



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

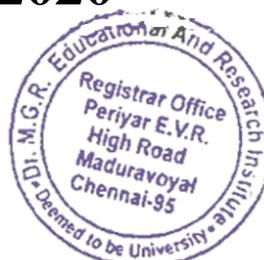


FACULTY OF ALLIED HEALTH SCIENCE

B.Sc., Respiratory Care Technology

Regulations, Curriculum and Syllabus

2020



C. B. Palanivelu

REGISTRAR
Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University)
Periyar E.V.R. High Road,
Maduravoyal, Chennai 600 095

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 31stDecember 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 specialty 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 -2¹/2 Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

Theory 20 Marks

Practical 5 Marks

TOTAL -----
100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory **80 marks**

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1. Very short notes (5x2=10)

Internal assessment

Based on CAT Exams (I,II,III& Model)

20 marks

TOTAL

100 Marks

Practicals Pattern

80 marks

1. Spotters 20 marks
2. Viva (Theory & Practical) 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
FACULTY OF ALLIED HEALTH SCIENCES
SCHEME OF EXAMINATION

SEMESTER-I

TOTALHOURS: 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)	40hours	20hours	20	5	60	15	100
2	Physiology-II (UE)	40hours	20hours	20	5	60	15	100
3	Biochemistry-II (UE)	40hours	20hours	20	5	60	15	100
4	Microbiology-II (UE)	40hours	20hours	20	5	60	15	100
5	Pathology-II (UE)	40hours	20hours	20	5	60	15	100
6	Pharmacology (UE)	40hours	20hours	20	5	60	15	100
7	Physics (IE)	30hours	-	-	-	50	-	50
8	Computer Science (IE)	30hours	-	-	-	50	-	50

UE - University Exam

IE- Internal Exam

SEMESTER–III (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS: 420

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

UE - University Exam

IE- Internal Exam

SEMESTER-IV (RESPIRATORY CARE TECHNOLOGY)

TOTALHOURS :420

S.No	Paper	Hours/Semester		Evaluation(Marks)				Total
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		
				Theory	Practical	Theory	Practical	
1	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I-Theory(UE)	60hours	-	20	-	80	-	100
2	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I-practical(UE)	-	120 hours	-	20	-	80	100
3	Concepts of disease and outlines of clinical evaluation related to respiratory Care technology paper-II-theory(UE)	60hours	-	20	-	80	-	100
4	Concepts of disease and outlines of clinical evaluation related to respiratory Care technology paper-II-practical(UE)	-	120 hours	-	20	-	80	100
5	Basics and advanced life support(IE)	30hours	-	-	-	50	-	50
6	Sociology(IE)	30hours	-	-	-	50	-	50

UE - University Exam

IE- Internal Exam

SEMESTER-V (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 450

S.No	Paper	Hours/Semester		Evaluation(Marks)				
		Theory	Practical	ContinuousAssessment(Internals)		End Semester examination(University/Department Exams)		Total
				Theory	Practical	Theory	Practical	
1	Respiratory care technology Part I– Paper I–Theory(UE)	60hours	-	20	-	80	-	100
2	Respiratory care technology Part I– Paper I–Practical(UE)	-	120hours	-	20	-	80	100
3	Respiratory care technology Part I– Paper II–Theory(UE)	60hours	-	20	-	80	-	100
4	Respiratory care technology Part I– Paper II–Practical(UE)	-	120hours	-	20	-	80	100
5	Environmental science and Community medicine–Theory(IE)	30hours	-	-	-	50	-	50
6.	Bio-Statistics and Research Methodology (IE)	30	!	!	!	50	!	50
7.	Basic Nutrition (Elective) / Advanced Diagnostic technique (Elective) (IE)	30	!	!	!	50	!	50

UE - University Exam

IE- Internal Exam

SEMESTER-VI (RESPIRATORY CARE 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	Respiratory care technology Part II- Paper- I–Theory(UE)	60hours	-	20	-	80	-	100
2	Respiratory care technology Part II- Paper- I–Practical(UE)	-	120hours	-	20	-	80	100
3	Respiratory care technology Part II- Paper-II–Theory(UE)	60hours	-	20	-	80	-	100
4	Respiratory care technology Part II- Paper-II–Practical(UE)	-	120hours	-	20	-	80	100
5	Healthcare and basic principles (IE)	30hours	-	-	-	50	-	50
6.	Hospital Management/ Applied clinical research (Elective) (IE)	30hours	-	-	-	50	-	50

UE - University Exam

IE- Internal Exam

SEMESTER– VII (FOR ALL SPECIALITIES)

Project/Dissertation

S.No	Paper	Hours/Semester		Evaluation(Marks)				Total
		Theory	Practical	Continuous assessment (Internals)		End Semester Examination		
				Project	Viva	Project	Viva	
1.	Project/Dissertation(UE)	-	-	100	-	100	-	200

SEMESTER–VII &VIII (FOR ALL SPECIALITIES)

Internship - 1 year

SEMESTER - I

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

SEMESTER - I
ANATOMY – I (UE)

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

Objectives of the course:

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

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

CONTENTS

Unit 1

General Physiology

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

Nerve and muscle

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

Blood and body fluids

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

Unit II

Digestive system

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

Excretory system

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

PRACTICAL & VIVA VOICE

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

Recommended book

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

Reference books

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

BIOCHEMISTRY-I (UE)

Objectives:

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

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

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

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

Metabolism of Carbohydrates :

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

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

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

Metabolism of Lipids :

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

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

Unit III - VITAMINS

Vitamins:

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

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOICE

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

SPOTTERS

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

- **REAGENTS**

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

- **CHEMICALS**

- Sodium Acetate
- Phenyl hydrazine
- α Naphthol

- **STRUCTURES.**

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

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

Text books Recommended :

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

Reference books :

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

MICROBIOLOGY – I (UE)

OBJECTIVE:

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

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

Contents

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

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

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

PRACTICAL & VIVA VOICE

1. Gram staining

2. Spotters:

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

RECOMMENDED BOOK:

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

REFERENCE BOOKS:

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

PRACTICAL BOOK:

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

PATHOLOGY-I (UE)

Objective:

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

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

Contents

Unit-I. Introduction to cell

- Normal Cell Structure Function

Unit-II. Cell injury and Adaptation

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

Unit-III. Inflammation and Repair

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

Unit-IV. Hemodynamic Disorder

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

Unit-V. Infectious Disease

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

Unit-VI. Neoplasia

- Definition, Nomenclature & Classification

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

Unit-VII.Genetics

- Down syndrome
- Klinefelter syndrome
- Turner syndrome

Unit-VIII. Radiation

- Effects of Radiation

PRACTICAL & VIVA VOICE

- **DIFFERENTIAL COUNT**

- Spotter

- **GROSS (SPOTTER)**

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

- **INSTRUMENTS**

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

Recommended Textbook:

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

Reference book:

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

ENGLISH (IE)

General objectives:

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

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

Unit I: Grammar

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

Unit II. Vocabulary

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

Unit III. Oral communication

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

Unit IV. Spoken English

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

Unit V. Written communication

(a) Art of writing

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

(b) Letter writing

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

(c) Report writing

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

(d) Note making and Note taking

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

(e) Comprehension

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

Unit VI. Reading

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

Reference Books:

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

SEMESTER-II

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

SEMESTER II
ANATOMY – II (UE)

Objectives:

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

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

Unit I

Maintenance of the Human Body

a) Cardio-vascular system

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

b) Lymphatic system

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

c) Respiratory system

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

Unit II

a) Digestive system

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

b) Urinary system

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

Unit III

a) Reproductive system

- Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis

and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary
vagina vulva and breast.

b) Anatomical Regions

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

PRACTICAL & VIVA VOICE 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 effectively communicate terms related to physiology of various body systems
- To identify and describe physiological functions of various structures involved in smooth functioning of the body.

Unit I Cardiovascular System

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

Unit -II Nervous system

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

Unit -III Respiratory system

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

Unit – IV Special sense and skin

- Vision,
- Audition,

- Olfaction,
- Gustation.

Unit – V Reproductive system

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

Unit – VI Endocrine system

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

PRACTICAL & VIVA VOICE SYLLABUS

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

Recommended book

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

Reference books

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

BIOCHEMISTRY – II (UE)

Objectives:

At the end of the semester the students should be able

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

Unit I - PROTEINS

Proteins :

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

Metabolism of Proteins :

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

Unit II -- NUCLEIC ACIDS

Nucleic acids:

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

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

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

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOICE

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

Spotters

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

1. Urinometer
2. Lactometer
3. Centrifuge
4. Spectroscope
5. Colorimeter
6. pH meter
7. Ryles' Tube
8. Chromatography apparatus

9. Electrophoresis apparatus
10. Micropipette
11. Fluorosis
12. Inborn Errors of Metabolism
13. Protein Energy Malnutrition
14. Benzidine powder
15. Sulphur powder
16. Fouchet's Reagent
17. Structure of t RNA
18. Egg White
19. Jaundice
20. Gout

Text books Recommended:

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

Reference books:

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

MICROBIOLOGY – II (UE)

OBJECTIVE:

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

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

Unit-I

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

Unit - II

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

Unit - III

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

Unit - IV

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

PRACTICAL & VIVA VOICE

I.SPOTTERS

1. Ascaris lumbricoides
2. Taenia
3. Gram stained smears showing Candida

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

II. Clinical case discussion with charts

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

RECOMMENDED BOOK:

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

REFERENCE BOOKS:

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

PRACTICAL BOOK:

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

PATHOLOGY- II (UE)

UNIT-1: CARDIOVASCULAR SYSTEM

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

UNIT-2: RESPIRATORY SYSTEM

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

UNIT-3: GASTROINTESTINAL SYSTEM

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

UNIT-4: HEPATOBILIARY SYSTEM

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

UNIT-5: RENAL AND URINARY SYSTEM

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

UNIT-6: REPRODUCTIVE SYSTEM

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

UNIT-7: CENTRAL NERVOUS SYSTEM

- Infection
- Meningitis- Definition, Causes and CSF Findings

UNIT-8: DISEASES OF BONES & JOINTS

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

UNIT-9: ANEMIA

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

UNIT-10: AUTOIMMUNE DISEASES

- Definition and Names of common autoimmune diseases

PRACTICAL & VIVA VOICE

INSTRUMENT TEST

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

SPECIMEN

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

Recommended Textbook:

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

Reference book:

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

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

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

Unit I: Introduction

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

Unit II

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

Unit III:

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

Unit IV

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

Unit V

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

Unit VI

- Hormones & related Drugs, Drugs used in Gastrointestinal diseases & Miscellaneous drugs

- Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhoea and Treatment of peptic ulcer
- Vitamins, Vaccines, Sera and chelating agents.

Recommended books:

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

Reference books:

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

PRACTICAL & VIVA VOICE

Learning Objective

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

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

- Suppository
- Topical Preparation
- Ointment,
- Lotion,
- Powder,
- Drops – eye / ear
- Charts:
 - Mechanism of action of drugs, adverse effects, toxicology
- Spotters:
 - drugs

Text books suggested for reading:

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

PHYSICS (IE)

Unit 1: Basic concepts

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

Unit 2: Electromagnetic induction

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

Unit 3: Laser

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

Unit 4: Radiation Physics

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

Unit 5: Introduction to Imaging Technique

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

Unit 6: Semiconductor devices

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

Unit 7: Biopotential Recording Systems

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

Recommended books:

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

Computer Science (IE)

Unit-I. History of computers:

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

Unit-II. System:

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

Unit-III. Office application suite

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

Unit-IV. Language

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

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

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

Practicals:

1. Various browsers, search engines, email
2. Text document with 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	Applied Anatomy, Physiology related to Respiratory care technology-Theory(UE)
2	Applied Anatomy, Physiology related to Respiratory care technology-Practical(UE)
3	Pharmacology related to Respiratory care technology-Theory(UE)
4	Pharmacology related to Respiratory care technology-Practical(UE)
5	Medical Ethics and Biosafety(IE)
6	Psychology(IE)

SEMESTER III

APPLIED ANATOMY AND PHYSIOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY-THEORY (UE)

COURSE DESCRIPTION:

- This course will provide an outline of anatomy and physiology to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.
- Demonstrate the knowledge of the Fundamental Cardio pulmonary anatomy and physiology and to use critical thinking and patient assessment skills to apply the appropriate Respiratory therapy and care of patients with cardiopulmonary problems.

The student will learn an introduction to the field of clinical polysomnography with emphasis in sleep definitions and functions.

OBJECTIVE:

- To develop in depth knowledge on anatomy of various organs and structures in relation to Respiratory system and cardiovascular system.
- To develop exhaustive idealogy of various physiological processes in relation to Respiratory system and cardiovascular system.

LEARNING OBJECTIVE SKILLS:

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain physiological processes with understanding of respiratory and cardiovascular system.
- Will be able to show competency in handling patients suffering from respiratory illness with knowledge on applied anatomy and physiology.

UNIT-I: ANATOMY OF RESPIRATORY SYSTEM

- Structure of respiratory system. Functional Anatomy of the pulmonary system. The upper airway the nose, pharynx, larynx.
- The trachea-bronchial tree histology, the trachea, main stem bronchi, bronchioles, terminal bronchioles.
- The mucous blanket, mucus, cilia function, lung parenchyma, alveolar epithelium, the alveolar macrophage, surfactants.
- Respiratory muscles of the thorax, muscles of ventilation, the neuro chemical control of ventilation.

UNIT-II: PHYSIOLOGY PULMONARY MECHANICS

- The lung thorax relationship
- Physics of ventilation, the principle of elastance, the principle of compliance, the principle of airway resistance.
- Pulmonary function studies lung volumes and capacities FRC, VC (expiratory spirogram)
- Screening pulmonary function testing
- The work of breathing definition, essential clinical factors, ventilator reserve.

UNIT-III: PHYSIOLOGY OF EXTERNAL RESPIRATION

- The systemic capillary blood
- The v/q relationship
- Distribution of pulmonary perfusion gravity, cardiac output
- Regional differences in respiration
- Shunting and dead space
- The concepts of physiologic shunt, anatomic shunt, capillary shunt, shunt effect.

UNIT-IV: ANATOMY OF CARDIO VASCULAR SYSTEM

- Anatomy of heart and great blood vessels
- Gross anatomy and structural features
- Gross anatomy of cardiac chambers
- Atrium
- Ventricles
- AV junction
- Heart valves
- Specialized conduction system
- Sinus nodes

UNIT-V: CARDIO VASCULAR SYSTEM

- Defining circulation
- Myocardial mechanics
- Myocardial contractility
- Ventricular preload
- Ventricular afterload
- Distribution of total body water
- Absolute hypovolemia
- Absolute hypervolemia
- Relative hypovolemia
- Venous return

- Venous driving pressure
- Distribution of circulation
- Assessment of perfusion

UNIT-VI: CLINICAL ASSESSMENT OF CIRCULATION

- Cardiac output measurements
- Thermal dilution technique
- Atrial pressure measurement
- Central Venous Pressure
- Pulmonary Artery Catheter
- Positive inotropic agents
- Diuretic therapy
- After load reduction

UNIT-VII: ASSESSMENT OF THE INTRAPULMONARY SHUNT

- The concept of intrapulmonary shunting
- True shunt mechanism
- Anatomic shunt in pathology
- Capillary shunting pathology
- The shunt equation
- The Fick's equation
- Cardiac output
- Pulmonary capillary oxygen content
- The classic physiologic shunt equation
- Oxygen consumption
- Arterial-Mixed venous Oxygen content difference
- Hypokalemia and intrapulmonary shunting
- Guidelines of interpreting the shunt calculation

UNIT-VIII: ASSESSMENT OF CARDIOPULMONARY RESERVES

- Ventilator muscles fatigue
- Increased muscle demand
- Decreased energy demand
- Decreased energy supply
- Diagnosis
- The ventilator pattern
- Paradoxical breathing
- Vital capacity (VC)
- Negative inspiratory pressure
- Forced expiratory volume (FEV)

- Cardiovascular reserve
- Heart rate and rhythm
- Blood pressure
- Perfusion
- Gas exchange: Respiration
- Alveolar ventilation
- Dead space ventilation
- Arterial pH
- Oxygenation

UNIT:IX -INTRODUCTION TO SLEEP AND DISORDERS OF SLEEP

- The student will learn an introduction to the field of clinical polysomnography with emphasis in sleep definitions and functions.

RECOMMENDED BOOKS:

ANATOMY:

1. Manipal manual for Allied Health Science, sampathmadhyastha.
2. Textbook of human anatomy-BD Chaurasias

PHYSIOLOGY:

1. Basics of medical physiology, D.Venkatesh, H.H. Sudhakar
2. Guyton and Hall Textbook of medical physiology, John E. Hall
3. Essentials of medical physiology, K.Sembulingam, Prema Sembulingam

REFERENCE BOOKS:

1. Manipal manual for Allied Health Science, sampathmadhyastha.
2. Textbook of human anatomy-BD Chaurasias
3. Ganong's medical physiology-kim E. Barrett, 24th edition, Medical Publishers, 2012
4. Egan's Fundamentals of Respiratory Care-Robert M. Kacmarek, 10th edition, Elsevier/Mosby Inc, 2013
5. Anatomy and physiology in health and illness- Ross & Willson, 12th edition, Elsevier healthsciences, 2014.

2. APPLIED ANATOMY, PHYSIOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY-PRACTICAL(UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To inculcate through knowledge on the anatomy of various organs and structures involved in respiratory and cardio vascular systems.
- To elaborate on various physiological processes in relation with respiratory care technology.

LEARNING OBJECTIVES SKILLS:

- Will be able to explain anatomy of various organs with better knowledge on terminologies.
- Will be able to explain physiological processes with understanding of respiratory and cardiovascular system.
- Will be able to show competency in handling patients suffering from respiratory illness with knowledge on applied anatomy and physiology.

1. MODEL

- Trachea
- Bronchi
- Lungs

2. CHARTS

- Dead space
- Breathing reserve
- Ventilation/perfusion ratio
- Cardiac output
- Alveolar ventilation
- Vital capacity

3.SPOTTERS

- Pulse oximeter
- Stethoscope
- BP apparatus
- Peak flow meter

3. PHARMACOLOGY RELATED TO RESPIRATORY

CARETECHNOLOGY–THEORY(UE)

COURSEDESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- At the end of the course the students should be able to:
- To develop understanding of various drugs and their pharmacokinetics in relation to respiratory care.
- To introduce the importance of drug and their adverse effects.

LEARNINGOBJECTIVESKILLS:

- Will be able to explain various drugs and their pharmacokinetics.
- Will be able to recognize developments in treatment with specific drugs during a respiratory illness.
- Will be able to identify and work in close competency with specific drugs treatment and diagnosis.

UNIT-I:RECEPTOR SITE THEORY

- Adrenergic receptor site
- Alpha receptors
- Beta receptors
- Beta2 receptors
- Cholinergic receptors
- Mechanism of bronchospasm
- Mast cell de granulation
- Slow reacting substance of anaphylaxis
- Prostaglandin
- Acetylcholine

UNIT-II:SYMPATHO MIMETIC DRUGS

- Adrenaline
- Salbutamol, Terbutaline, Salmeterol, Formoterol
- Short acting and long acting beta 2 agonists

UNIT-III: PHOSPHO-DIESTERASE INHIBITORS

- Aminophylline
- Theophylline
- Doxophylline

UNIT-IV: ANTICHOLENERGIC DRUGS

- Atropine sulphate (Atropine)
- Ipratropium bromide
- Tiotropium bromide

UNIT-V: CORTICOSTEROIDS IN RESPIRATORY CARE

- Hydrocortisone
- Prednisone
- Dexamethasone
- Triamcinolone
- Beclomethasone
- Solumedrol

UNIT-VI: MUCOKINETIC AGENTS

- Acetylcysteine
- Sodium bicarbonate
- Bromhexine

UNIT-VII: USE OF BLANDAEROSOLSINRESPIRATORYCARE

- Distilled water
- Saline solution
- Propyleneglycol

UNIT-VIII: AEROSOILZEDANTIMICROBIALAGENTS

- Antibiotics – Gentamycin, Amoxicillin
- Anti-viral agents - Ribavirin
- Anti - protozoal agent – Pentamidine

UNIT-IX: ANTI-TUBERCULOUSDRUGS

- 1st Line drugs
- 2nd Line drugs
- MDRTB/ XDR TB

UNIT-X: ANTI ASTHMATIC DRUGS

- Beta-Adreno receptor agonist–systemic and inhaled
- Corticosteroids–systemic and inhaled
- Anti-leukotrieneant agonist
- Sodium Cromoglycate
- Theophylline
- Anti-cholinergic drugs
- Treatment of a cute attacks
- Prophylactic & long term treatment

UNIT-XI: ANTI-MICROBIAL DRUGS

- Antibiotics–Penicillin, Cephalosporin, Quinolones, Aminoglycosides
- Metronidazole

UNIT-XII: ANTIVIRALDRUGS

- Acyclovir
- Zidovudine

UNIT-XIII: ANTI- FUNGAL DRUGS

- Amphotericin–B
- Ketoconazole
- Fluconazole
- Itraconazole

UNIT-XIV: CARDIO VASCULAR DRUGS

- Inotropic drugs
- Dopamine
- Dobutamine

- Isoprenaline
- Anti-anginal drugs -Nitroglycerine
- Anti-arrhythmic drugs-Xylocard(Lignocaine),Procainamide,Amiodarone(cordarone)
- Digoxin
- Diuretics–Furosemide, Potassium sparing diuretics, Thiazides

UNIT-XV: DRUGS USED IN METABOLIC AND ELECTROLYTEIMBALANCE

- Glucose
- Bicarbonate
- Calcium
- Potassium

UNIT-XVI:ANTI-INFLAMMATORYDRUGS

- teroids
- Nonsteroidal anti-inflammatory drugs

UNIT-XVII:ANAESTHETIC DRUGS

- Muscle relaxants
- Local anaesthetic– Lignocaine/ Lidocaines

RECOMMENDEDBOOKS:

Essentials of medical pharmacology, KDTripathi

1. Pharmacology for Dental & Allied health sciences, Padmaja Udayakumar

REFERENCEBOOKS:

1. Essentials of medical pharmacology-Tripathi-7th edition-2013

4. PHARMACOLOGY RELATED TO RESPIRATORY

CARETECHNOLOGY-PRACTICAL(UE)

COURSEDESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop clarity on various pharmacological requirements in hospital.
- To inculcate knowledge on various procedures related to respiratory care.

LEARNINGOBJECTIVESKILLS:

- Will be able to demonstrate mechanism of action of various drugs.
- Will be able to recognize metabolic changes with clarity in pharmacological aspects.
- Will be able to support physicians in various respiratory treatments following laboratory safety.

PRACTICALS/DEMONSTRATIONS:

1. SPOTTERS

- I.V fluids
- Anti-tuberculosis drugs
- IV injections
- Inhalers
- Rotahalers
- Nebulizer
- Bronchodilators

2. CHARTS

- Indication
- Dosage
- Contraindications
- Effects of all respiratory drugs

PSYCHOLOGY(IE)

UNIT1:Basic Concepts of Psychology

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

UNIT2: Learning principles and methods

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

UNIT3: Motivation, Emotion, Memory and forgetting

Motivation-Definitionofmotivation–Theoriesofmotivation-Physiologicalbasisofmotivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression – Theories of emotions. Kinds of remembering – Retrieval processes –The nature of forgetting – Two process theories of memory – Improving memory – Languageandthought–Symbolsandconcepts–Structure–Formsofthought- Thinkingandreasoning –Concept formation.

UNIT4:Development, Sensory Processes and Perception.

Erikson'sstagesofpsychosocialdevelopmentLawrenceKohlberg'sstagesofmoraldevelopment Freud's Stages of Psychosexual Development Physiological basis of behavior –The brain and nervous system –The sensory process , Some general characteristic of senses –Five senses ,Perception: Organization – The role of learning in perception – Perception and attention– Perceptual process.

UNIT5: 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.

UNIT6: Social Psychology

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

UNIT7: Health Psychology

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

Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.

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

REFERENCES:

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

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

SEMESTER-IV

S.No	SUBJECT
1	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I-Theory(UE)
2	Concepts of disease and outlines of clinical evaluation Related to respiratory care technology paper-I-practical(UE)
3	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II-theory(UE)
4	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II-practical (UE)
5	Basics and advanced life support(IE)
6	Sociology(IE)

SEMESTER-IV
CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO
RESPIRATORY CARE TECHNOLOGY PAPER-I (UE)

COURSE DESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- To inculcate knowledge on various respiratory diseases and disorders.
- To elaborate on infections and their control while handling patients with respiratory illness
- To demonstrate general understanding of disease pathogenesis, clinical features and available therapy
- To demonstrate general understanding and be able to perform clinical evaluation of pulmonary system including vital signs.

LEARNING OBJECTIVES SKILLS:

- Will be able to identify the respiratory diseases and their causes.
- Will be able to demonstrate the organism that can cause a specific infection.
- Will be able to express safety while handling patients with respiratory distress.

UNIT-I: INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

UPPER RESPIRATORY TRACT INFECTION

- Acute Rhinitis
- Acute Sinusitis
- Acute Pharyngitis
- Laryngo Tracheitis
- Epiglottitis
- Acute otitis media

UNIT-II: LOWER RESPIRATORY TRACT INFECTION-I

- Bronchitis
- Pneumonia
- Pneumococcal pneumonia
- Staphylococcal pneumonia
- H. Influenza infection

- Klebsiella pneumonia
- Pseudomonas pneumonia
- Anaerobic pulmonary infection

UNIT-III:LOWER RESPIRATORY TRACT INFECTION-II

- Empyema
- Lungabscess
- Bronchiectasis
- Atypical pneumonia
- Viral pneumonia
- Mycobacterial infection
- Tuberculosis-Clinicalfeatures,diagnosisandtreatment(PulmonaryandextraPulmonaryTB)
- Aspergillus lung disease
- Nocardiosis
- Actinomycosis
- Tropicalesinophilia
- Pulmonary infection and complication in HIV infected patients
- Hospital acquired pneumonia
- Ventilator associated pneumonia

UNIT-IV: NON INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

- Thromboembolic disease.
- Pulmonary hypertension
- Sleepapnoea,
- Alveolar hypoventilation
- Obesity hypoventilation

UNIT-V: OCCUPATIONAL LUNG DISEASES

- Environmental and occupational disease
- Silicosis.
- Coal workers pneumoconiosis.
- Asbestos related disease.
- Occupational asthma.
- Hypersensitivity pneumonitis.
- Idiopathic/immunologic/Granulomatous disease- sarcoidosis.
- Benig nneoplasmoflung-bronchial carinoids.
- Lungcancer- etiology, pathology, classification, staging, treatment

RECOMMENDED TEXTBOOKS:

1. Textbook of pathology–Pocket Harsh Mohan's-2nd edition, 2013
2. Basic pathology– Pocket Robbins– 7th edition, 2014

REFERENCE BOOKS:

Principles and practice of medicine –Davidson's–22nd edition, 2014

CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY PAPER I – PRACTICAL (UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop knowledge on various respiratory disease and disorders.
- To develop knowledge on safety and infection control methodologies.

LEARNING OBJECTIVES SKILLS:

- Will be able to perform various diagnostic procedures in support to the physicians.
- Will be able to demonstrate competency in interpretation of applied microbiological aspects.
- Will be able to express better safety protocols for handling patients with respiratory tract infections.

PRACTICALS/DEMONSTRATIONS:

- All the types of Pneumonia- Klebsiella pneumonia. Tuberculosis.
- Case discussion- Lung abscess-
Signs, symptoms, diagnosis and treatment, Occupational lung diseases - Signs, symptoms, diagnosis and treatment, Lung cancer – Etiology, pathology, classification and treatment.
- Lower Respiratory Tract Infections
- Upper Respiratory Tract Infections

2. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY PAPER-II- THEORY(UE)

COURSE DESCRIPTION:

- This course will provide an outline of pharmacology related to respiratory care to improve the student's understanding of the technical and diagnostic procedures used with special emphasis on applied aspects.

OBJECTIVE:

- To develop knowledge on drugs and their pharmacokinetics.
- To develop in depth knowledge on diagnostic procedures of various respiratory diseases.
- To demonstrate general understanding and be able to perform clinical evaluation of pulmonary system including vital signs

LEARNING OBJECTIVES SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT-I: AIRWAY DISEASE

- Asthma—clinical presentation and diagnosis, investigation and management pharmacology.
- COPD - Definition, clinical features, laboratory manifestation, patho-physiologies, management, pulmonary rehabilitation
- Emphysema
- Acute respiratory failure—pathogenesis of ARF lung failure, pump failure, pulmonary pathology, leading to acute respiratory failure.

UNIT-II: RESTRICTIVE LUNG DISEASES

- Acute Restrictive pathology
- Equal diminishment of all lung volumes
- Major diminishment of vital capacity
- Major diminishment of functional residual capacity
- Atelectasis
- Neuro muscular diseases

- Central nervous system depression

UNIT-III:DISEASES OF PLEURA

- Pleural effusion
- Pneumo thorax

UNIT-IV: DISEASES OF MEDIASTINUM AND CHEST WALL

UNIT-V: CLINICAL EVALUATION OF THE PULMONARY SYSTEM

- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Vital Signs
- Assessment of portable chest x -ray, principle of x-rays, assessing the chest film.

UNIT-VI: PRINCIPLE IN THE ASSESSMENT OF PULMONARY PERFORMANCE

UNIT-VII: DISORDERS OF THE PULMONARY INTERSTITIUM

UNIT-VIII: LUNG IN SYSTEMIC DISORDERS

- RA
- SLE
- PSS

UNIT-IX: EFFECTS OF AIR POLLUTION ON LUNG

RECOMMENDEDTEXT BOOKS:

1. Textbook of pathology– PocketHarsh Mohan's -2nd edition,2013
2. Basic pathology– PocketRobbins– 7th edition,2014

REFERENCEBOOKS:

1. Principles and practice of medicine –Davidson's – 22nd edition,2014

4 CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY PAPER- II – PRACTICAL(UE)

COURSE DESCRIPTION:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

OBJECTIVE:

- To develop knowledge on drugs and their pharmacokinetics.
- To develop in depth knowledge on diagnostic procedures of various respiratory diseases.

LEARNING OBJECTIVES SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Clinical evaluation of the pulmonary system
- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Assessment of portable chest-xray
- Principle of xrays
- Assessing the chest film
- The application of pulmonary function studies
- Asthma
- COPD
- Emphysema
- Diseases of the Mediastinum of the Chest Wall
- Pleural Effusion
- Pneumothorax
- Effects of Air Pollution of the Lung

BASIC AND ADVANCED LIFE SUPPORT

1. BLS
2. TRIAGE
3. Primary Survey
4. Secondary Survey
5. Airway & Ventilatory management
6. Shock
7. Central & peripheral venous access
8. Thoracic trauma–Tension pneumothorax
9. Other thoracic injuries
10. Abdominal trauma– Blunt injuries
11. Abdominal trauma–Penetrating injuries
12. Spine and spinal cord trauma
13. Head trauma
14. Musculoskeletal trauma
15. Electrical injuries
16. Thermal burns
17. Cold injury
18. Pediatric trauma
19. Trauma in pregnant women
20. Workshop BLS
21. Workshop cervical spine immobilization
22. Imaging studies in trauma
23. The universal algorithm for adult ECC
24. Ventricular fibrillation/ Pulseless ventricular tachycardia algorithm
25. Pulseless electrical activity(PEA)/asystole algorithm
26. Brady cardia treatment algorithm
27. Tachy cardia Treatment algorithm
28. Hypotension/Shock
29. Acute myocardial infarction
30. Pediatrics Advanced life support
31. Defibrillation
32. Drugs used in ACLS
33. Emergency cardiac pacing
34. AED
35. Techniques for oxygenation and ventilation

SOCIOLOGY

Unit1: 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

Unit2: 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,

Unit3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

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

Unit4: 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,

Unit5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

- Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today, Anthropological Perspectives, Early Anthropologist
- Environment and culture, Kinship, Clan Ethnology, 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. Gishbert P. Fundamentals of sociology, 3rd Edition, 2004, Orient Longman publications
3. Neil J. Smelser, Handbook of sociology, 1988. Sage publication
4. Johnson R.M., Systematic Introduction to Sociology, 1960, Allied Publishers
5. Cultural Anthropology, Barbara D. Miller, 2006 Pearson/Allyn and Bacon Co
6. C.N. Shankar Rao., Introduction to Sociology, 2008,
7. S.CHAND & Company Publications. 7.C.N. Shankar Rao., Sociology of India, S.CHAND & Company Publications.

SEMESTER-V

SL. NO	SUBJECT
1	Respiratory care technology Part I–Paper I–Theory(UE)
2	Respiratory care technology Part I–Paper I–Practical(UE)
3	Respiratory care technology Part I–Paper II–Theory(UE)
4	Respiratory care technology Part I–Paper II–Practical(UE)
5	Environmental science and Community medicine – Theory(IE)
6.	Bio-Statistics and Research Methodology(IE)
7.	Basic Nutrition (Elective) / Advanced Diagnostic technique (Elective)(IE)

SEMESTER-V

1. RESPIRATORY CARE TECHNOLOGY PART I – PAPER I – THEORY (UE)

COURSE OBJECTIVE

- The Student will be able to demonstrate the competency to perform and operate respiratory equipments designed to deliver medical gas therapy.
- Perform diagnostics tests performed to evaluate the cardiopulmonary function and tests to evaluate blood gas transport – arterial blood gas analysis.
- Demonstrate the knowledge of the function and troubleshooting of spirometry equipments, bronchoscope, thoracoscope, and its operations, etc.,

LEARNING OBJECTIVES SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT I:

OXYGEN SUPPLY SYSTEM

- Identification of medical cylinders, Safety precaution on using, Calculation of cylinder contents, Medical gas piping, Liquid oxygen systems, Flowmeter & regulators

OXYGEN ADMINISTRATION

- Low flow oxygen therapy (nasal cannula, Partial re-breathing mask, Disposable non re-breathing mask) High flow oxygen delivery system (Venturi mask, Enclosures, Croupettes, Isolette, Head box)

OXYGEN THERAPY

- External respiration (FiO_2 , Alveolar gas exchange, mixed venous oxygen content, Distribution of ventilation)
- Blood oxygen transport (Cardiac output, Oxygen, Hemoglobin oxygen affinity)

- Hypoxemia (Physiologic causes of hypoxemia, Pulmonary response to hypoxemia, Cardiovascular response to hypoxemia, Hypoxemia and oxygen therapy) Int

GOALS OF OXYGEN THERAPY

- Administration of oxygen (F_{iO_2} , Gas delivery systems)

CLINICAL GUIDELINES FOR OXYGEN THERAPY

- Evaluation of oxygen therapy (Physical examination of cardiopulmonary systems, Arterial blood gas measurements)

OXYGEN AS A DRUG

- Indications of oxygen therapy, Administration, Uptake and distribution, Metabolism and excretion.

UNIT II:

HYPOXEMIA AND OXYGEN THERAPY

- Refractory hypoxemia: Clinical relevance

HYPOXIC PULMONARY VASOCONSTRICTION (HPV) PHYSIOLOGIC SHUNTING AND OXYGEN THERAPY DENITROGENATION ABSORBING ATELECTASIS (Clinical relevance) PULMONARY OXYGEN TOXICITY

- (Intracellular metabolism of oxygen, Alveolar oxygen tensions, Indications for 70% to 100% Oxygen)
- Helium/Oxygen therapy
- Nitric Oxide
- Hyperbaric oxygen therapy

UNIT III:

PULMONARY FUNCTION TESTING EQUIPMENTS

- Volume displacement spirometer, Blood gas electrodes, Oximeters related devices, Body plethysmography.

COMPUTERS IN THE PULMONARY FUNCTION LABORATORY QUALITY ASSURANCE IN THE PULMONARY FUNCTION LABORATORY AFFECTING FACTORS—ANALYTICAL—NON-ANALYTICAL INTERPRETING RESULTS & REPORTING PULMONARY FUNCTIONS TESTS

- Lung volume test
- Ventilation and “ventilator control test”
- Pulmonary mechanics using spirometer
- Gas distribution test using He dilution, N₂, washouts, body plethysmography
- Dilution fact or for carbonmonoxide
 - Single breath method
 - Steady state methods
- Blood gas analysis, capnography and related test
- Exercise testing— 6-minutewalk test, sit-to-standtest, shuttle walk test, CPET
- Specialized test, non invasive monitoring
- Before and after bronchodilator studies
- Quantitative methachodilator tests
- Testing for exercise induced asthma
- PFT for disability
- PFT in children
- Critical care monitoring
- Bronchial provocation tests
- Sweat chloride test
- Saccharine test
- The application of bedside pulmonary function studies (Tidalvolume, minute ventilation, forced vital capacity, negative inspiratory force, clinical interpretation)

UNITIV:

DIAGNOSTICPROCEDURES

- Bronchoscopy(Rigid bronchoscope, Flexible fiber optic bronchoscope, Equipment maintenance Transbronchiallengbiopsy, Bronchoalveolarlavage, Pediatricbronchoscope)
- Fluoroscopy
- Lungbiopsy(Percutaneousfineneedlebiopsy, Opencutbiopsy, needle biopsyofpleura)
- Thoracoscopy
- Mediastinoscopy
- Transtracheal aspiration

- Imaging sciences (Assessment of the portable chest x-rays, Principle of X-rays, computerized tomography, bronchography, pulmonary angiography)
- Nuclear magnetic resonance imaging
- MRI
- Diffusion and Perfusion scan
- Ultrasound thorax
- Bedside use of arterial and venous oximetry
- Disturbances of alveolar ventilation
- Right heart catheterization and monitor so far arterial pressure
- Chest tube insertion and monitoring

UNIT V:

ARTERIAL BLOOD GAS ANALYSIS – Evaluate/Acid base homeostasis

REFERENCE BOOKS:

- Egan's Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Scot Irwin, Jan Stehentecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, Mosby, USA.
- John F Murray, Jay A Nadel,
Textbook of Respiratory Medicine, 2nd edition W.B Saunders company USA.
- Shoemaker, Ayres,
Greenvik, Holbrook, Textbook of critical care, 4th edition, W.B Saunders company 1984.

2. RESPIRATORY CARE TECHNOLOGY PART I– PAPER I – PRACTICAL (UE)

COURSEOBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

PRACTICALS/DEMONSTRATIONS:CHARTS/SPOTTERS:

- Oxygen delivery devices
- Bronchoscope
- Thoracoscope
- Lung biopsy needles
- ICD tube
- Spirometer
- PFT interpretation
- ABG interpretation
- Chest X-Rays
- O2 Cylinders
- Colour Codes of Oxygen Cylinders
- Flowmeter
- Humudifiers

3. RESPIRATORY CARE TECHNOLOGY PART –I PAPER –II- **THEORY(UE)**

COURSE DESCRIPTION:

- To gain knowledge about pulmonary edema and acute lung injury and its therapeutic modalities involved in the management of the same.
- The student will be able to demonstrate understanding and apply knowledge on chain of infection, cross contamination. To possess knowledge about importance of infection control, handwashing, universal precautions.
- The student will be able to demonstrate understanding and knowledge of EEG, sleep staging, respiratory and cardiovascular monitoring sleep related breathing disorders, etc.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNITI: PULMONARY EDEMA

- Etiology
- Types of pulmonary edema
- Hemodynamic Pulmonary edema
- Neurogenic Pulmonary edema
- Re-expansion edema
- Permeability Pulmonary edema
- General principles of therapy
- Cardiogenic Pulmonary edema
- Preload reduction
- Afterload reduction
- Increasing contractility
- Supportive therapy
- Fluid therapy and pulmonary edema

UNITII: ACUTE LUNG INJURY

- Parenchymal responses to injury
- Acute lobar and segmental atelectasis
- Pulmonary embolisation

- Diffuse parenchymal function
- Defining ARDS
- Infant respiratory distress syndrome
- Defining Acute Lung Injury(ALI)
- The NCE/ARDS spectrum
- Refractory Hypoxemia
- Compliance
- Non cardio genic edema
- Adult lung injury
- Clinical diagnosis of ALI
- Toxic oxygen radicals and ALI
- Principles of airway pressure therapy in ALI
- Positive-pressure ventilation
- PEEP therapy in ALI
- Early prophylactic PEEP therapy
- Fluid therapy of ALI
- Specific therapy of ALI

UNITIII: TOXIC INHALATION

- Aspiration pneumonia (Definition, Diagnosis, Clinical assessment, Investigations &management)
- Bacterial aspiration
- Near drowning
- Carbon monoxide poisoning (Diagnosis, Treatment)
- Smoke inhalation
- Toxic Fume inhalation
- Thermal injury

UNITIV: PULMONARY REHABILITATION

- Home rehabilitation
- Homeoxygen administration
- Oxygen concentrator
- Smoking cessation
- Muscle Strengthening Exercises
- Yoga therapy

UNITV: LUNGTRANSPLANTATIONUNITVI:BASIS OF ASEPSIS

- Mechanism of microorganism transmission
- Universal(standards)precautions
- Isolation procedures: infection control
- Sterilization and disinfection techniques

RECOMMENDED TEXTBOOKS:

REFERENCE BOOKS:

- Egan's Fundamentals of respiratory care.
- Respiratory care exam review– Gary Persing.
- Basic clinical lab competencies for respiratory care–Gary C White
- Scot Irwin,
Jan Stephenteklin, Cardiopulmonary Physicaltherapy, a guide to practice, 3rd edition, Mosby, USA.
- Donna Frownfelter,
Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.
- Craig L, Scanlan, Egan's Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevensadowsky, HELLAN, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B Saunders company USA.
- John F Murray, Jay A Nadel, Textbook of Respiratory Medicine, 2nd edition W.B Saunders company USA.

4. RESPIRATORY CARE TECHNOLOGY PART –I PAPER –II-

PRACTICAL(UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Universal precaution materials
- ARDS lung
- Pulmonary edema lung
- Oxygen concentrator
- Smoking cessation
- PEEP therapy
- IV Fluids of Pulmonary Edema
- Drugs of Pulmonary Edema
 - Lung Transplantation

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable and Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effects of modern agriculture, Fertilizer/pesticide problems, Water logging, and salinity, Energy Resources.
- **Ecosystems:** Concept of an Ecosystem, Structure And Function so far 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 wellbeing, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health – Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.
- **Epidemiology:** Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descriptive epidemiology – Analytical epidemiology- Cohort study – Experimental epidemiology – RCT- Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology

Definitions Dynamic of disease transmission & Mode of Transmission –

Disinfection – Definitions

Types Agents used Recommended disinfection procedures –

Investigation of an epidemic.

- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1). Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution Ventilation: Definition Standards of ventilation Types of Ventilation. Light, Noise & Radiation, Meteorological environment, Housing, Disposal of waste Excretion disposal

BIOSTATISTICS & RESEARCH METHODOLOGY(ELECTIVE) (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

Immunodiagnosics: 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.

SEMESTER-VI

SL.NO	SUBJECT
1	Respiratory care technology Part II -Paper-I– Theory(UE)
2	Respiratory care technology Part II-Paper-I –Practical(UE)
3	Respiratory care technology Part II -Paper-II–Theory(UE)
4	Respiratory care technology Part II -Paper-II–Practical(UE)
5	Health care and basic principles(IE)
6.	Hospital Management/ Applied clinical research (Elective) (IE)

SEMESTER VI
RESPIRATORY CARE TECHNOLOGY PART II - PAPER-I
-THEORY (UE)

COURSE OBJECTIVE:

- Demonstrate the competency ability to perform and operate respiratory equipments designed to deliver metal gas therapy, humidity and aerosol therapy.
- Demonstrate the competency ability to perform chest physical therapy and postural drainage in patients with retained secretions.
- To provide a basic knowledge and understanding of ECG and CVP monitoring.
- Recognize life threatening situation and administer necessary patient care.
- Demonstrate competency to understand and gain knowledge about sleep related disorders and EMG monitoring, narcolepsy, sleep seizures etc.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize drugs which are to be used during respiratory illness.

UNIT I: BRONCHIAL HYGIENE THERAPY RETAINED SECRETIONS

- Mucociliary escalator
- Mucociliary activity, mucous production
- Parenchymal hygiene
- The cough mechanism
- Anatomy of cough mechanism, purpose of cough mechanism
- Pathophysiology of retained secretions
- Clinical manifestations
- Common etiologies of retained secretions

UNIT II: HUMIDITY AND AEROSOL THERAPY

- Humidity
- Airway humidification, humidifiers, clinical applications of humidifiers
- Aerosols
- Aerosol stability, penetration and deposition, water content, airway resistance

- Clearance of aerosols, aerosol generators, aerosol delivery devices, nebulizer, MDI, DPI, SPACER
- Goals of aerosol therapy
- Jet nebulizer, hydro dynamic nebulizer, ultrasonic nebulizer
- Aid to bronchial hygiene therapy, humidification of inspired gases, delivery medications
- Administration of aerosol therapy
- Swelling of retained secretions, precipitation of broncho spasm, fluid overload, cross contaminations.

UNIT III: CHEST PHYSICAL THERAPY

- Goals of chest physical therapy
- Techniques promoting bronchial hygiene
- Postural drainage, lung segments, chest percussion, chest vibration, cough instruction and stimulation
- Techniques improving breathing efficiency
- Incentive spirometry
- Defining sustained maximal inspiration
- Rationale SMI prophylaxis, clinical goals of SMI and administration.

IPPB THERAPY

- Physiology of IPPB the work of breathing, clinical goals.
- The criteria of IPPB effectiveness

UNIT IV: HEMOSTASIS

- Hemo dynamic monitoring
- ECG arrhythmias diagnosis
- Bedside interpretation of ECG tracing
- Central venous pressure monitoring
- Thermo dilation cardiac output
- Cardio pulmonary Resuscitation techniques

UNIT V: SLEEP RELATED MOVEMENT DISORDERS AND EMG MONITORING

The student will learn an overview of muscular structure and function as it relates to sleep, specifics regarding the lower extremities, chin and upper airway. This information will be a precursor for the discussion of periodic

limb movement disorder (PLMD) and restless leg syndrome (RLS). A presentation of the criteria for scoring periodic limb movements and how to chart the findings will be discussed in this course.

NARCOLEPSY, SLEEP RELATED SEIZURES AND PARASOMNIAS

The student will learn about specific sleep disorders, emphasis is put on disorders such as parasomnias, seizures and narcolepsy or idiopathic central nervous system hyper somnias evaluated by the polysomnography

MSLT AND MWT

The student will learn specific sleep testing protocols used in the assessment of disorders of excessive daytime somnolence. Disorders such as narcolepsy or idiopathic central nervous system hyper somnia can be evaluated by the combination of night time polysomnography followed by a multiple sleep latency test (MSLT) starting the following morning. The test measures the time it takes to fall asleep when the opportunity is presented. An alternative to the MSLT is the maintenance of wakefulness test (MWT) which investigates how

long wakefulness can be maintained. Electrode placement, complex procedural information and scoring criteria will be discussed

INSOMNIA, CIRCADIAN RHYTHM

The student will learn about circadian rhythm concepts and how it relates to normal sleep. This course emphasizes on the comprehension of deviations of normal sleep in relation to insomnia/psychiatric disorders.

EEG AND SLEEP STAGING

The student will learn normal sleep architecture and the characteristics of sleep stages. Non-REM stages Wake, 1, 2, 3, 4 and stage REM will be discussed and polysomnographic examples will show how these variables, viewed collectively, provide diagnostic information regarding normal and / or abnormal sleep. Hands-on scoring will comprise a large portion of the course with numerous practice opportunities. The course includes scoring of EEG (brainwave) arousals, Digital Concepts of Analog-To-Digital Conversion (ADC), horizontal and vertical resolution and instrument settings together with sampling rate, dwell time, aliasing, and bit capacity as it relates to polysomnography.

CARDIOVASCULAR MONITORING

The student will learn basic cardiac anatomy and physiology as it relates to the field of sleep as well as an introduction to basic EKG signal generation and demonstration of normal and abnormal EKG signals. This knowledge will serve as an initial exposure to identify emergent and non-emergent situations regarding cardiac rhythm disturbances

RESPIRATORY MONITORING

The student will learn the anatomical structures related to breathing and the way that they work together will provide the student with a basis for understanding the more common respiratory abnormalities seen in the sleep lab, and the distinguishing characteristics of respiratory scoring. Instruction in how the brain, chemical composition of the blood, and feedback mechanisms from the chest wall must properly communicate to produce a normal respiratory pattern.

SLEEP RELATED BREATHING DISORDERS

The student will learn about the most common disease states that may present to the sleep lab. Discussion will include the background, clinical presentation, pathology, and diagnosis of Obstructive Sleep Apnea Syndromes, Central Sleep Apnea and Hypoventilation together with scoring respiratory events.

TREATMENT FOR SLEEP RELATED BREATHING DISORDERS

The student will learn the basics of the various therapeutic interventions of Positive Airway Pressure (CPAP, Bi-Level), and O₂ used during the course of a sleep study. Proper mask fitting technique, vital to a patient's tolerance of the interventions, will be reviewed

REFERENCEBOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review– GaryPersing.
- Basic clinical lab competencies for respiratory care– GaryC White
- Principles and practices of sleep medicine –William Dement.
- GeorgeMathew.KMedicinePrepmanual1stedition.B.IChurchillLivingstonePvt Ltd.New delhi1995
- ScotIrwin, Jan Stephentecklin, Cardio pulmonaryPhysicaltherapy,aguidetopractice,3rd edition, mosby, USA.

- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardio pulmonary
- Craig L, Scanlan, Egan's Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, HELLAN, AHillegas, Essential of Cardiopulmonary physical therapy, W.Bsaunders company USA.
- John FMurray, Jay ANadel, Textbook of Respiratory Medicine, 2nd edition W.Bsaunders company USA.
- Braunwald (edr), Heart disease, A textbook of cardiovascular medicine, 4th edition, W.Bsaunders company, USA 1992.
- Shoemaker, Ayres, Greenvik, Holbrook, Textbook of critical care, 4th edition, W.Bsaunders company 1984.

1. RESPIRATORY CARE TECHNOLOGY PART II - PAPER-I
- PRACTICAL (UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Aerosol delivery devices
- Humidifiers
- MDI
- DPI
- ECG leads
- Cough mechanism
- Broncho spasm
- Circadian rhythm
- Incentive spirometry

1. RESPIRATORY CARE TECHNOLOGY PART II PAPER

II –THEORY (UE)

COURSE OBJECTIVE:

- Demonstrate abilities in understating different artificial airway tubes, size and their utilization clinically maintenance of artificial patient airway, recognize life-threatening situations and administer necessary patient care.
- Demonstrate competent ability to perform and operate respiratory equipment designed to deliver hyper inflation therapy ,mechanical ventilator support and other respiratory therapy ,and arterial blood gas analysis.
- Demonstratecompetentabilityandassumetheresponsibilityoftransportationofcriticallyill.

LEARNINGOBJECTIVESKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

UNITI: AIRWAYS

- Obstructive lesion so flarynx and trachea
- Oropharyngeal airways
- Nasopharyngeal airways
- Artificial airways(Definition, Indication, Hazards of artificial airways)
- Establishing emergency airways
- Technique of intubation
- Post intubation essentials
- Cricothyroidectomy
- Emergency airways in Cardio Pulmonary Resuscitation
- Limitaion of emergency airways
- Naso tracheal tube
- Morden tube material

UNITII: MAINTENANCE OF ARTIFICIAL AIRWAYS & EXTUBATION

- Endotrachealtube Vs Tracheostomy
- Contamination of airway
- Diagnosis of airway
- Incidence of airway contamination
- Common airway contamination
- Nosocomial infections in the respiratory care
- Suctioning the airway
- Complications of the airways
- The suction catheter
- Suction techniques
- Suctioning adaptors
- Obtaining culture specimens
- Humidification of the airways
- Tracheostomy wound care
- Cuffcare
- Inflation technique
- Periodic deflation
- Artificial airways emergencies
- Cuffleaks
- Inadvertent extubation

UNITIII: LARYNGEAL AND TRACHEAL COMPLICATIONS OF ARTIFICIAL AIRWAYS

- Laryngeal complications of endo-tracheal intubation, sorethroat and horse voice
- Glottisedema, sub-glotticedema, ulceration of vocalcords, trachealmucosa, trachealstenosis

UNIT-IV: INTUBATION OF ADULT PATIENT SELECTIVE / EMERGENCY VENTILATOR MANAGEMENT

- Adult patients

- Troubleshooting
- Ventilator control
- Goals and complications of the ventilator
- Indications of the ventilator
- Weaning from mechanical ventilators
- Modern mechanical ventilators
- Non-invasive ventilators
- Adult ventilator management

UNITV:INTENSIVE CARE UNIT

- Common problems in ICU/Non- ICU Adult
- Emergency airway control and long term airway care
- Transport of critically ill
- Nutrition in ICU Patients
- Management of cardiovascular failure in ICU
- Fluid and electrolytes in critically ill patients
- Respiratory monitoring in ICU
- Physical Assessment of critically ill patients
- Important intensive care procedures
- Noninvasive assessment of cardio pulmonary function.

REFERENCEBOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review– GaryPersing.
- Basic clinical lab competencies for respiratory care–GaryC White

2. RESPIRATORY CARE TECHNOLOGY PART II PAPER

II -PRACTICAL(UE)

COURSE OBJECTIVE:

- The students will be posted in the respective areas related to the above subjects to become familiarize with their role and routine procedures related to their CORE technology and to gain hands-on training and knowledge.

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.
- Will be able to demonstrate the diagnostic procedure for identifying the respiratory diseases.
- Will be able to recognize airways which are to be used during respiratory illness.

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Artificial airways
- Endotracheal tubes
- Nasotracheal tubes
- Suction catheter
- Tracheostomy tubes
- Laryngoscope
- CPAP/BiPAP
- Capnography
- OPA
- NPA
- Suction Tube
- T-piece

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review– GaryPersing.
- Basic clinical lab competencies for respiratory care–GaryC White
- Principles and practices of sleep medicine –William Dement.
- GeorgeMathew.KMedicinePrepmanual1stedition.B.IChurchillLivingstonePvt Ltd.New delhi1995

- ScotIrwin,JanStephentecklin ,Cardio pulmonary Physical therapy,aguidetopractice,3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardio pulmonary physical therapy, 3rdMosby, USA.
CraigL,Scanlan,Egan's Fundamentals of Respiratory care,6theditionMosby,1995.
- Stevansadowsky,HEllan,AHillegas,Essential of Cardiopulmonary physical therapy,W.Bsaunders companyUSA.
- JohnFMurray, Jay A Nadel, Textbook of Respiratory Medicine ,2nd edition W.B saunders company USA.
- Braunwald(edr),Heart disease ,A textbook or cardiovascular medicine,4th edition,W.Bsaunders company, USA 1992.
- Shoemaker,Ayres,Greenvik,Holbrook,Textbook of critical care,4th edition, W.Bsaunderscompany1984.

3. HEALTH CARE AND BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

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

2. Health Organization

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

3. Health Policy and National Health Programme

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

4. Health Economics Fundamentals of Economics

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

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

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

7. Economics of Health

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

8.Health Insurance

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 (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 step, advantages and purposes of each step, 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 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 Pharma covigilance Training in clinical research Budgeting in clinical research, Supplies and vendor management.

SEMESTER-VII & VIII

SL.NO	SUBJECT
1	Project/Dissertation

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/ Dissertation

SEMESTER – VIII (FOR ALL SPECIALITIES)

Internship -1 year



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