)	60 hours	-	20	-	80	-	100
4	Anesthesia Techniques Including Complications-Practical(UE)	-	120 hours	-	20	-	80	100
5	Environmental Science and Community medicine(IE)	30 hours	-	-	-	50	-	50
6	Biostatistics and Research Methodology (IE)	30 hours	-	-	-	50	-	50
7	Basic Nutrition (Elective)/Advanced Diagnostic Techniques (Elective)(IE)	30 hours	-	-	-	50	-	50

UE - University Exam
IE- Internal Exam

SEMESTER – VI (OT AND ANAESTHESIA TECHNOLOGY)

HOURS: 420

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Theory	Practical	Theory	Practical	
1	Anesthesia for specialties (including critical care assistance and ventilation) paper – I Theory(UE)	60 hours	-	20 hours	-	80	-	100
2	Anesthesia for specialties (including critical care assistance and ventilation) paper – I Practical(UE)	-	120 hours	-	20 hours	-	80	100
3	Anesthesia for specialties (including critical care assistance and ventilation) paper – II Theory(UE)	60 hours	-	20 hours	-	80	-	100
4	Anesthesia for specialties (including critical care assistance and ventilation) paper – II-Practical(UE)	-	120 hours	-	20 hours	-	80	100
5	Healthcare and basic Principles(IE)	30 hours	-	-	-	50	-	50
6	**Hospital Management /Applied clinical research (elective)(IE)**	30 hours	-	-	-	50	-	50

SEMESTER – VII (OT AND ANAESTHESIA TECHNOLOGY)

Project/Dissertation

S.No.	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		Total
				Project	Viva	Project	Viva	
1.	Project/ Dissertation (UE)	-	-	100	-	100	-	200

SEMESTER – VII &VIII (OT AND ANAESTHESIA TECHNOLOGY)

Internship -1 YEAR

SEMESTER - I

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

SEMESTER - I

ANATOMY – I (UE)

Objectives:

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

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

Learning Objectives: Skills

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

CONTENTS

Unit I

Organization of the Human Body

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

Cell

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

Tissues

- Tissues of the body
- Definition and types of basic tissues

- Characteristics, functions and locations of different types of tissues

Unit II

Systems of Support and Movement

1. Skeletal system

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

2. Muscular system

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

1. **Histology** – Epithelium
2. **Axial & Appendicular Skeleton** With Names & Number Of Bones
3. **Muscles**

a. Trapezius
b. Lattisimus dorsi
c. Biceps
d. Triceps
e. Deltoid

4. **Nervous System**

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

5. **Special Senses**

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

6. **Viva Voce**

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

Recommended books:

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

References:

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

PHYSIOLOGY-I (UE)

Objectives of the course:

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

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

CONTENTS

Unit 1

General Physiology

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

Nerve and muscle

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

Blood and body fluids

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

Unit II

Digestive system

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

Excretory system

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

PRACTICAL & VIVA VOICE

- Microscope
- Estimation of Hemoglobulin
- RBC
- WBC
- Spotters

Recommended book

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

Reference books

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

BIOCHEMISTRY-I (UE)

Objectives:

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

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

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

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

Metabolism of Carbohydrates :

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

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

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

Metabolism of Lipids :

- Digestion and Absorption of lipids,
- Fatty acid synthesis & Steps of β oxidation of fatty acids,

- Types and functions of lipoprotein,
- Lipid profile, hyper cholesterolemia

Unit III - VITAMINS

Vitamins:

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

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

  Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOICE

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

SPOTTERS

- **CRYSTALS**
  - Maltosazone
  - Lactosazone
  - Glucosazone/Fructosazone

- **REAGENTS**
  - Benedict's reagent
  - Barfoeds reagent
  - Foulgers reagent
  - Seliwanoff reagent
  - Fouchets reagent
- **CHEMICALS**
  - Sodium Acetate
  - Phenyl hydrazine
  - α Naphthol
- **STRUCTURES.**
  - Structure of Cholesterol
  - Structure of Glucose
  - Structure of Fructose
- **VITAMINS**
  - Carrots
  - Rickets
  - Scurvy
  - Egg

Text books Recommended :

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

Reference books :

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

MICROBIOLOGY – I (UE)

OBJECTIVE:

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

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

Contents

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

Unit II:

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

Unit III

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

PRACTICAL & VIVA VOICE

1. **Gram staining**
2. **Spotters:**
   - Disposable syringe
   - Sterile cotton swab
   - Bacteriological loop
   - Sterile tube
   - McIntosh fildes Jar

- Autoclave
- Nutrient Agar plate
- Mac Conkey agar plate
- Mac conkey with LF
- Mac conkey with NLF
- Blood agar plate
- L J Media
- RCM
- BHI broth
- Antibiotic susceptibility test
- Gram Positive Cocci in Clusters
- Gram negative bacilli
- AFB
- VDRL Slide
- Microtitre plate

RECOMMENDED BOOK:

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

REFERENCE BOOKS:

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

PRACTICAL BOOK:

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

PATHOLOGY-I (UE)

Objective:

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

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

Contents

Unit-I. Introduction to cell

- Normal Cell Structure Function

Unit-II.Cell injury and Adaptation

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

Unit-III.Inflammation and Repair

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

Unit-IV.Hemodynamic Disorder

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

Unit-V.Infectious Disease

- Tuberculosis-Etiology, predisposing factors, primary & secondary tuberculosis and complications

- Leprosy-Etiology, classification, Lepromatous and tuberculoid leprosy

Unit-VI.Neoplasia

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

Unit-VII.Genetics

- Down syndrome
- Klinfelter syndrome
- Turner syndrome

Unit-VIII. Radiation

- Effects of Radiation

PRACTICAL & VIVA VOICE

- **DIFFERENTIAL COUNT**
  - Spotter
- **GROSS (SPOTTER)**
  - Fatty liver
  - Lipoma
  - Dry gangrene foot
  - Wet gangrene bowel
  - CVC Spleen
  - Hydatid cyst
  - TB – Lung
- **INSTRUMENTS**
  - Westergrens ESR tube
  - Sahlihemocytometer
  - Neaubaur's chamber
  - Bone Marrow Needle

Recommended Textbook:

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

Reference book:

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

ENGLISH (IE)

General objectives:

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

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

Unit I: Grammar

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

Unit II. Vocabulary

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

Unit III. Oral communication

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

Unit IV. Spoken English

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

Unit V. Written communication

(a) Art of writing

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

(b) Letter writing

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

(c) Report writing

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

(d) Note making and Note taking

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

(e) Comprehension

- Listening and reading comprehension

(Exercise of prescribed short answers)

Unit VI. Reading

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

Reference Books:

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

SEMESTER-II

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

SEMESTER II

ANATOMY – II (UE)

Objectives:

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

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

Unit I

Maintenance of the Human Body

a) Cardio-vascular system

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

b) Lymphatic system

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

c) Respiratory system

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

Unit II

a) Digestive system

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

b) Urinary system

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

Unit III

a) Reproductive system

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

b) Anatomical Regions

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

PRACTICAL & VIVA VOICE SYLLABUS

- **Endocrine System**
  - Pituitary gland
  - Pineal body
  - Thyroid & parathyroid gland
  - Adrenal
  - Pancreas
  - Gonads – Ovary & Testis
- **Cardio-Vascular System**
  - Heart
- **Lymphatic system**
  - Spleen
- **Respiratory System**
  - Lungs
  - Larynx
  - Trachea
- **Digestive System**
  - Salivary glands
  - Esophagus
  - Pharynx
  - Stomach
  - Liver, Gall bladder
  - Duodenum
  - Small intestine
  - Large intestine

- **Urinary system**
  - Kidneys
  - Ureter
  - Urinary bladder
- **Reproductive System**
  - Sagittal section – Male & Female pelvis
  - Uterus & ligaments
  - Ovary
  - Prostate
  - Seminal vesicles
  - Vas deferens
  - Testis
- **Viva Voce**
  - Radiology – Xrays
  - Osteology
  - Charts
  - Models

Recommended books:

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

References:

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

PHYSIOLOGY-II (UE)

Objectives:

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

Unit I Cardiovascular System

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

Unit -II Nervous system

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

Unit -III Respiratory system

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

Unit – IV Special sense and skin

- Vision,
- Audition,
- Olfaction,

- Gustation.

Unit – V Reproductive system

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

Unit – VI Endocrine system

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

PRACTICAL & VIVA VOICE SYLLABUS

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

Recommended book

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

Reference books

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

BIOCHEMISTRY – II (UE)

Objectives:

At the end of the semester the students should be able

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

Unit I - PROTEINS

Proteins :

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

Metabolism of Proteins :

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

Unit II -- NUCLEIC ACIDS

Nucleic acids:

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

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

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

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOICE

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

Spotters

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

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

Text books Recommended:

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

Reference books:

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

MICROBIOLOGY – II (UE)

OBJECTIVE:

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

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

Unit-I

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

Unit - II

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

Unit - III

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

Unit - IV

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

PRACTICAL & VIVA VOICE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia

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

II. Clinical case discussion with charts

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

RECOMMENDED BOOK:

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

REFERENCE BOOKS:

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

PRACTICAL BOOK:

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

PATHOLOGY- II (UE)

UNIT-1: CARDIOVASCULAR SYSTEM

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

- Atherosclerosis- Definition, Etiopathogenesis, Morphology and Complications

UNIT-2: RESPIRATORY SYSTEM

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

UNIT-3: GASTROINTESTINAL SYSTEM

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

UNIT-4: HEPATOBILIARY SYSTEM

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

UNIT-5: RENAL AND URINARY SYSTEM

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

UNIT-6: REPRODUCTIVE SYSTEM

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

UNIT-7: CENTRAL NERVOUS SYSTEM

- Infection
- Meningitis- Definition, Causes and CSF Findings

UNIT-8: DISEASES OF BONES & JOINTS

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

UNIT-9: ANEMIA

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

UNIT-10: AUTOIMMUNE DISEASES

- Definition and Names of common autoimmune diseases

PRACTICAL & VIVA VOICE

INSTRUMENT TEST

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

SPECIMEN

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

Recommended Textbook:

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

Reference book:

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

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

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

Unit I: Introduction

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

Pharmacokinetics-

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

Unit II

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

Unit III:

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

Unit IV

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

Unit V

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

Unit VI

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

Recommended books:

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

Reference books:

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

PRACTICAL & VIVA VOICE

Learning Objective

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

- Instruments
- Needles
    - Intravenous
    - Intrathecal
    - Spinal
    - Intra arterial
- Syringes:
    - Tuberculin
    - Insulin
    - I.V cannula
    - Scalp. Vein set
- Students Discussion
    - Enema can
    - Inhalers
    - Spacers
    - Nebulizers
- Tablets –
    - Enteric coated,
    - Sustained release,
    - Sub-lingual
- Students Discussion
    - Capsules
    - Spansules
    - Pessary

- Suppository
- Topical Preparation
- Ointment,
- Lotion,
- Powder,
- Drops – eye / ear

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

Text books suggested for reading:

- Text book of pharmacology for Dental &Allied Health Science 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 (IE)

Unit 1: Basic concepts

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

Unit 2: Electromagnetic induction

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

Unit 3: Laser

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

Applications of laser in Medicine- Laser hazards and safety measures.

Unit 4: Radiation Physics

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

Unit 5: Introduction to Imaging Technique

Principles of Microscope: Simple microscope and compound microscope - Radiography**:** Making an X-ray image –Fluoroscopy-. CT Scans, MRI - Ultrasonography: Ultrasound picture of Body-A-Scan-B-Scan-M-Scan-Ultrasound diathermy-Phonocardiography - Radio isotopes: Uses of radio isotopes -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 Bio potential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalography – Electromyography.

Recommended books:

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

COMPUTER SCIENCE (IE)

Unit-I. History of computers,

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

Unit-II. System:

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

Unit-III. Office application suite

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

Unit-IV. Language

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

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

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

Practicals:

1. Various browsers, search engines, email
2. Text document with 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 allied health sciences

Text Books:

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

Reference Books:

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

Semester-III

S.No:	Subject
1.	ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY-THEORY(UE)
2	ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY - PRACTICAL (UE)
3	APPLIED PHARMACOLOGY AND MICROBIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY-THEORY(UE)
4	APPLIED PHARMACOLOGY AND MICROBIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY -PRACTICAL(UE)
5	MEDICAL ETHICS AND BIOSAFETY (IE)
6	PSYCHOLOGY (IE)

SEMESTER-III

ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY-THEORY (UE)

OBJECTIVE

- Expected to have basic knowledge on human anatomy and physiology
- To develop in depth knowledge on anatomy of various organs and structures
- To develop exhaustive ideology of various functions of various structures.

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UNIT – I

Respiratory System- Structure and function of the respiratory tract in relation to anaesthesia - Nose, Pharynx, Larynx, Trachea & Bronchial tree – vessels, nerve supply, respiratory tract. Respiratory Physiology-Respiratory muscles – diaphragm, intercostals, Lung volumes-dead space, vital capacity, FRC .Oxygen: properties, storage, supply, hypoxia

UNIT II

Cardiovascular System - Anatomy – Chambers of the heart, circulation, ECG, Blood Pressure. How to measure? Hypotension & Hypertension

UNIT – III

Fluids And Electrolytes/ Blood Transfusion-Body Fluids – Composition, I.V Fluids – composition & administration, I.V Cannulation, Blood grouping, Cross matching, Transfusion indications, hazards.

UNIT – IV

Nervous System- Parts of Central & Peripheral Nervous System, Cerebro spinal fluid

UNIT – V

Reproductive System: Physiological changes in pregnancy and labour

Reference:

Text Books: 1. Human Anatomy ,B.D.Chaurasia, Vol 1, 2, 3, Sixth edition, CBS Publishers & Distributors, 2013 2.
Textbook of physiology : A.K.Jain, Fifth edition, Avichal Publishing Company , 2014

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding.
- Will be able to provide better support during surgery.

ANATOMY & PHYSIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY-PRACTICAL (UE)

OBJECTIVE

- Expected to have basic knowledge on human anatomy and physiology
- To develop in depth knowledge on anatomy of various organs and structures
- To develop exhaustive ideology of various functions of various structures.

PRACTICALS/ DEMONSTRATIONS

1. Model of respiratory tract
2. Spotters –pictures in anatomy and physiology of various systems
3. How to measure blood pressure
4. How to set up things for IV cannulation

Specific Learning Outcome (SLO):

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain to physiological processes with understanding.
- Will be gaining hand on training in setting up things for IVcannulation.

APPLIED PHARMACOLOGY AND MICROBIOLOGY RELATED TO ANAESTHESIA TECHNOLOGY-THEORY (UE)

Objectives:

- Expected to have basic knowledge on anatomy, physiology and pharmacology.
- To develop knowledge on various drugs and their mechanism of actions.
- To impart knowledge on the adverse effects on various drugs.

APPLIED PHARMACOLOGY

UNIT-I

- **ANTISIALAGOGUES**

  Atropine, Glycophyrrolate
- **SEDATIVES I ANXIOLYTICS**

  Diazepam, Midazolam, Phenergan, Lorazepam, Chloropromazine,Trichlopho
- **NARCOTICS**

  Morphine, Pethidine, Fentanyl, Pentazozine
- **ANTIEMETICS**

  Metaoclopramide,Ondanseteron, Dexamethasone
- **ANTACIDS**

  Na citrate, Gelusil, Mucaine gel.

UNIT-II

- **H2 BLOCKERS**

Cimetidine, Ranitidine, Famotidine

- **INDUCTION AGENT**

Thiopentone , Diazepam, Midazolam, Ketamine, Propofol, Etomidate.

- **MUSCLE RELAXANTS**

Depolarising - Suxamethonium,
Non depolar:sing -Pancuronium, Vecuronium, Atracurium, rocuranium

- **INHALATIONAL GASES**

Gases - 02, N20, Air
Agents - Ether-, Halothane, Isofllurane, Saevoflurane, Desflurane

- **REVERSAL AGENTS**

Neostigmine, Glycopyrrolate, Atropine,
Nalorphine, Naloxone, Flumazenil (Diazepam)

- **LOCAL ANAESTHETICS**

Xylocaine, Preparation, Local – Bupivacaine - Topical,
Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine

UNIT-III

- **EMERGENCY DRUGS**
  - Adrenaline : Mode or administration, dilution, dosage,
  - Effects, Isoprenaline
  - Atropine, bicarbonate, calcium, ephedrine, xylocard,
  - Ionotropes : dopamine, dobutamine, amidaron
  - Aminophylline, hydrocortisone, antihistamlnics, potassium.
  - Cardiovascular drugs
  - Antihypertensives
  - Antiarhythmics
  - Beta - Blockers
  - Ca - Channel blockers.
  - Vasodilators - nitroglycerin & sodium nitroprusside
  - Respiratory system - Bronchodilators, respiratory stimulants Broncholytic agents
  - Renal system - Diuretics,furosemide,mannitol
  - Obstetrics - oxoytocin,methergin
  - Miscellaneous - Antibiotics NSAIDS Anticoagulants and Insulin

APPLIED MICROBIOLOGY

UNIT-IV

- Sterilization &decontamination-I Dry
- Filtration
- Wound Infection & Urinary Tract Infections
- Blood stream Infections
- Respiratory tract Infection
- S.Typhi, Salmonel1a Paratyphi 'A', Salmonella Typhimurium
- Catheter, IV associated Infections
- Hospital acquired infections & prevention of hospital acquired infections
- Hepatitis C, HBV, HIV
- Hyper sensitivity reaction – Type I, II, III, IV

Text Books:

1. Pharmacology for Dental and AlliedHealth Sciences, Padmaja Udaykumar, Third Edition, Jaypee Brothers Medical Publishers ,2013

Reference Books:

1.Essentials of medical pharmacology, Tripathi, 7th edition, Jaypee Brothers Medical Publishers,2013

Specific Learning Outcome (SLO):

- Gain knowledge on the mechanism of actions of various drugs along with their adverse effects.
- Able to identify the drug to be used in emergency situations during a surgica lprocedure.
- Gain knowledge on various NSAIDs and anticoagulants.

APPLIED PHARMACOLOGY AND MICROBIOLOGY REALTED TO ANAESTHESIA TECHNOLOGY-PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anatomy, physiology and pharmacology.
- To develop knowledge on various drugs and their mechanism of actions.
- To impart knowledge on the adverse effects on various drugs.

PRACTICALS/ DEMONSTRATIONS

- Spotters
- Charts
- Anesthetic induction agents
- Inhalation agents

Specific Learning Outcome (SLO):

- Gain knowledge on the mechanism of actions of various drugs along with their adverse effects.
- Able to identify the drug to be used in emergency situations during a surgical procedure.
- Gain knowledge on various NSAIDs and anticoagulants.

PSYCHOLOGY (IE)

Unit I

Basic concepts of Psychology

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

Unit II

Social Psychology

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

Unit III

Hereditary and environment

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

Unit IV

Learning principles and methods

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

Unit V

Motivation , Emotion, Memory and forgetting

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

Unit VI

Intelligence & Personality

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

Unit VII

Health Psychology

- Meaning of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology
- Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness,

neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

- Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

REFERENCES:

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

MEDICAL ETHICS AND BIOSAFETY (IE)

1. Definition & key terms – ethics Vs law

2. Define Negligence, Malpractice & Liability

3. Influence of Ethics on general practice

4. Professional codes of Ethics

5. Describe primary & Secondary Ethical principles

6. Describe the Moral basis of Informed consent & advance directives

7. Euthanasia and physician – assisted suicide

8. Physicians, patients and other: autonomy, Truth Telling & Confidentiality

9. Reproductive control: Assisted reproduction and Ethics

10. Workers compensation

11. Ethical issues in applied medicine

12. Fertility & Birth control

13. Genetic testing genetic screening.

14. Research Ethics

SEMESTER-IV

S.No:	Subject
1.	PRINCIPLES OF ANAESTHESIA - I -THEORY (UE)
2	PRINCIPLES OF ANAESTHESIA - I -PRACTICAL(UE)
3	PRINCIPLES OF ANAESTHESIA - II -THEORY (UE)
4	PRINCIPLES OF ANAESTHESIA - II -PRACTICAL (UE)
5	BASICS AND ADVANCED LIFE SUPPORT (IE)
6	SOCIOLOGY (IE)

SEMESTER-IV

PRINCIPLES OF ANAESTHESIA-I THEORY (UE)

Objective:

- Expected to have basic knowledge on basic medical sciences
- To develop ideology of various Equipment used in anaesthesia technology.
- To develop knowledge on the principles involved in OT and OT techniques.

Specific Learning Outcome (SLO):

- Gain knowledge on various codes and safety devices.
- Learn the importance of endotracheal tubes and laryngoscopes in anaesthesia.
- Learn about the machines and gain knowledge on OT and OT techniques.

UNIT-I

MEDICAL GAS SUPPLY

- Compressed gas cylinders
- Colour coding

- Cylinder valves; pin index.
- Gas piping system
- Recommendations for piping system
- Alarms & safety devices.

UNIT-II

ANAESTHESIA MACHINE

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator
- Flow meter assembly
- Vaporizers - types, hazards, maintenance, filling and draining, etc
- Machine check

BREATHING SYSTEM

- General considerations: humidity & heat
- Common components - connectors, adaptors, reservoir bags
- Methods of humidification.
- Classification of breathing system Mapleson system – a, b, c, d, e, f ,Jackson Rees system, Bain circuit
- Non rebreathing valves - ambu valves
- The circle system Components Soda lime, indicators

UNIT-III

AIRWAY EQUIPMENTS

- FACE MASK: Types, Sizes, Advantage, Disadvantage
- LARYNGOSCOPY: Types, sizes, advantage, disadvantage
- ENDOTRACHEAL TUBES - Types, sizes. Insertion technique, advantage and disadvantage
- BASIC AIRWAY ADJUCANTS : Oropharyngeal airway & Nasopharyngeal airway
- Bougie, stylet
- LMA

UNIT-IV

- ANESTHESIA VENTILATOR: Introduction, types of ventilator, modes of ventilator & ventilator settings

UNIT-V

MONITORING

- ECG
- Sp02
- ETCO2
- Temperature
- IBP
- CVP
- PA Pressure
- Bio Medical engineering of Trouble sorting Management, care of cleaning

Text Books:

1. The Anaesthesia Technician and Technologist's Manual, Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana, 1st edition, Lippincott Williams & Wilkins, 2012

Reference Books:

1. Anesthésia Equipment, Principles and Applications (Expert Consult: Online and Print),2: Anesthésia Equipment Clinical Key 2012

PRINCIPLES OF ANAESTHESIA-I PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on basic medical sciences
- To develop in depth knowledge on concepts of pathological conditions.
- To develop exhaustive ideology of techniques in regional and general anaesthesia

Specific Learning Outcome (SLO):

- Gain knowledge on various codes and safety devices.
- Learn the importance of endotracheal tubes and laryngoscopes in anaesthesia.
- Learn about the machines and gain knowledge on OT and OT techniques

PRACTICALS/ DEMONSTRATION:

1. Cylinders,
2. Suction apparatus,
3. Endotracheal tubes,
4. Laryngoscopes,
5. LMA,
6. Oropharyngeal airway, Nasopharyngeal airway
7. Anaesthesia machine- description, parts, safety features

PRINCIPLES OF ANAESTHESIA- II THEORY (UE)

Objective:

- Expected to have basic knowledge on basic medical sciences
- To develop in depth knowledge on concepts of pathological conditions.
- To develop exhaustive ideology of techniques in regional and general anaesthesia

Specific Learning Outcome (SLO):

- Gain knowledge on history of anaesthesia, pre and post - operative assessment.
- Learn the investigations and pre-anesthetic orders required for patient to be anesthetized.
- Gain knowledge on the management of complications and anesthetic considerations.

UNIT-I

INTRODUCTION TO ANAESTHESIA

History- First successful clinical demonstration: Modern anaesthetic era – Balanced anaesthesia, Minimum standard of anaesthesia, Who should give anaesthesia,Ten golden rules of anaesthesia,Different Types of Anaesthesia – General Anaesthesia ,Regional Anaesthesia ,Local Anaesthesia
Minimum standard of anesthesia

PRE-OP ASSESSMENT

- Pre anesthetic assessment~ History - disease / Surgery / and personal history - Smoking / alcohol
- Airway examination: Lemon scoring, mallampatti classification, thyromental distance,
- General physical assessment , systemic examination – CVS, RS, CNS
- Case acceptance: ASA grading - I, II, III, IV. V

UNIT-II

INVESTIGATIONS

Routine – Urine
Complete Blood Count
- E.C.G.
- Chest X – ray
- Others

PRE - ANAESTHETIC ORDERS:

- Patient – Informed concern
  - NPO guidelines

- Premedication - advantages, drugs used
- Special instructions - if any
- Preoperative checklist

UNIT-III

INTRAOPERATIVE MANAGEMENT

Confirm the identification of the patient,Noninvasive & Invasive monitoring,Positioning of the patient,Induction - drugs used,Endotracheal intubation,Maintenance of anesthesia,Maintenance of Blood / fluid & electrolyte balance,Reversal from anesthesia - drugs used,Transfering the patient

UNIT-IV

POST OPERATIVE COMPLICATIONS & MANAGEMENT

Recovery room - Set up ,Things needed, Problems, Complications ,Obesity, Anaemia Nausea&vomiting,Sorethroat,Laryngealgranuloma,Neurologicalcomplications,Awareness,Vascularcomplic ations,Traumato teeth, Headache, Backache, Ocular complications, Auditory complications,Mortality, Causes of death, Cerebral damage, Prevention

UNIT V

Anaesthetic consideration in- Cardiac disease-CAD, Valvular heart disease, congenital heart disease, Hypertension, Respiratory disease- COPD, Bronchial Asthma, Endocrine disease- DM, Thyroid dysfunction, Renal disease- CRF, Obesity

Text Books:

1. The Anaesthesia Technician and Technologist's Manual, Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana, 1st edition, Lippincott Williams & Wilkins, 2012

Reference Books:

Anaesthesia Equipment, Principles and Applications (Expert Consult: Online and Print),2: Anaesthesia Equipment Clinical Key 2012

PRINCIPLES OF ANAESTHESIA- II PRACTICAL (UE)

Objective:

- Expected to have knowledge on basic medical Sciences
- To develope knowledge on the principles of sterilization.
- To impart the techniques involved in sterilization in relation to anaesthesia

Specific Learning Outcome (SLO):.

- Learn the preparation of OT based of the type of patients and methods of sterilization.
- Gain knowledge on various positions in surgery.
- Gain knowledge on disinfectants and their importance.

PRACTICALS/ DEMONSTRATIONS

Checking the machine

- O_2, N_2O, suction apparatus
- Laryngoscopes, Endotracheal tubes, airways
- IV cannulation
- Other monitoring systems
- Case acceptance: ASA grading - I, II, III, IV. V

BASIC AND ADVANCED LIFE SUPPORT(IE)

Unit-I: TRAUMA LIFE-Part 1

- BLS,TRIAGE-Primary Survey,Secondary Survey,Airway &Ventilatory management ,Shock,Central & peripheral venous access,Thoracic trauma – Tension pneumothorax,Other thoracic injuries Abdominal trauma – Blunt injuries Abdominal trauma – Penetrating injuries.

Unit-II: TRAUMA LIFE-Part 2

- Spine and spinal cord trauma,Head trauma,Musculoskeletal trauma,Electrical injuries,Thermal burns,Cold injury.

Unit-II: TRAUMA LIFE-Part 3

- Pediatric trauma, Trauma in pregnant women, Workshop BLS, Workshop cervical spine immobilization, Imaging studies in trauma.

Unit-III: BASIC CARDIAC LIFE SUPPORT

- BLS, The universal algorithm for adult ECC, Ventricular fibrillation/Pulseless ventricular tachycardia algorithm, Pulseless electrical activity (PEA) / asystole algorithm, Bradycardia treatment algorithm, Tachycardia Treatment algorithm.

Unit-IV: ADVANCED CARDIAC LIFE SUPPORT

- Hypotension/Shock, Acute myocardial infarction, Pediatrics Advanced life support,Defibrillation,Drugs used in ACLS,Emergency cardiac pacing,AED,Techniques for oxygenation and ventilation.

Text Books:

1. Handbook of Emergency Medicine, Suresh S. David, 8th edition, Elsevier, 2012

Reference Books:

1. Emergency Medicine, S. N. Chugh, 4th edition, CBS publishers, 2014

SOCIOLOGY (IE)

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

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

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

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

Unit 3:CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Auguste comte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

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

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system

Reference:

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

SEMESTER- V

S.NO:	SUBJECT
1.	PRINCIPLES OF STERILIZATION TECHNIQUES- THEORY (UE)
2	PRINCIPLES OF STERILIZATION TECHNIQUES- PRACTICAL (UE)
3	ANAESTHESIA TECHNIQUES INCLUDING COMPLICATIONS- THEORY (UE)
4	ANAESTHESIA TECHNIQUES INCLUDING COMPLICATIONS - PRACTICAL (UE)
5	ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE (IE)
6	BIOSTATISTICS AND RESEARCH METHODOLOGY (IE)
7	BASIC NUTRITION /ADVANCED DIAGNOSED TECHNIQUE (ELECTIVE) (IE)

SEMESTER-V

PRINCIPLES OF STERILIZATION TECHNIQUES-THEORY (UE)

Objectives:

- Expected to have knowledge on basic medical Sciences
- To develop knowledge on the principles of sterilization.
- To impart the techniques involved in sterilization in relation to anaesthesia

Specific Learning Outcome (SLO):

- Gain knowledge on the design of operation theatres.
- Learn the preparation of OT based of the type of patients and methods of sterilization.
- Gain knowledge on the care and maintenance of operation records in OT.

UNIT – I

Layout of OT and Lighting of OT

UNIT II

- Cleanliness and sterilization of OT and Anaesthesia Carbolization, fumigation, principles of sterilization – autoclaving, pressure sterilization, boiling, dry heat, gas chemical sterilization, gamma rays sterilization Sterilization &decontamination-I Dry,Filtration **INFECTION-** Wound Infection & Urinary Tract Infections, Catheter, IV associated Infections,Hospital acquired infections & prevention of hospital acquired infections

UNIT – III

Preparation of patients for various types of anesthesia including laying out of trolleys, preparation of Boyle's apparatus for administration of anesthesia, precaution to reduce antistatic friction hazards, preparation of sterile field , special precautions in handling patients with sepsis, blood borne infections – Hepatitis B, HCV, HIV, etc, Cleaning and Disinfection of articles, Segregation of Biomedical waste management and OT various positions during surgeries - lithotomy/kidney/beach chair/lateral/prone

UNIT – IV

Electrical and fire hazards- Prevention of physical, electrical, chemical injuries and hazards to patients OT pollution and scavenging

UNIT – V

Care and Maintenance of Operation records of OT- Maintenance of septic OT, Use and maintenance of defibrillator, cautery, OT light, suction, emergency light etc., Admission and transfer procedures

Text Books:

1. Principles and Methods of Sterilization in Health Sciences, John J. Perkins, 2nd edition, Charles C Thomas Pub Limited, 1983

Reference Books:

Fundamentals of Surgical Practice, Aljafri A. Majid, Andrew N. Kingsnorth, 1st edition, Cambridge University Press, 1998

PRINCIPLES OF STERILIZATION TECHNIQUES-PRACTICAL (UE)

Objectives:

- Expected to have knowledge on basic medical Sciences
- To develop knowledge on the principles of sterilization. in relation to anaesthesia
- To impart the techniques involved in sterilization.

Specific Learning Outcome (SLO):

- Learn the preparation of OT based of the type of patients and methods of sterilization.
- Gain knowledge on various positions in surgery.
- Gain knowledge on disinfectants and their importance

PRACTICALS/ DEMONSTRATIONS

1. Disinfectants
2. Methods of sterilization
3. Various positions in surgery

ANAESTHESIA TECHNIQUES INCLUDING COMPLICATIONS – THEORY (UE)

Objective:

- Expected to have basic knowledge on anatomy, physiology, pathology and pharmacology.
- To develop in depth knowledge on anaesthesia techniques for various procedures.
- To develop exhaustive ideology of the complications associated with various anaesthesia techniques.

Specific Learning Outcome (SLO):

- Gain knowledge on the setup of required Equipment for anaesthesia.
- Gain knowledge on monitoring and diagnostic procedures for anaesthesia.
- Learn the general idea on the care of patients for various procedures.

UNIT – 1

- To setup the required equipments for general anesthesia, spinal, epidural, nerve block .

UNIT II

- Monitoring during anesthesia and complications.

UNIT – III

- Monitoring and Diagnostic Procedure in ICU ,OT Setup for Invasive monitoring:- pressure transducer setup, Arterial tray setup, Assisting technique for CVP and PA cauterization

UNIT – IV

- General care of patient in ICU-Eye, GI tract, Bladder, skin, Case of mechanically ventilated patient, Tracheotomy, humidification, Vascular lines – arterial, venous line, Radiography, Physiotherapy – chest physiotherapy

UNIT – V

- **Regional anesthesia**-Introduction, Types, Indication, Contraindication, Procedure, Complications and Management

Text Books:

1. **Regional Anaesthesia And Pain Management**: Current Perspectives, Dureja, 3rd edition, Elsevier India, 2007

Reference Books

1. Clinical Anaesthesia, Paul G. Barash, 6th edition, Lippincott Williams & Wilkins, 2009

ANAESTHESIA TECHNIQUES INCLUDING COMPLICATIONS – PRACTICAL (UE)

Objective:

- Expected to have basic knowledge on anatomy, physiology, pathology and pharmacology.
- To develop in depth knowledge on anesthésia techniques for various procedures.
- To develop exhaustive ideology of the complications associated with various anaesthesia techniques.

Specific Learning Outcome (SLO):

- Gain knowledge on the setup of required Equipment for anesthésia.
- Gain knowledge on monitoring and diagnostic procédures for anesthésia.
- Learn the general idea on the care of patients for various procédures.

PRACTICALS/ DEMONSTRATIONS

1. Monitoring during anaesthesia and post-operative period
2. General care of patient in ICU
3. How to assist anesthetist for central venous cannulation

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

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

- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in The Ecosystem

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

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

- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, Rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust.

- **Concept of health &disease**: Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation –Natural history of Disease- Iceberg Phenomenon, Concept of control- Concept of Prevention- Modes of Intervention, Changing pattern of disease.

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

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

Air pollution & its effects. Prevention & Control of air pollution
Ventilation: Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excreta disposal

BIOSTATISTICS & RESEARCH METHODOLGY (IE)

INTRODUCTION

What is statistics – Importance of statistics in behavioral sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioral sciences. Measurements – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales. Cumulative frequency curve – Drawing inference from graph. Measures of central tendency – Need – types: Mean, Median, Mode – Working out these measures with illustrations. Measures of variability – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation. Normal distribution – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

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

RESEARCH METHODS:

Research Meaning- Scope and Objectives –.Research methods vs. Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, concept of applied and basic research process, criteria of good research. Defining and formulating the research problem, selecting the problem, necessity of defining the problem, importance of literature review in defining a problem, literature review-primary and secondary sources, reviews, monograph, patents, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis

DATA COLLECTION AND SAMPLING:

Data collection – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram. Accepts of method validation, observation and collection of data, methods of data collection, sampling methods, data processing and analysis strategies and tools,data analysis with statically package (Sigma STAT,SPSS for student t-test, ANOVA, etc.), hypothesis testing.Correlation – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

Tests of significance- need for – significance of the mean – sampling error – significance of

differences between means – interpretation of probability levels – small samples – large samples.

BASIC NUTRITION (ELECTIVE) (IE)

UNIT 1 - NUTRITIONAL ASSESSMENT

Nutritional anthropometric measurements , Nutritional biochemical assessment, Clinical signs & symptoms,Dietary assessment

UNIT 2 - NUTRITION THROUGH LIFE CYCLE

Diet during infancy, Diet during preschool, Diet during school, Diet during adolescence, Diet during adulthood, Diet during geriatrics, Diet during special needs- Pregnancy and lactation

UNIT 3 - THERAPEUTIC NUTRITION 1

Dietary management in underweight, Dietary management in obesity, Dietary management in diabetes, Dietary management in hypertension.

UNIT 4 - THERAPEUTIC NUTRITION 2

Dietary management in cardiovascular diseases, Dietary management in renal diseases, Dietary management in cancer

ADVANCED DIAGNOSTIC TECHNIQUES(ELECTIVE) (IE)

Unit I

Volumetric analysis, Balancing & Weighing, Concept of solute & solvent, Units of measurement. Specimen Collection & Processing: Specimen collection (Blood, urine, spinal fluid, saliva synovial fluid, Amniotic fluid), Preservation, transportation

Unit II

Clinical Enzymology: Principle of diagnostic enzymology, Digestive enzyme, miscellaneous enzyme. General Function Tests: Liver function test, Cardiac Function Test, Renal Function Test, Thyroid Function test, Reproductive endocrine function test

Unit III

Immunodiagnostics: Introduction, Antigen-Antibody Reactions, Conjugation Techniques, Antibody Production, Enzymes and Signal Amplification Systems, Separation and Solid-Phase Systems, Studies related to bacterial, viral and parasitic infections.

Unit IV

Product Development: Immunoassay Classification and Commercial Technologies, Assay Development, Evaluation, and Validation, Reagent Formulations and Shelf Life Evaluation, Data Analysis, Documentation, Registration, and Diagnostics Start-Ups.

Unit V

DNA based diagnostics: PCR, RFLP, SSCP, Microarrays, FISH, In-situ hybridization, Studies related to bacterial, viral and parasitic infections, Cell based diagnostics: Antibody markers, CD Markers, FACS, HLA typing, Bioassays.

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Semester- VI

S.No:	Subject
1.	ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – I- THEORY (UE)
2	ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – I- PRACTICAL (UE)
3	ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – II- THEORY (UE)
4	ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – II-PRACTICAL(UE)
5	HEALTHCARE AND BASIC PRINCIPLES(IE)
6	HOSPITAL MANAGEMENT /APPLIED CLINICAL RESEARCH (ELECTIVE) (IE)

SEMESTER-VI

ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – I THEORY (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles
- To develop knowledge on anaesthetic techniques for Cardiac and Neuro anaesthesia.
- To develop knowledge on anaesthesia for shock and trauma.

Specific Learning Outcome (SLO):

- Gain knowledge on cardiac anaesthesia including monitoring setup and management.
- Learn the signs of raised ICT and induction of patient and positioning for Neuro Anaesthesia.
- Gain knowledge on anaesthetic management and rapid sequence induction for trauma and Shock.

UNIT – 1

Cardiac anesthesia –PART 1 NYHA classification, Arrhythmias, Angina, Dyspnoea,- Cardiac surgery : Introduction, Types of surgery ,Types of procedure,CPB,Components of CPB ,weaning of CPB,One Lung Ventilation Tube

UNIT II

Cardiac anesthesia –PART 2, Premedication ,Induction of cardiac patient, precautions to be taken in cardiac patients, Equipments used in cardiac OT, Cardiac Monitoring (Invasive and Non-Invasive), IABP, ICU management - Chest Tube.

UNIT – III

Neuro Anesthesia- Neuro Surgery – Introduction, Craniotomy,Cranioplasty, Glasgow coma scale, Signs of raised ICT, Premedication ,Check list ,Induction of a patient Positioning in Neuro surgery, I.C.P monitoring , Air embolism, Transferring to I.C.U / ward

UNIT – IV

Anesthesia for Trauma & Shock Resuscitation, Different types of Shock and its management Pre-op investigation /assessment, Circulatory management, Management of anesthesia, Rapid sequence intubation, other problems.

UNIT – V

CPR- BLS, ACLS

Text Books:

1. Nurse Anaesthesia, John J. Nagelhout, Karen L. Plaus, 5th edition, Elsevier Health Sciences, 2014

Reference Books:

1. Basics of Anaesthesia, Ronald D. Miller, Manuel Pardo, 6th edition, Elsevier Health Sciences, 201

ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE

ASSISTANCE AND VENTILATION) PAPER – I PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.
- To develope knowledge on anaesthetic techniques for cardiac and Neuro anaesthesia.
- To develope knowledge on anaesthesia for shock and trauma.

Specific Learning Outcome (SLO):

- Gain knowledge on cardiac anaesthesia including monitoring setup and management.
- Learn the signs of raised ICT and induction of patient and positioning for neuro-anasesthesia.

Gain knowledge on BLS chain of survival

PRACTICALS/ DEMONSTRATIONS

1. Spotters –basic anaesthetic considerations in cardiac and neuro surgery
2. Charts- BLS chain of survival
3. Demonstration- transferring of post-operative patient to ICU

ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION) PAPER – II THEORY (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.
  - To develop knowledge on anaesthetic techniques for obstetric and pediatric anaesthesia.
- To develop knowledge on anaesthesia outside the O.R.

Specific Learning Outcome (SLO):

- Gain knowledge on obstetric anaesthesia including precautions, induction, reversal and emergencies.
- Learn the theatre setting, monitoring and pain management for pediatric anaesthesia..
- Gain knowledge on situations, natural calamities and complications of anaesthesia outside the O.R.

UNIT-I

Obstetric Anaesthesia (Part 1)- Physiological changes during Pregnancy , Precautions to be taken ,Risk of Anaesthesia, Check list, Regional vs general anaesthesia, Induction maintenance

UNIT-II

Obstetric Anaesthesia (Part 2)- Resuscitation of the new born, APGAR score, Reversal and extubation, Emergencies – Manual removal of placenta, A.P.H,- P.P.H., Ruptured uterus, Ectopic pregnancy, Labour, Epidural analgesia

UNIT-III

Paediatric Anaesthesia – Theatre preparation, Intubation Tray preparation, Check list, Premedication ,Induction, Intubations-securing the ETT, Monitoring, Reversal & extubation – problems, Transferring / ICU management, Pain management.

UNIT-IV

Day Care Anaesthesia - Special features, procedures, Equipments, Advantages, Disadvantages, Complications.

UNIT-V

Anaesthesia Outside the O.R- Cath lab- Diagnostic Procedures, , Radiology and Imaging Science Technology, Electrocovulsant Therapy-Features, Safety Measures, Shortcomings, Complications,

Text Books:

1. Nurse Anaesthesia, John J. Nagelhout, Karen L. Plaus, 5th edition, Elsevier Health Sciences, 2014

Reference Books:

1. Basics of Anaesthesia, Ronald D. Miller, Manuel Pardo, 6th edition, Elsevier Health Sciences, 2011

ANAESTHESIA FOR SPECIALITIES (INCLUDING CRITICAL CARE ASSISTANCE AND VENTILATION)PAPER – II PRACTICAL (UE)

Objectives:

- Expected to have basic knowledge on anaesthesia techniques and principles.

  · To develop knowledge on anaesthetic techniques for obstetric and paediatric anaesthesia.
- To develop knowledge on anaesthesia outside the O.R.

Specific Learning Outcome (SLO):

· Gain knowledge on obstetric anaesthesia including precautions, induction, reversal and emergencies.

· Learn the theatre setting, monitoring and pain management for paediatric anaesthesia..

· Gain knowledge on situations, natural calamities and complications of anaesthesia outside the O.R.

PRACTICALS/DEMONSTRATIONS

1) Spotters –common obstetric emergencies

2) Charts- situations requiring anaesthesia outside operation theatre

3) Demonstration of adult and Paediatric anaesthetic protocols

HEALTH CARE AND BASIC PRINCIPLES (IE)

1. Concept of Health Care and Health Policy

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

2. Health Organization

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

3. Health Policy and National Health Programme

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

4. Health Economics

Fundamentals of Economics

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

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

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

7. Economics of Health

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

8.Health Insurance

HOSPITAL MANAGEMENT (ELECTIVE)(IE)

Objectives:

- To promote awareness of health care among all sections of the Indian people
- To promote awareness among functionaries involved in Health and Hospital Management.
- To promote research in the field of Health and Hospital Management. in order to improve the efficiency of Health Care delivery Systems.
- To promote the development of high quality hospital services and community health care.
- To promote a forum for the exchange of ideas and information among health and hospital planners, academicians, administrators, various statutory bodies and the general public for the improvement of Hospital and Health Care delivery Systems
- **To develop norms and standards for accreditation of the Health Care Organization and adopt means of evaluation of such institutions, so as to improve the quality of health care in the community**
- To provide opportunities for training and research in all aspects of Hospital Services Health Care Delivery System and Health Care Administration.
- To update the knowledge and skill of the Health & Hospital Administrators and other personnel involved in the management of health care organization through continuous education and research.

UNIT – I

Introduction to Management: Introduction, concept, Characteristics and nature, scope, Principles of Management, Functions and techniques.

UNIT II

Planning: Principles, Characteristics, Essential of good planning, advantages and limitations, Classifications.

UNIT – III

Staffing: Importance, Norms and activities, PCS, Types of PCS, Duty Roaster.

Human resource management: HR planning, Recruitment, selection process, Placement, Orientation of new staff and training, Staff development , staff promotion.

UNIT – IV

Budgetting and material management: Purpose, Types,Principles, Function, cost benefit analysis, Auditing.

Principles of MM, process, supply and equipment, Inventory control, Procurement.

UNIT- V

Controlling-Quality management: Essential of effective control system, Importance of controlling, TQM. Hospital and patient care, ward management. Legal Issues.

UNIT - VI

Staff development and welfare:

Importance of staff development, Training Vs Education, Function. Staff welfare. Inservice education, Continuing education and career Opportunities-Component, manager role.

APPLIED CLINICAL RESEARCH (ELECTIVE)(IE)

UNIT I: Introduction to clinical research

Basic pharmacology and drug development process, clinical research definition, Basic terminology used in clinical research, preclinical studies, Introduction to pharmacoeconomics, Types of clinical trials Good Clinical Practices, and Scope of Clinical Research.

UNIT II: Clinical trials

New drug discovery process- purpose, main steps involved in new drug discovery process, timelines of each steps, advantages and purposes of each steps, Pre clinical toxicology: General principles, Systemic toxicology ,animal toxicity requirements, Phase-I, II, III, IV trials: Introduction and designing, Various phases of clinical trials, Termination of trial, Safety monitoring in clinical trials

UNIT III: Ethics & Regulations in Clinical research

Ethical Theories and Foundations, Ethics Review Committee and Informed Consent Process, Integrity & Misconduct in Clinical Research Clinical Trial Application in India Import & Export of Drug in India , Investigational New Drug application (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA), Post Drug Approval Activities, PMS, FDA Audits and Inspections EU Regulatory Affairs

UNIT IV: Principles of controlled clinical trials

Clinical trial design (observational and interventional) protocol, consent in clinical trials, placebo, bias and methods to prevent bias, ethics in clinical trials, monitoring, problems and solutions of controlled clinical trials.

UNIT V: Biostatistics and data management

Preparation of a successful clinical study, Study management, Project management Documentation, Monitoring, Audits and Inspections Pharmacovigilance Training in clinical research Budgeting in clinical research, Supplies and vendor management**.**

Semester VII

S.No:	Subject
1.	Project/ Dissertation