Dr. M. G. R.

EDUCATIONAL AND RESEARCH INSTITUTE

UNIVERSITY

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

MADURAVOYAL, CHENNAI – 600 095

FACULTY OF ALLIED HEALTH SCIENCE

B.Sc. Respiratory Care Technology

Regulations, Curriculum and Syllabus

2017

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MADURAVOYAL, CHENNAI – 600 095

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

Introduction:

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

1. Short Title and Commencement:

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

2. Eligibility for Admission:

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

i) Physics, Chemistry, Biology

ii) Physics, Chemistry, Botany and Zoology

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

3. Age limit for admission

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

4. Eligibility Certificate

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

5. Registration

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

6. Duration of the course

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

7. Commencement of the Course:

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

8. Curriculum:

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

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

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

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

9. Medium of Instruction:

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

10. Working Days:

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

11. Attendance:

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

12. Condonation of Lack of Attendance:

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

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

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

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

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

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

13. Commencement of the examinations

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

14. Continuous (Internal) Assessment:

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

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

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

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

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

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

EXAMINATION PATTERN

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

THEORY **MAX.MARKS**- 60 Marks **DURATION** -$2^{1}/2$ Hours

PART –A (Answer any one from Two)

1. Essay (1x15=15 Marks)

PART-B (Answer all questions)

1. Short Notes (5x5=25 Marks)

PART-C (Answer all questions)

1. Short answers (10x2=20 Marks)

PRACTICAL

Practical (including Orals) 15 Marks

CONTINUOUS (INTERNAL) ASSESSMENT

(i) Theory 20 Marks

(ii) Practical 5 Marks

TOTAL - 100 Marks

Question pattern for SEMESTER III – SEMESTER VI

Duration -3hours

Theory Pattern **80 marks**

Section –A (Answer any TWO from THREE)

1. Essay (2x15=30)

Section-B (Answer any EIGHT from TEN)

1. Short notes (8x5=40)

Section-C

1.Very short notes (5x2=10)

Internal assessment **20 marks**

- **Based on CAT Exams**

TOTAL **100 Marks**

Practicals Pattern

Max marks:80

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

Internal assessment

Max marks:20

- Based on CAT Exams
- Attendance
- Log book

TOTAL **100 Marks**

17. Marks Qualifying for a Pass:

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

(i) 40% minimum in the University End-Semester Theory examination

(ii) 40% minimum in the University End-Semester Practical examination

(iii) 40% of marks in the subject where internal evaluation alone is conducted

(iv) 40% of aggregate of theory, practical and internal assessment taken together

18.Classification of successful candidates:

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

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

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

19.Revaluation of answer papers

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

20. Carry- over of failed subjects

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

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

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

21. Temporary break of study

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

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

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

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

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

d) For condonable break of study:

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

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

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

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

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

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SCHEME OF EXAMINATION

SEMESTER – I **TOTAL HOURS : 330**

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

SEMESTER – II

TOTAL HOURS : 420

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

SEMESTER – III (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 420

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

SEMESTER – IV (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 420

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

SEMESTER – V (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS : 390

S.No	Paper	Hours / Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		
				Theory	Practical	Theory	Practical	Total
1	Respiratory care technology Part I – Paper I – Theory(UE)	**60** hours	-	**20**	-	**80**	-	**100**
2	Respiratory care technology Part I – Paper I – Practical(UE)	-	**120** hours	-	**20**	-	**80**	**100**
3	Respiratory care technology Part I – Paper II – Theory(UE)	**60** hours	-	**20**	-	**80**	-	**100**
4	Respiratory care technology Part I – Paper II – Practical(UE)	-	**120** hours	-	**20**	-	**80**	**100**
5	Environmental science and Community medicine – Theory(IE)	**30** hours	-	-	-	**50**	-	**50**

SEMESTER – VI (RESPIRATORY CARE TECHNOLOGY)

TOTAL HOURS: 390

S.No	Paper	Hours/ Semester		Evaluation (Marks)				
		Theory	Practical	Continuous Assessment (Internals)		End Semester examination (University/Department Exams)		
				Theory	Practical	Theory	Practical	Total
1	Respiratory care technology Part II - Paper- I – Theory(UE)	**60** hours	-	**20**	-	**80**	-	**100**
2	Respiratory care technology Part II - Paper- I – Practical(UE)	-	**120** hours	-	**20**	-	**80**	**100**
3	Respiratory care technology Part II - Paper- II – Theory(UE)	**60** hours	-	**20**	-	**80**	-	**100**
4	Respiratory care technology Part II - Paper- II – Practical(UE)	-	**120** hours	-	**20**	-	**80**	**100**
5	Healthcare and basic principles(IE)	**30** hours	-		-	**50**	-	**50**

SEMESTER – VII (FOR ALL SPECIALITIES)

Project/Dissertation

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

SEMESTER – VII & VIII (FOR ALL SPECIALITIES)

Internship -1 year

SEMESTER - I

	Subject
	Anatomy – I (UE)
	Physiology –I (UE)
	Biochemistry - I(UE)
	Microbiology - I(UE)
	Pathology – I(UE)
	English (IE)

SEMESTER - I

ANATOMY – I (UE)

Objectives:

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

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

Learning Objectives: Skills

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

CONTENTS

Unit I

Organization of the Human Body

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

Cell

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

Tissues

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

Unit II

Systems of Support and Movement

1. **Skeletal system**

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

2. **Muscular system**

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

Unit III

Control Systems of the Body

1. **Nervous system**

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

2. **Sense organs**

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

3. Endocrine system

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

PRACTICAL & VIVA VOCE

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

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

PRACTICAL & VIVA VOCE

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

BIOCHEMISTRY-I (UE)

Objectives:

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

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

CONTENTS

Unit I - CARBOHYDRATES

Carbohydrates:

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

Metabolism of Carbohydrates :

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

Bioenergetics :

- Importance of ATP, Outline of respiratory chain.

Unit II - LIPIDS

Lipids:

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

- Triglycerides,
- Phospholipids

Metabolism of Lipids :

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

Unit III - VITAMINS

Vitamins:

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

Unit IV - ENZYMES

Enzymes:

- Definition,
- Classification,
- Coenzymes,

Factors affecting enzyme activity, Types and examples of enzyme inhibition

PRACTICAL & VIVA VOCE

1. Reactions of Glucose

2. Reactions of Fructose

3. Reactions of Maltose

4. Reactions of Lactose

5. Tests for Sucrose

6. Tests for Starch

7. Identification of unknown Carbohydrates

8. Spotters

- **CRYSTALS**

- Maltosazone
- Lactosazone
- Glucosazone/Fructosazone

- **REAGENTS**

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

- **CHEMICALS**

- Sodium Acetate
- Phenyl hydrazine
- α Naphthol

- **STRUCTURES.**

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

- **VITAMINS**

- Carrots
- Rickets
- Scurvy
- Egg

MICROBIOLOGY – I (UE)

OBJECTIVE:

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

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

Contents

Unit I:

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

Unit II:

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

Unit III

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

PRACTICAL & VIVA VOCE

1. **Gram staining**

2. **Spotters:**

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

PATHOLOGY-I (UE)

Objective:

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

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

Contents

Unit-I. Introduction to cell

- Normal Cell Structure Function

Unit-II.Cell injury and Adaptation

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

Unit-III.Inflammation and Repair

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

Unit-IV.Hemodynamic Disorder

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

Unit-V.Infectious Disease

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

Unit-VI.Neoplasia

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

Unit-VII.Genetics

- Down syndrome
- Klinfelter syndrome
- Turner syndrome

Unit-VIII. Radiation

- Effects of Radiation

PRACTICAL & VIVA VOCE

- **DIFFERENTIAL COUNT**
  - Spotter

- **GROSS (SPOTTER)**
  - Fatty liver
  - Lipoma
  - Dry gangrene foot
  - Wet gangrene bowel
  - CVC Spleen
  - Hydatid cyst
  - TB – Lung

- **INSTRUMENTS**
  - Westergrens ESR tube
  - Sahlihemocytometer

- Neaubaur's chamber
- Bone Marrow Needle

SEMESTER-II

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

SEMESTER II

ANATOMY – II (UE)

Objectives:

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

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

Unit I

Maintenance of the Human Body

1. Cardio-vascular system

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

2. Lymphatic system

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

3. Respiratory system

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

Unit II

4. Digestive system

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

5. Urinary system

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

Unit III

6. Reproductive system

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

Anatomical Regions

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

PRACTICAL & VIVA VOCE SYLLABUS

- **Endocrine System**

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

- **Cardio-Vascular System**

- Heart

- **Lymphatic system**

- Spleen

- **Respiratory System**

- Lungs
- Larynx
- Trachea

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

- **Urinary system**
- Kidneys
- Ureter
- Urinary bladder

- **Reproductive System**

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

- **Viva Voce**

- Radiology – Xrays
- Osteology
- Charts
- Models

Recommended books:

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

References:

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

PHYSIOLOGY-II (UE)

Unit I Cardiovascular System

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

Unit -IV Nervous system

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

Unit -V Respiratory system

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

Unit – VI Special sense and skin

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

Unit – VII Reproductive system

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

Unit – VIII Endocrine system

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

PRACTICAL & VIVA VOCE SYLLABUS

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

BIOCHEMISTRY – II (UE)

Objectives:

At the end of the semester the students should be able

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

Unit I - PROTEINS

Proteins :

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

Metabolism of Proteins :

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

Unit II -- NUCLEIC ACIDS

Nucleic acids:

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

Unit III - HAEMOGLOBIN

Haemoglobin:

- Structure & Function of Haemoglobin
- Haemoglobin Metabolism

Unit IV-- MINERALS

Minerals:

- Macro & Minor Minerals & Metabolism

Unit V -- NUTRITION

Nutrition:

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

Unit VI -- ORGAN FUNCTION TEST

- RFT

Unit XI - ACID BASE BALANCE

Acid Base Balance:

- pH Homeostasis
- Buffers
- Buffers
- Acidosis
- Alkalosis

PRACTICAL & VIVA VOCE

- Non- Protein Nitrogenous Substances
- Analysis Constituents of normal urine
- Analysis Constituents of abnormal urine
- Identification of abnormal constituents in urine

- Estimation of Glucose in blood
- Estimation of Urea in blood.

Spotters

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

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

MICROBIOLOGY – II (UE)

OBJECTIVE:

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

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

Unit-I	**Virology**: Introduction to virology, List of medically important viruses and diseases (AIDS, Hepatitis, Rabies, Polio) and Lab diagnosis of viral infections
Unit - II	**Mycology**: Introduction to Mycology, List of medically important fungi and diseases (Candidiasis, Cryptococcosis, Dermatophytes, Aspergillosis and Mucor mycosis) and Lab diagnosis of fungal infections.
Unit - III	**Parasitology**: Introduction to Parasitology, List of medically important parasites and diseases (E.histolytica, Plasmodium, W.bancrofti, Ascaris,Ancylostoma) and Lab diagnosis of parasitic infections
Unit - IV	**Applied Microbiology**-Collection and transport of clinical specimen, Sexually transmitted disease, Hospital acquired infection, Urinary tract infection, Skin and Soft tissue infection, Anaerobic infection, Respiratory tract infection and Bloodstream infection, Immunoprophylaxis, Biomedical Waste Management and standard precautions.

PRACTICAL & VIVA VOCE

I.SPOTTERS

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

II.Clinical case discussion with charts

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

RECOMMENDED BOOK:

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

REFERENCE BOOKS:

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

PRACTICAL BOOK:

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

PATHOLOGY- II (UE)

1. CVS

-Atherosclerosis

-Ischemic heart diease

-Congenital heart diseae

-Valvular heart disease

2. RESPIRATORY SYSTEM

-Bronchial Asthma

-Emphysema

-Bronchiectasis

3. GIT

-Gastric ulcer

-Tumors of GIT

4. HEPATOBILIARY

-Hepatitis

-Liver Abscess

-Cirrhosis

-Cholecystits

5. KIDNEY AND URINARY TRACT

-Renal stones

-UTI and Pyelonephritis

-Renal cell carcinoma(RCC)

-Renal Failure

6. REPRODUCTIVE SYSTEM

-Diseases of testis, uterus, cervix and ovary

7. CNS

-Infections

8. BONES and JOINTS

-Septic Arthritis

-Osteomyelitis

-Rhematoid Arthritis

9. ANEMIA

10. AUTOIMMUNE DISEASES

PRACTICAL & VIVA VOCE

INSTRUMENT TEST

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

SPECIMEN

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

PHARMACOLOGY (UE)

COURSE OBJECTIVES:

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

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

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

Introduction

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

Unit I:

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

Unit II

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

Unit III:

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

Unit IV

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

Unit V

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

Unit VI

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

Recommended books:

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

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

Reference books:

Essentials of Medical Pharmacology by KD Tripathi, 7th edition

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

PRACTICAL & VIVA VOCE

Learning Objective

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

Instruments

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

on Topical Preparation, Ointment, Lotion, Powder, Drops – eye / ear

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

Spotters: drugs

Text books suggested for reading:

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

PHYSICS (IE)

Unit 1: Basic concepts

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

Unit 2: Electromagnetic induction

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

Unit 3: Laser

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

Unit 4: Radiation Physics

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

Unit 5: Introduction to Imaging Technique

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

Unit 6: Semiconductor devices

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

Unit 7: Biopotential Recording Systems

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

Computer Science (IE)

1. History of computers,

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

- Characteristics of computers

2. System:

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

3. Office application suite –

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

4. Language

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

5. Programming in C language,

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

Practicals:

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

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 Bio safety (IE)
6	Psychology(IE)

SEMESTER III

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

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

UNIT-I: ANATOMY OF RESPIRATORY SYSTEM

- Structure of respiratory system. Functional Anatomy of the pulmonary system. The upper airway the nose, pharynx, larynx.
- The tracheobronchial tree histology, the trachea, mainstem bronchi, lobar bronchi, segmental bronchi, bronchioles, terminal bronchioles.
- The mucous blanket, mucus, cilia function, lung parenchyma, alveolar epithelium, the alveolar macrophage, surfactants.
- Respiratory muscles of the thorax, muscles of ventilation, the neurochemical control of ventilation.

UNIT-II: PHYSIOLOGYPULMONARY MECHANICS

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

UNIT-III: PHYSIOLOGY OF EXTERNAL RESPIRATION

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

UNIT-IV: ANATOMY OF CARDIO VASCULAR SYSTEM

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

UNIT-V: CARDIO VASCULAR SYSTEM

- Defining circulation
- Myocardial mechanics
- Myocardial contractility
- Ventricular preload
- Ventricular after load
- Distribution of total body water
- Absolute hypovolemia
- Absolute hypervolemia
- Relative hypovolemia
- Venous return
- Venous driving pressure
- Distribution of circulation

- Assessment of perfusion

UNIT-VI: CLINICAL ASSESSMENT OF CIRCULATION

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

UNIT-VII: ASSESSMENT OF THE INTRAPULMONARY SHUNT

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

UNIT-VIII: ASSESSMENT OF CARDIOPULMONARY RESERVES

- Ventilator muscles fatigue
- Increased muscle demand
- Decreased energy demand
- Decreased energy supply
- Diagnosis

- The ventilator pattern
- Paradoxical breathing
- Vital capacity (VC)
- Negative inspiratory pressure
- Forced expiratory volume (FEV)
- Cardiovascular reserve
- Heart rate and rhythm
- Blood pressure
- Perfusion
- Gas exchange : Respiration
- Alveolar ventilation
- Dead space ventilation
- Arterial pH
- Oxygenation

RECOMMENDED BOOKS:

ANATOMY:

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

PHYSIOLOGY:

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

REFERENCE BOOKS:

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

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

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

1. MODEL

- Trachea
- Bronchi
- Lungs

2. CHARTS

- Dead space
- Dyspnoeic index
- Breathing reserve
- Ventilation/perfusion ratio
- Cardiac output
- Alveolar ventilation

- Oxygen carrying capacity
- Vital capacity

3.SPOTTERS

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

3. PHARMACOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY–THEORY(UE)

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

UNIT-I: RECEPTOR SITE THEORY

- Adrenergic receptor site
- Alpha receptors
- Beta 1 receptors
- Beta 2 receptors

- Cholinergic receptors
- Mechanism of bronchospasm
- Mast cell degranulation
- Slow reacting substance of anaphylaxis
- Prostaglandin
- Acetylcholine

UNIT-II: SYMPATHOMIMETIC DRUGS

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

UNIT-III: PHOSPHODIESTERASE INHIBITORS

- Aminophylline
- Theophylline
- Doxophylline

UNIT-IV: ANTICHOLENERGIC DRUGS

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

UNIT-V: CORTICOSTEROIDS IN RESPIRATORY CARE

- Hydrocortisone
- Prednisone
- Dexamethasone
- Triamcinolone
- Beclamethasone
- Solumedrol

UNIT-VI: MUCOKINETIC AGENTS

- Acetylcysteine
- Sodium bicarbonate
- Bromhexine

UNIT-VII: USE OF BLAND AEROSOLS IN RESPIRATORY CARE

- Distilled water
- Saline solution
- Propylene glycol

UNIT-VIII: AEROSOILZED ANTI MICROBIAL AGENTS

- Antibiotics – Gentamycin, Amoxicillin
- Antiviral agents - Ribavirin
- Antiprotozoal agent –Pentamidine

UNIT-IX: ANTI TUBERCULOUS DRUGS

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

UNIT-X: ANTIASTHMATIC DRUGS

- Beta-Adrenoreceptoragonist – systemic and inhaled
- Corticosteroids – systemic andinhaled
- Anti-leucotriene antagonist
- Sodium Cromoglycate
- Theophylline
- Anticholinergic drugs
- Treatment of acute attacks
- Prophylactic & long term treatment

UNIT-XI: ANTIMICROBIAL DRUGS

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

UNIT-XII: ANTIVIRAL DRUGS

- Acyclovir
- Zidovudine

UNIT-XIII: ANTIFUNGAL DRUGS

- Amphotericin – B
- Ketoconazole
- Fluconazole
- Itraconazole

UNIT-XIV: CARDIOVASCULAR DRUGS

- Inotropic drugs
- Dopamine
- Dobutamine
- Isoprenaline
- Antianginal drugs - Nitroglycerine
- Antiarrythmic drugs - Xylocard (Lignocaine), Procainamide, Amiodarone (cordarone)
- Digoxin
- Diuretics – Furosemide, Potassium sparing diuretics, Thiazides

UNIT-XV: DRUGS USED IN METABOLIC AND ELECTROLYTE IMBALANCE

- Glucose
- Bicarbonate
- Calcium
- Potassium

UNIT-XVI: ANTIINFLAMMATORY DRUGS

- Steroids
- Non steroidal anti-inflammatory drugs

UNIT-XVII: ANAESTHETIC DRUGS

- Muscle relaxants
- Local anaesthetic – Lignocaine / Lidocaines

RECOMMENDED BOOKS:

1. Essentials of medical pharmacology, KD Tripathi
2. Pharmacology for Dental & Allied health sciences, PadmajaUdayakumar

REFERENCE BOOKS:

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

4. PHARMACOLOGY RELATED TO RESPIRATORY CARE TECHNOLOGY-PRACTICAL(UE)

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

PRACTICALS / DEMONSTRATIONS:

1. **SPOTTERS**

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

2. **CHARTS**

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

PSYCHOLOGY (IE)

UNIT 1: Basic Concepts of Psychology

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

UNIT 2: Learning principles and methods

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

UNIT 3: Motivation, Emotion, Memory and forgetting

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

UNIT 4: Development, Sensory Processes and Perception.

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

UNIT 5: Intelligence & Personality

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

UNIT 6: Social Psychology

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

UNIT 7: Health Psychology

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

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

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

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler,"**Introduction to Psychology" – 7th Edition**. Tata McGraw Hill Book Co. New Delhi, 1993.

2. Baron, R. A., & Byrne, D (2006), "**Social psychology"**, New Delhi: Prentice hall of India private limited.

3.Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, **"Social psychology" 9th edition** published by Pearson education, Inc.,2006

4. Shelley E. Taylor. "**Health Psychology"Third Edition**.McGraw Hill International Editions, 1995.

5. Swaminathan, V.D, LathaSathish, "**Psychology for Effective Living"**, Department of Psychology, University of Madras.

6. Coleman, James. 1980. "**Abnormal Psychology and modern life"**. New Delhi: Tata McGraw Hill Ltd.

MEDICAL ETHICS AND BIOSAFETY (IE)

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

SEMESTER-IV

SL.NO	SUBJECT

1	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- Theory (UE)
2	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-I- practical (UE)
3	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- theory (UE)
4	Concepts of disease and outlines of clinical evaluation related to respiratory care technology paper-II- practical (UE)
5	Basics and advanced life support (IE)
6	Medical sociology (IE)

SEMESTER - IV

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

COURSE DESCRIPTION:

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

OBJECTIVE:

- To inculcate knowledge on various respiratory diseases and disorders.
- To elaborate on infections and their control while handling patients with respiratory illness

LEARNING OBJECTIVE SKILLS:

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

UNIT-I: INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

UPPER RESPIRATORY TRACT INFECTION

- Acute Rhinitis
- Acute Sinusitis
- Acute Pharyngitis
- LaryngoTracheitis
- Epiglotitis
- Acute otitis media

UNIT-II: LOWER RESPIRATORY TRACT INFECTION-I

- Bronchitis
- Pneumonia
- Pneumococcal pneumonia
- Staphylococcal pneumonia
- H.Influenza infection
- Klebsiella pneumonia
- Pseudomonas pneumonia
- Anaerobic pulmonary infection

UNIT-III: LOWER RESPIRATORY TRACT INFECTION-II

- Empyema
- Lung abscess
- Bronchiectasis
- Atypical pneumonia
- Viral pneumonia
- Mycobacterial infection
- Tuberculosis-Clinical features, diagnosis and treatment (Pulmonary and extra Pulmonary TB)
- Mycobacterial infection other than tuberculosis
- Aspergillus lung disease
- Nocardiosis
- Actinomycosis
- Tropical esinophilia
- Pulmonary infection and complication in HIV infected patients
- Hospital acquired pneumonia
- Ventilator associated pneumonia

UNIT-IV: NON INFECTIOUS DISEASE OF RESPIRATORY SYSTEM

- Thrombo embolic disease.
- Pulmonary hypertension
- Sleep apnoea,
- Alveolar hypoventilation
- Obesity hypoventilation

UNIT-V: OCCUPATIONAL LUNG DISEASES

- Environmental and occupational disease
- Silicosis.
- Coal workers pneumoconiosis.
- Asbestos related disease.
- Occupational asthma.
- Hypersensitivity pneumonitis.
- Idiopathic/immunologic/Granulomatous disease-sarcoidoisis.
- Benign neoplasm of lung - bronchial carinoids.
- Lung cancer - etiology, pathology, classification, staging, treatment

RECOMMENDED TEXT BOOKS:

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

REFERENCE BOOKS:

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

2. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY

PAPER I –PRACTICAL (UE)

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

PRACTICALS/DEMONSTRATIONS:

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

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3. CONCEPTS OF DISEASE AND OUTLINES OF CLINICAL EVALUATION RELATED TO RESPIRATORY CARE TECHNOLOGY

PAPER - II– THEORY(UE)

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

UNIT-I: AIRWAY DISEASES

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

UNIT-II: RESTRICTIVE LUNG DISEASES

- Acute Restrictive pathology
- Equal diminishment of all lung volumes
- Major diminishment of vital capacity
- Major diminishment of functional residual capacity
- Atelectasis
- Neuromuscular diseases
- Central nervous system depression

UNIT-III: DISEASES OF PLEURA

- Pleural effusion
- Pneumothorax

UNIT-IV: DISEASES OF MEDIASTINUM AND CHEST WALL

UNIT-V: CLINICAL EVALUATION OF THE PULMONARY SYSTEM

- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Assessment of portable chest x-ray, principle of x-rays, assessing the chest film.
- The application of pulmonary function studies, tidal volume, minute volume, FVC, negative inspiratory force, clinical importance.

UNIT-VI: PRINCIPLE IN THE ASSESSMENT OF PULMONARY PERFORMANCE

UNIT-VII: DISORDERS OF THE PULMONARY INTERSTITIUM

UNIT-VIII: LUNG IN SYSTEMIC DISORDERS

- RA
- SLE
- PSS

UNIT-IX: EFFECTS OF AIR POLLUTION ON LUNG

RECOMMENDED TEXT BOOKS:

1. Text book of pathology – Pocket Harsh Mohan's - 2nd edition, 2013

2. Basic pathology – Pocket Robbins – 7th edition, 2014

REFERENCE BOOKS:

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

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

COURSE DESCRIPTION:

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

OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Clinical evaluation of the pulmonary system
- Physical examination of the chest
- Observation
- Palpation
- Auscultation
- Abnormal findings
- Assessment of portable chest x ray
- Principle of x rays
- Assessing the chest film
- The application of pulmonary function studies
- Tidal volume
- Pulmonary rehabilitation

BASIC AND ADVANCED LIFE SUPPORT

1. BLS

2. TRIAGE

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

MEDICAL SOCIOLOGY

Unit 1: NATURE AND SCOPE OF SOCIOLOGY

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

Unit 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

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

Unit 3:CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

- Augustecomte, Emile Durkheim, Karl Marx, Max Weber, Herbert Spencer

Unit 4: SOCIOLOGY OF INDIA

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

Unit 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

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

Reference:

1. Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
2. Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications

3. Neil J.Smelser,Handbook of sociology,1988.sage publication
4. Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
5. Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
6. C.N.ShankarRao., Introduction to Sociology, 2008, S.CHAND & Company Publications.
7.C.N.ShankarRao., Sociology of India, S.CHAND & Company Publications.

SEMESTER-V

SL.NO	SUBJECT
1	Respiratory care technology Part I – Paper I – Theory(UE)
2	Respiratory care technology Part I – Paper I – Practical(UE)
3	Respiratory care technology Part I – Paper II – Theory(UE)
4	Respiratory care technology Part I – Paper II – Practical(UE)
5	Environmental science and Community medicine – Theory(IE)

SEMESTER-V

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

COURSE OBJECTIVE

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

LEARNING OBJECTIVE SKILLS:

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

UNIT I:

OXYGEN SUPPLY SYSTEM

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

OXYGEN ADMINISTRATION

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

OXYGEN THERAPY

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

- Hypoxemia (Physiologic causes of hypoxemia, Pulmonary response to hypoxemia, Cardiovascular response to hypoxemia, Hypoxemia and oxygen therapy) Internal respiration (Tissue hypoxemia, Dyoxia)

GOALS OF OXYGEN THERAPY

- Administration of oxygen ($FiO_{2,}$ Gas delivery systems)

CLINICAL GUIDELINES FOR OXYGEN THERAPY

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

OXYGEN AS A DRUG

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

UNIT II:

HYPOXEMIA AND OXYGEN THERAPY

- Refractory hypoxemia: Clinical relevance

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

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

UNIT III:

PULMONARY FUNCTION TESTING EQUIPMENTS

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

COMPUTERS IN THE PULMONARY FUNCTION LABORATORY
QUALITY ASSURANCE IN THE PULMONARY FUNCTION LABORATORY

AFFECTING FACTORS – ANALYTICAL – NON ANALYTICAL

INTERPRETING RESULTS & REPORTING

PULMONARY FUNCTIONS TESTS

- Lung volume test
- Ventilation and "ventilatory control test"
- Pulmonary mechanics using spirometer
- Gas distribution test using He dilution, N_2 , washouts, body plethysmography
- Dilution factor for carbon monoxide
  - Single breath method
  - Steady state methods
- Blood gas analysis, capnography and related test
- Exercise testing – 6-minute walk test, sit-to-stand test, shuttle walk test, CPET
- Specialized test, non invasice 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 (Tidal volume, minute ventilation, forced vital capacity, negative inspiratory force, clinical interpretation)

UNIT IV:

DIAGNOSTIC PROCEDURES

- Bronchoscopy(Rigid bronchoscope, Flexible fiber optic bronchoscope, Equipment maintenance Transbronchial lung biopsy, Bronchoalveolar lavage, Pediatric bronchoscope)
- Fluoroscopy
- Lung biopsy(Percutaneous fine needle biopsy, Open cut biopsy, needle biopsy of pleura)
- Thoracoscopy
- Mediastinoscopy
- Transtracheal aspiration

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

UNIT V:

ARTERIAL BLOOD GAS ANALYSIS – Evaluate/Acid base homeostasis

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

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

COURSE OBJECTIVE:

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

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Oxygen delivery devices
- Bronchoscope
- Thoracoscope
- Lung biopsy needles
- ICD tube
- Spirometer
- PFT interpretation
- ABG interpretation
- Chest X-Rays

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

COURSE DESCRIPTION:

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

LEARNING OBJECTIVE SKILLS:

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

UNIT I:PULMONARY OEDEMA

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

UNIT II:ACUTE LUNG INJURY

- Parenchymal responses to injury

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

UNIT III:TOXIC INHALATION

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

UNIT IV: PULMONARY REHABILITATION

- Home rehabilitation
- Home oxygen administration
- Oxygen concentrator
- Smoking cessation

- Muscle Strengthening Exercises
- Yoga therapy

UNIT V:LUNG TRANSPLANTATION

UNIT VI: BASIS OF ASEPSIS

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

RECOMMENDED TEXT BOOKS:

REFERENCE BOOKS:

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

4. RESPIRATORY CARE TECHOLOGY PART – I PAPER – II - PRACTICAL(UE)

COURSE OBJECTIVE:

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

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Universal precaution materials
- ARDS lung
- Pulmonary edema lung
- Oxygen concentrator
- Smoking cessation
- PEEP therapy

ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE

UNIT-I

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

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

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

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

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

- **Concept of health &disease**:Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of well being, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of

disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Modes of Intervention, Changing pattern of disease.

- **Epidemiology**: Definition & Explanation, Aims, Epidemiologic approach, Basic measurement in epidemiology & tools of measurement – of Mortality , Epidemiologic methods – Descripitive epidemiology – Analytical epidemiology -Cohort study – Expiremental epidemiology – RCT- Association & Caution Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Mode of Transmission – Disinfection – Definitions Types Agents used Recommended disinfection procedures – Investigation of an epidemic.
- **Environmental & health:** Definition & Components (environment sanitation environmental sanitation) Water : Safe & Whole some water Requirements Uses source of water supply (sanitary well) – Purification (1).Large scale purification, (2). Small scale purification – Water quality – Special treatment of water Air: Composition the air of occupied room discomfort.

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

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

SEMESTER - VI

SL.NO	SUBJECT
1	Respiratory care technology Part II - Paper- I – Theory(UE)
2	Respiratory care technology Part II - Paper- I – Practical(UE)
3	Respiratory care technology Part II - Paper- II – Theory(UE)
4	Respiratory care technology Part II - Paper- II – Practical(UE)
5	Healthcare and basic principles(IE)

SEMESTER VI

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

COURSE OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

UNIT I: BRONICAL HYGIENE THERAPY RETAINED SECRETIONS

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

UNIT II: HUMIDITY AND AEROSAL THERAPY

- Humidity
- Airway humidification, humidifiers, clinical applications of humidifiers

- Aerosols
- Aerosol stability, penetration and deposition, water content, airway resistance
- Clearance of aerosols, aerosol generators, aerosol delivery devices, nebulizer
- Goals of aerosol therapy
- Jet nebulizer, hydrodynamic nebulizer, ultrasonic nebulizer
- Aid to bronchial hygiene therapy, humidification of inspired gases, delivery medications
- Administration of aerosol therapy
- Swelling of retained secretions, precipitation of bronchospasm, fluid overload, cross contaminations.

UNIT III: CHEST PHYSICAL THERAPY

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

IPPB THERAPY

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

UNIT IV: HEMOSTASIS

- Hemodynamic monitoring
- ECG arrhythmias diagnosis
- Bedside interpretation of ECG tracing
- Central venous pressure monitoring

- Thermo dilation cardiac output
- Cardiopulmonary resustation techniques

UNIT V: SLEEP RELATED MOVEMENT DISORDERS AND EMG MONITORING

The student will learn an overview of muscular structure and function as it relates to sleep, specifics regarding the lower extremities, chin and upper airway. This information will be a precursor for the discussion of periodic limb movement disorder (PLMD) and restless leg syndrome (RLS). A presentation of the criteria for scoring periodic limb movements and how to chart the findings will be discussed in this course.

NARCOLEPSY, SLEEP RELATED SEIZURES AND PARASOMNIAS

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

MSLT AND MWT

The student will learn specific sleep testing protocols used in the assessment of disorders of excessive daytime somnolence. Disorders such as narcolepsy or idiopathic central nervous system hypersomnia can be evaluated by the combination of night time polysomnography followed by a multiple sleep latency test (MSLT) starting the following morning. The test measures the time it takes to fall asleep when the opportunity is presented. An alternative to the MSLT is the maintananace of wakefulness test (MWT) which investigates how long wakefulness can be maintained. Electrode placement, complex procedural information and scoring criteria will be discussed

INSOMNIA, CIRCADIAN RHYTHM

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

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Principles and practices of sleep medicine – William Dement.
- George Mathew.K Medicine Prep manual 1st edition. B.I Churchill Livingstone Pvt Ltd. New delhi1995
- Scot Irwin, Jan Stephen tecklin, Cardiopulmonary Physical therapy, a guide to practice, 3rd edition, mosby, USA.
- Donna Frownfelter, Elizabeth Dean (eds) Principles and practices of cardiopulmonary physical therapy, 3rd Mosby, USA.
- Craig L, Scanlan, Egan's Fundamentals of Respiratory care, 6th edition Mosby, 1995.
- Stevansadowsky, H Ellan, A Hillegas, Essential of Cardiopulmonary physical therapy, W.B saunders company USA.
- John F Murray, Jay A Nadel, Text book of Respiratory Medicine, 2nd edition W.B saunders company USA.
- Braunwald (edr), Heart disease, A text book of cardiovascular medicine, 4th edition, W.B saunders company, USA 1992.
- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

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

COURSE OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

- Will be able to identify the respiratory diseases with clinical symptoms.

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

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

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

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

COURSE OBJECTIVE:

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

- Demonstrate competent ability and assume the responsibility of transportation of critically ill.

LEARNING OBJECTIVE SKILLS:

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

UNIT I: AIRWAYS

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

UNIT II: MAINTENANCE OF ARTIFICIAL AIRWAYS & EXTUBATION

- Endotracheal tube Vs Tracheostomy
- Contamination of airway
- Diagnosis of airway
- Incidence of airway contamination

- Common airway contamination
- Nosocomial infections in the respiratory care
- Suctioning the airway
- Complications of the airways
- The suction catheter
- Suction techniques
- Suctioning adaptors
- Obtaining culture specimens
- Humidification of the airways
- Tracheostomy wound care
- Cuff care
- Inflation technique
- Periodic deflation
- Artificial airways emergencies
- Cuff leaks
- Inadvertent extubation

UNIT III: LARYNGEAL AND TRACHEAL COMPLICATIONS OF ARTIFICIAL AIRWAYS

- Laryngeal complications of endo-tracheal intubation, sore throat and horse voice
- Glottis edema, sub-glottic edema, ulceration of vocal cards, tracheal mucosa, tracheal stenosis

UNIT-IV: INTUBATION OF ADULT PATIENTS ELECTIVE/EMERGENCY VENTILATOR MANAGEMENT

- Adult patients
- Trouble shooting
- Ventilator control
- Goals and complications of the ventilator

- Indications of the ventilator
- Weaning from mechanical ventilators
- Modern mechanical ventilators
- Non-invasive ventilators
- Adult ventilator management

UNIT V: INTENSIVE CARE UNIT

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

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White

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

COURSE OBJECTIVE:

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

LEARNING OBJECTIVE SKILLS:

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

PRACTICALS/DEMONSTRATIONS:

CHARTS/SPOTTERS:

- Artificial airways
- Endotracheal tubes
- Nasotracheal tubes
- Suction catheter
- Tracheostomy tubes
- Laryngoscope
- CPAP/BiPAP
- Capnography

REFERENCE BOOKS:

- Egans Fundamentals of respiratory care.
- Respiratory care exam review – Gary Persing.
- Basic clinical lab competencies for respiratory care – Gary C White
- Principles and practices of sleep medicine – William Dement.
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- Shoemaker, Ayres, Greenvik, Holbrook, Text book of critical care, 4th edition, W.B saunders company 1984.

5. HEALTH CARE AND BASIC PRINCIPLES

1. Concept of Health Care and Health Policy

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

2. Health Organization

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

3. Health Policy and National Health Programme

- National Health Policy

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

4. Health Economics

Fundamentals of Economics

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

5. Methods & Techniques of Economic Evaluation of Health Program

- Cost Benefit & Cost Effective Methods

6. Household & Health

Health Expenditure & Outcome

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

7. Economics of Health

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

8.Health Insurance

SEMESTER-VII

SL.NO	SUBJECT
1	Project/ Dissertation
2	Statistics and research methodology

SEMESTER-VII

BIOSTATISTICS AND RESEARCH METHODOLOGY

1. **What is statistics** – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behaviouralsciences.
2. **Measurements** – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.
3. **Data collection** – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.
4. **Cumulative frequency curve** – Ogives – Drawing inference from graph.
5. **Measures of central tendency** – Need – types: Mean, Median, Mode – Working out these measures with illustrations.
6. **Measures of variability** – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.
7. **Normal distribution** – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

8. **Variants from the normal distribution** – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.
9. **Correlation** – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.
10. **Tests of significance**- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.