

**REGULATIONS AND CURRICULUM OF  
B.Sc, EMERGENCY AND TRAUMA CARE TECHNOLOGY -2020**



**Rajiv Gandhi University of Health Sciences,  
Karnataka, Bangalore**

# Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

## The Emblem



The Emblem of the Rajiv Gandhi University of Health Sciences is a symbolic expression of the confluence of both Eastern and Western Health Sciences. A central wand with entwined snakes symbolises Greek and Roman Gods of Health called Hermis and Mercury is adapted as symbol of modern medical science. The pot above depicts Amrutha Kalasham of Dhanvanthri the father of all Health Sciences. The wings above it depicts Human Soul called Hamsa (Swan) in Indian philosophy. The rising Sun at the top symbolises knowledge and enlightenment. The two twigs of leaves in western philosophy symbolises Olive branches, which is an expression of Peace, Love and Harmony. In Hindu Philosophy it depicts the Vanaspathi (also called as Oushadi) held in the hands of Dhanvanthri, which are the source of all Medicines. The lamp at the bottom depicts human energy (kundalini). The script “Devahitham Yadayahu” inside the lamp is taken from Upanishath Shanthi i Manthram (Bhadram Karnebh i Shrunuyanadev...), which says “May we live the full span of our lives allotted by God in perfect health” which is the motto of the Rajiv Gandhi University of Health Sciences.



ರಾಜೀವ್ ಗಾಂಧಿ ಆರೋಗ್ಯ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು  
RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BENGALURU  
4<sup>th</sup> T Block, Jayanagar, Bengaluru - 560 041

Ref: ACA/DCD/New Courses/23/2018-19

Date: 19/08/2020

**NOTIFICATION**

Sub: Change in Nomenclature of the course from B.Sc., Emergency Medicine Technology to B.Sc., Emergency and Trauma Care Technology.

- Ref: 1. Proceedings of the meeting of committee to start New courses held on 13.12.2018.  
2. Minutes of 140<sup>th</sup> Syndicate meeting held on Dt: 27.02.2019.  
3. Notification No: RGU/AUTH/140-SYN/117-5/DCD/2018-19 Dt: 09-04-2019.  
4. Minutes of 151<sup>st</sup> Syndicate meeting held on 07.08.2020.

The course B.Sc., Emergency Medicine Technology has been Notified as per reference (3). Subsequently, as per reference (4) the nomenclature of the above course is changed to B.Sc., Emergency and Trauma Care Technology

In exercise of the powers vested under Section 35(1) of RGUHS Act, 1994, and as per approval of the Syndicate in its 151<sup>st</sup> meeting held on 07.08.2020, University is pleased to notify the Change in Nomenclature of the course from B.Sc., Emergency Medicine Technology to B.Sc., Emergency and Trauma Care Technology.

The earlier Notification RGU/AUTH/140-SYN/117-5/DCD/2018-19 Dt: 09-04-2019 is withdrawn herewith.

  
**REGISTRAR**

To

The Principals of all Allied Health Science Course colleges affiliated to RGUHS, Bangalore.

Copy to:

1. The Principal Secretary to Governor, Raj Bhavan, Bangalore - 560001
2. The Principal Secretary Medical Education, Health & Family Welfare Dept., M S Building, Dr.B.R. Ambedkar Veedhi, Bangalore - 01
3. PA to Vice - Chancellor/PA to Registrar/Registrar (Eva.)/Finance Officer, Rajiv Gandhi University Health Sciences, Bangalore
4. All Officers of the University Examination Branch/ Academic Section.
5. RGUHS Website.
6. Guard File / Office copy

## REGULATIONS

### **B.Sc, EMERGENCY AND TRAUMA CARE TECHNOLOGY COURSE SHALL BE CONDUCTED IN A MEDICAL COLLEGE**

**1. Eligibility for admission:** A candidate seeking admission to the Bachelor of Science – Emergency and Trauma Care Technology Degree, shall have studied in English medium for the qualifying examination and shall have passed:

a) Two-year Pre-University examination or equivalent as recognized by RGUHS with Physics, Chemistry and Biology as principal subjects of study.

OR

b) Pre-degree course from a recognized university considered as equivalent (two years after ten years of schooling) with Physics, Chemistry and Biology as principal subjects of study.

OR

c) Any equivalent examination recognized by RGUHS for the above purpose, with Physics, Chemistry and Biology as principal subjects of study.

Or

d) **In case of B.Sc. - Emergency and Trauma Care Technology, a candidate who has completed a** Diploma in General Nursing and Midwifery (GNM) program or equivalent course and has a valid registration with the respective State Nursing Council shall be eligible for lateral entry to the Second year of the course.

Note: i. The candidate shall have passed individually in each of the principal subjects.

ii. **Candidates who have completed diploma or vocational course through correspondence shall not be eligible for any of the courses mentioned above.**

#### **1. Duration of the course:**

Duration shall be for a period of four years which includes One year of internship.

#### **2. Medium of instruction:**

The medium of instruction and examination shall be in English.

#### **3. Attendance:**

Candidates should have attended at least 75% of the total number of classes conducted in an academic year, from the date of commencement of the term to the last working day, as notified by the University, in each of the subjects prescribed for that year, separately in theory and practical, to be eligible to appear for the university examinations. Candidates lacking in prescribed percentage of attendance in any subject, either in theory or practical, in the first appearance, will not be eligible to appear for the university examination in that subject, unless they put in the required attendance, to appear in the subsequent examinations.

#### **4. Internal assessment (IA):**

There shall be a minimum of three periodical tests in theory and practical of each subject spread over evenly in an academic year. The average marks of the best two tests will be calculated and after reducing the marks suitably as specified under IA in table IV, V & VI, taken as IA in that subject. The marks of IA shall be communicated to the university at least 15 days before the commencement of the university examination. The university shall have access to the records of such periodical tests. Candidates have to secure 35% marks in the IA in each subject to become eligible to appear in the university examination. The marks of the internal assessment must be displayed on the notice board of the respective colleges within a fortnight from the

date test is held. If a candidate is absent for any of the tests due to genuine and satisfactory reasons, such a candidate may be given a re-test, within a fortnight of the test.

### 5. Subject and hours of teaching for theory and practicals:

The number of hours of teaching theory and practical, subject wise in first year, second year and third year are shown in table I, table II and table III. Main and subsidiary subjects are common in first year for all the courses in Allied Health Sciences.

**TABLE I: Distribution of subjects and number of hours of teaching in first year.**

Sl No	Subject	Theory No. of hours	Practical No. of hours	Total no. of hours
<b>A</b>	<b>Main subjects</b>			
1	Human anatomy	50	20	70
2	Physiology	50	20	70
3	Biochemistry-I	50	20	70
4	Pathology-I	50	20	70
5	Microbiology-I	50	20	70
	<b>Total</b>	<b>250</b>	<b>100</b>	<b>350</b>
<b>B</b>	<b>Subsidiary subjects</b>			
1	English	25	-	-
2	Kannada	25	-	-
3	Health-care	40	-	-

**Note:** a) The classes in main and subsidiary subjects are to be held from Monday to Friday.  
9am - 4 pm

**TABLE II: Distribution of subjects and number of hours of teaching in second year.**

Sl. No.	Subject	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
<b>A</b>	<b>Main Subjects</b>				
1	Introduction to Emergency Medical Services	50	50	250	350
2	Emergency Department Equipment	50	50	250	350
3	Emergency Department Pharmacology	50	50	250	350
	<b>Total</b>	<b>150</b>	<b>150</b>	<b>750</b>	<b>1050</b>
<b>B</b>	<b>Subsidiary subjects</b>				
1	Sociology	20			
2	Constitution of India	10			
3	Environmental Science & Health	10			

**Table III: Distribution of Teaching Hours in Third Year Subjects.**

Sl. No.	Subjects	Theory No. of Hours	Practical No. of Hours	Clinical posting	Total No. of Hours
<b>A</b>	<b>Main Subjects</b>				
1	Medical emergencies	50	50	250	350
2	Trauma and surgical emergencies	50	50	250	350
3	Emergencies in pediatric and special population	50	50	250	350
	<b>Total</b>	<b>150</b>	<b>150</b>	<b>750</b>	<b>1050</b>
<b>B</b>	<b>Subsidiary subjects</b>				
1	Ethics	20			
2	Research and Biostatistics	10			
3	Computer application	10			

**6) Schedule of Examination:**

- The University shall conduct two annual examinations, one at the end of each year, as notified by the university. A candidate who satisfies the requirement of attendance, internal assessment and conduct as stipulated by the university shall be eligible to appear for the university examination. Certificate to that effect shall be produced from the Head of the Institution along with the application for examination and the prescribed fee. Supplementary examination shall be conducted by the university between 4-6 months from the date of the annual examinations.
- Examination for subsidiary subjects shall be conducted by respective colleges and the results and marks obtained shall be submitted to the University along with the IA marks of main subjects.

**6. Scheme of Examination:**

Distribution of subjects and marks for first year and second year theory and practical examinations are shown in the Table – III and IV.

**Table IV: Distribution of Subjects and marks for First Year theory Examination**

		Written Paper		I A Theory	Total
		Duration	Marks	Marks	Marks
<b>A</b>	<b>Main Subjects</b>				
1	Basic Anatomy (Including Histology)	3 hours	100	20	120
2	Physiology	3 hours	100	20	120
3	Biochemistry-I	3 hours	100	20	120
4	Pathology-I	3 hours	100	20	120
5	Microbiology-I	3 hours	100	20	120
<b>B</b>	<b>Subsidiary Subjects</b>				
1	English	3 hours	80	20	100
2	Kannada	3 hours	80	20	100
3	Health Care	3 hours	80	20	100

**Note :**

- The examination for both main and subsidiary subjects for all courses in Allied Health Sciences shall be common in the first year. The university examination for first year shall consist of only theory examination and there shall be no university practical examination.
- IA=Internal Assessment
- Main subjects shall have University examination.
- Examination for subsidiary subjects shall be conducted by respective colleges.

**TABLE V: Distribution of subjects and marks for Second year examination.**

Paper	Subjects	Theory			Practical			Grand Total
		Uni Exam	IA	Sub Total	Uni Practica I	IA	Sub Total	
<b>A</b>	<b>Main Subjects</b>							
1	Introduction to Emergency Medical Services	100	20	120	80	20	100	220
2	Emergency Department Equipment	100	20	120	80	20	100	220
3	Emergency Department Pharmacology	100	20	120	80	20	100	220
<b>B</b>	<b>Subsidiary Subjects</b>	Duration		Marks	IA Theory Marks		Total Marks	
1	Sociology	3 hours		80	20		100	
2	Constitution of India	3 hours		80	20		100	
3	Environmental Science & Health	3 hours		80	20		100	

**Note:** Examination for subsidiary subjects shall be conducted by respective colleges.

**TABLE VI: Distribution of subjects and marks for Third year examination.**

Paper	Subjects	Theory			Practical			Grand Total
		Uni Exam	IA	Sub Total	Uni Practica I	IA	Sub Total	
<b>A</b>	<b>Main Subjects</b>							
1	Medical Emergencies	100	20	120	80	20	100	220
2	Trauma and surgical emergencies	100	20	120	80	20	100	220
3	Emergencies in pediatric and special population	100	20	120	80	20	100	220
<b>B</b>	<b>Subsidiary Subjects</b>	Duration		Marks	IA Theory Marks		Total Marks	
1	Ethics	3 hours		80	20		100	
2	Research & Biostatistics	3 hours		80	20		100	
3	Computer application	3 hours		80	20		100	

**Note:** Examination for subsidiary subjects shall be conducted by respective colleges.

## 7. Question Paper pattern:

### For 100 marks question paper

Type of Questions	No of Questions	Marks For Each Questions	Total
Long Essay	2	10	20
Short Notes	10	05	50
Short Answers	10	03	30

### 10. Practical Examination.

A) THERE SHALL BE NO UNIVERSITY PRACTICAL EXAMINATION IN THE FIRST YEAR.

B) PRACTICAL EXAMINATION (2ND YEAR):

#### Paper I- Introduction to Emergency Medical Services

SI No	Tests	Marks
1	Preparation of an ambulance	20
2	Problems based on triage	20
3	Basic life support skills	40
	<b>Total</b>	<b>80</b>

#### Paper II-- Emergency Department Equipment

SI No	Tests	Marks
1	Application/ connection to patient, usage, calibration, changing settings, demonstrating maintenance of equipment (10 marks x 8 equipment)	80
	<b>Total</b>	<b>80</b>

#### Paper III- Emergency Department Pharmacology

SI No	Tests	Marks
1	Problems based on drug dosage calculation	20
2	Demonstration of strategies to reduce medication error (Role-play)	20
3	Preparation of IV injection/ infusion	40
	<b>Total</b>	<b>80</b>

C) PRACTICAL EXAMINATION 3<sup>RD</sup> YEAR: ONE COMMON PRACTICAL FOR ALL THE THREE PAPERS WITH EQUAL WEIGHTAGE OF MARKS. 80 MARKS X 3 = 240 MARKS

#### Paper I- Medical Emergencies (Third year)

SI No	Tests	Marks
1	Preparing an ambulance for medical emergency	20
2	Responding to a call and scene management of medical emergency	20
3	Receiving and resuscitating a patient with a medical emergency in the emergency medicine department	40
	<b>Total</b>	<b>80</b>



**Paper II-- Trauma and surgical emergencies ( Third year)**

SI No	Tests	Marks
1	Preparing an ambulance for trauma	20
2	Responding to a call and scene management of trauma	20
3	Receiving and resuscitating a patient with trauma in the emergency medicine department	40
	<b>Total</b>	<b>80</b>

**Paper III- Emergencies in pediatric and special population (Third year)**

SI No	Tests	Marks
1	Airway management and resuscitation of an infant	20
2	Airway management and resuscitation of a child	20
3	OSCE	40
	<b>Total</b>	<b>80</b>

**11) Board of Examiners:**

Practical examination will be conducted by two examiners out of which one will be external examiner recognized by the university.

**11. Criteria for pass:**

- Main Subjects:** Candidates are declared to have passed in a subject, if they secure 50% of marks in university examination and internal assessment added together. Theory & practical shall be considered to be separate subjects. If a candidate passes in practical examination but fails in one or more theory papers, such candidate is exempted from reappearing for practical but shall have to appear in the subsequent examination for the theory paper in which the candidate has failed OR vice versa.
- Subsidiary Subjects:** The minimum prescribed marks for a pass in subsidiary subject shall be 40% of the maximum marks prescribed for a subject. The marks obtained in the subsidiary subjects shall be communicated to the university before the commencement of the university examination.

**12. Declaration of class:**

- A candidate, who passes all the main subjects in the first attempt, securing 75% marks or more (aggregate), shall be declared to have passed the examination with **Distinction.**
- A candidate who passes all the main subjects in the first attempt, securing 65% marks or more, but less than 75% (aggregate), shall be declared to have passed the examination with **First Class.**
- A candidate who passes all the main subjects in the first attempt, securing 60% marks or more, but less than 65% (aggregate), shall be declared to have passed the examination with **Second Class.**
- A candidate who passes all the main subjects in the first attempt, securing 50% marks or more, but less than 60% (aggregate), shall be declared to have passed the examination with **Pass Class.**

e) A candidate passing university examination in more than one attempt shall be placed in **Pass class** irrespective of the percentage of marks secured.

f) Marks obtained in the subsidiary subjects shall have no bearing on the class declaration.

### **13. Carry over**

A candidate who fails in main subjects and /or subsidiary subjects of first year and/ or second year shall be permitted to carry over those subjects up to final year. However, the candidate must pass the carry over subjects before appearing for final year university examination.

### **14. Award of degree**

A candidate who has passed in all the main and subsidiary subjects of first, second and third year and has successfully completed the internship shall be eligible for award of degree.

### **15. Maximum duration for completion of course**

A candidate shall complete the course within six years from date of admission, failing which re-registration shall be mandatory.

----

# SYLLABUS

## MAIN SUBJECTS

### First Year B.Sc. EMERGENCY AND TRAUMA CARE TECHNOLOGY ANATOMY

#### 1. Introduction: Human body as a whole

a) **Theory:**

Definition of anatomy and its divisions.

Terms of location, positions and planes.

Cell and its organelles.

Epithelium: definition, classification, describe with examples, function.

Glands: classification, describe serous, mucous and mixed glands with examples.

Basic tissues: classification with examples

b) **Practical:**

Histology of types of epithelium.

Histology of serous, mucous & mixed salivary gland

#### 2. Locomotion and support

a) **Theory:**

Cartilage: types with example & histology.

Bone: classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, inter-vertebral disc, fontanelles of fetal skull.

Joints: classification of joints with examples, synovial joint (in detail for radiology).

Muscular system: classification of muscular tissue & histology, names of muscles of the body.

b) **Practical:**

Histology of the 3 types of cartilage.

Demo of all bones showing parts, radiographs of normal bones & joints.

Histology of compact bone (TS & LS).

Demonstration of all muscles of the body.

Histology of skeletal, smooth & cardiac muscle (TS & LS).

#### 3. Cardiovascular system

a) **Theory:**

Heart: size, location, chambers, exterior & interior, blood supply of heart.

Systemic & pulmonary circulation, branches of aorta.

b) **Practical:**

Demonstration of heart and vessels in the body.

Histology of large artery, medium sized artery & vein, large vein.

Histology of lymph node & tonsil.

Normal chest radiograph showing heart shadows.

Normal angiograms.

#### 4. Gastro-intestinal system

a) **Theory:**

Parts of GIT, oral cavity, tongue (with histology), tonsil, dentition, pharynx, salivary glands, esophagus, stomach, small and large intestine, liver, gall bladder, pancreas,

radiographs of abdomen.

**b) Practical :**

Demonstration of parts of gastro intestinal system.

Normal radiographs of gastro intestinal system.

**5. Respiratory system**

**a) Theory:**

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, broncho-pulmonary segments, histology of trachea, lung, names of paranasal air sinuses.

**b) Practical :**

Demonstration of parts of respiratory system.

Normal radiographs of chest.

Histology of lung and trachea

**6. Urinary system**

**a) Theory:**

Kidney, ureter, urinary bladder, male and female urethra.

**b) Practical:**

Demonstration of parts of urinary system.

Histology of kidney, ureter, urinary bladder.

Radiographs of abdomen-IVP.

**7. Reproductive system**

**a) Theory:**

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology).

Mammary gland: gross.

**b) Practical:**

Demonstration of section of male and female pelvis with organs in situ.

Histology of testis, ovary.

Radiographs of pelvis, hystero-salpingogram.

**8. Endocrine glands**

**a) Theory:**

Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (gross & histology).

**b) Practical:**

Demonstration of the glands.

**9. Nervous system**

**a) Theory:**

Neuron, classification of nervous system, cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology), meninges, ventricles & cerebrospinal fluid, names of basal nuclei, blood supply of brain, cranial nerves.

**b) Practical:**

Demonstration of all parts of brain.

## 10. Sensory organs:

### a) Theory:

Skin: histology, appendages of skin.

Eye: parts of eye & lacrimal apparatus. Parts of ear: external, middle and inner ear and contents.

### b) Practical:

Histology of thin and thick skin.

Demonstration and histology of eyeball.

## 11. Embryology:

### a) Theory:

Spermatogenesis & oogenesis.

Ovulation, fertilization.

Placenta.

### b) Practical:

Demonstration of models.

## REFERENCE BOOKS

1. William Davis (P): Understanding Human Anatomy and Physiology MC Graw Hill
2. Chaurasia: A Text book of Anatomy
3. T.S. Ranganathan: A text book of Human Anatomy
4. Fattana: Human anatomy(Description and applied) Saunder's & C P Prism Publishers, Bangalore – 1991
5. Ester M Grishcimer: Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia.
6. Bhatnagar: Essentials of Human embryology. Revised Edition Orient Blackswan Pvt. Ltd.

## PHYSIOLOGY

### Theory

#### a. GENERAL PHYSIOLOGY

ORGANIZATION OF THE CELL AND ITS FUNCTIONS

TRANSPORT ACROSS CELL MEMBRANE

MEMBRANE POTENTIALS - RESTING MEMBRANE POTENTIAL &  
ACTION POTENTIAL

BODY FLUID COMPARTMENTS - NORMAL VALUES

HOMEOSTASIS

#### b. Blood

Introduction: composition and function of blood.

Red blood cells: erythropoiesis, stages of differentiation, function, count, physiological variation.

Structure, function, concentration, physiological variation, methods of estimation of haemoglobin.

White blood cells: production, function, count.

Platelets: origin, normal count, morphology functions.

Plasma proteins: types, functions

Haemostasis: definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting Blood groups: ABO system, Rh system.

Blood grouping & typing, cross matching.

Rh system: Rh factor, Rh incompatibility.

Blood transfusion: indication.

transfusion reactions.

Anticoagulants: classification, examples and uses.

Anaemias: morphological and etiological classification, Blood indices: CI, MCH, MCV, MCHC.

Erythrocyte sedimentation rate (ESR) and packed cell volume, normal values.

Blood volume: normal value, determination of blood volume and regulation.

Body fluid: pH, normal value.

Lymph: composition and function of lymph.

### **c. Muscle nerve physiology**

Classification of muscle, structure of skeletal muscle,

Neuromuscular junction. Transmission across neuromuscular junction. Excitation contraction coupling. muscle tone, fatigue, rigor mortis

### **d. Digestive System**

Physiological anatomy of gastro intestinal tract, functions of digestive system.

Salivary glands: structure and functions, deglutition: stages and regulation.

Stomach: structure and functions.

Gastric secretion: composition function regulation of gastric juice secretion.

Pancreas : structure, function, composition of pancreatic juice

Functions of liver. Bile secretion, composition, function. jaundice: types.

Functions of gall bladder.

Small intestine: functions, digestion, absorption, movements.

Large intestine: functions, movements defecation digestion and absorption of carbohydrates, proteins, fats, lipids. role of gastrointestinal hormones on digestion

### **e. Excretory System**

Functions of kidneys, nephron, vasa recta, cortical and juxtamedullary nephrons, comparison, juxta glomerular apparatus: structure and function. Mechanism of urine formation: ultrafiltration gfr, Determination of GFR. selective reabsorption –sites, mechanism and substance reabsorption, (glucose, urea, H<sup>+</sup>, Cl<sup>-</sup> aminoacids sodium, potassium, etc.)

Counter-current mechanisms :micturition, innervation of bladder, cystometrogram.

artificial kidney, renal function tests: plasma clearance, actions of ADH, aldosterone and PTH on kidneys.

### **f. Respiratory system**

Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract, respiratory muscles.

Mechanism of normal and rigorous respiration, forces opposing and favoring expansion of the lungs. Intra pulmonary & intrapleural pressure. surface tension, recoil tendency of the thoracic cage and lungs .

Transport of respiratory gases: transport of oxygen & carbon dioxide, oxy haemoglobin dissociation curve factors affecting it.

Lung volumes and capacities –normal values

Regulation of respiration: mechanisms of regulation, nervous and chemical regulation, respiratory centre,

Applied physiology : hypoxia, cyanosis, dyspnoea, apnoea.

**g. Cardiovascular system**

Heart: physiological anatomy, nerve supply.

Properties of cardiac muscle, cardiac cycle:

Cardiac output (only definitions of stroke volume, cardiac index )

normal heart sounds, areas of auscultation.

Blood pressure: definition, normal value, clinical measurement of blood pressure, hypotension, hypertension.

Physiological variations & regulation of heart rate,

Pulse: jugular, radial pulse,

Electrocardiogram (ECG) waves and normal duration

**h. Endocrine System**

classification of endocrine glands & Definition of hormone.

Pituitary hormones: anterior and posterior pituitary hormones, secretion, functions

Thyroid gland: physiological anatomy, hormone secreted, physiological function, regulation, secretion, disorders ( hypo and hyper secretion of hormone).

Adrenal cortex: physiological anatomy. cortical hormones, functions and regulation.

Adrenal medulla: hormones, regulation and secretion. Functions of adrenaline and nor adrenaline.

Hormones of pancreas.

Insulin: secretion, regulation, function and action.

Diabetes mellitus: regulation of blood glucose level.

Parathyroid gland: function, action, regulation of secretion of parathyroid hormone.

Calcitonin: functions and action.

**i. Reproductive system**

Male reproductive system: functions of testes, spermatogenesis: Endocrine functions of testes

Female reproductive system: oestrogen, progesteron menstrual cycle: ovulation, physiological changes during pregnancy, pregnancy tests.

Lactation: composition of milk, factors controlling lactation.

**j. Nervous system**

Functions of nervous system, structure, classification and properties of neuron and neuroglia

classification of nerve fibers

Synapse: structure, types, properties.

Receptors: definition, classification, properties.

Reflex : definition reflex arc, clinical classification of reflexes : Babinski's sign.

organization Spinal cord. Ascending tracts, descending tracts.

Pyramidal tracts - functions

Extrapyramidal tracts - functions

hypothalamus- functions

Cerebral cortex lobes -functions,

cerebellum- functions

Basal ganglion: functions.

EEG.

Cerebro Spinal Fluid(CSF) : formation, circulation & reabsorption . composition and functions. Lumbar puncture.

Autonomic Nervous System:

Sympathetic and parasympathetic distribution

**k. Special senses**

Vision: structure of eye, function of different parts.

Structure of retina. visual pathway, errors of

refraction  
Hearing: structure and functions of ear.  
Taste : taste buds and taste pathway.  
olfaction : receptors, pathway.

## **1. Skin**

Structure and functions, regulation of body temperature

### **Practicals**

1. Haemoglobinometry.
2. total leucocyte count.
3. Total Red blood cell count.
4. Determination of blood groups.
5. differential WBC count.
6. Erythrocyte sedimentation rate (ESR). Determination of packed cell Volume, Calculation of blood indices
7. Determination of clotting time, bleeding time.
8. Blood pressure recording.
9. Auscultation for heart sounds.
10. spirometry, artificial respiration

### **REFERENCE BOOKS**

1. Guyton (Arthur): Text Book of Physiology.Latest Ed. Prism publishers.
2. Chatterjee CC: Human Physiology Latest Ed.Vol-1, Medical Allied Agency.
3. Choudhari Sujith K: Concise Medical Physiology Latest Ed. New Central Book.
4. Ganong William F: Review of Medical Physiology. Latest Ed. Tata McGraw.

## **BIOCHEMISTRY**

### **Theory:**

- a. Introduction to Biochemistry**
- b. Blood chemistry-Biochemical components.Normal reference ranges.diseased states.**
- c. Urine chemistry- Biochemical components.Normal reference ranges.diseased states**
- d. Specimen collection:**

Collection of blood, CSF, urine & other fluids  
Use of preservatives, Anticoagulants  
Method of transport , packing and storing of specimens,  
The concept of pre analytical, analytical and post analytical errors.  
Importance of labeling and identification.  
Barcoding of samples.
- e. Instruments (Theory and demonstration)**

Water Distillation plant and water deionisers. Use, care and maintenance  
Evaluation of water purity  
Refrigerators, cold box, deep freezers – Use, care and maintenance  
Laboratory balances : Use care and maintenance  
Guideline to be followed and precautions to be taken while Weighing.  
Weighing different types of chemicals, liquids. Hygroscopic compounds etc.



- f. Viscosity, surface tension, properties of colloids, emulsions, adsorption, partition coefficient and its application to biological systems.**  
Osmosis, dialysis and Donnan membrane equilibrium
- g. Concepts of Molecular weight, Atomic weight, Normality, Molarity, Standards, Atomic structure, Valency.**
- h. Introduction to the Chemistry of cell**  
Cell structure, Subcellular organelles and bio membrane –structure and function, cell fractionation
- i. Chemistry of Carbohydrates**  
Definition, Classification and biological importance.  
Monosaccharides, Oligosaccharides, Disaccharides & Polysaccharides
- j. Chemistry of Lipids.**  
Definition, Classification and biological importance.  
Simple lipids: Triacylglycerols and waxes-composition and functions.  
Compound lipids: Phospholipids, Sphingolipids & Glycolipids : composition and functions.  
Derived lipids: Fatty acids — saturated & unsaturated. Steroids and their properties
- k. Chemistry of Proteins — Classification and examples.**  
Amino acids: Classification, properties, side chains of amino acids, charge properties.  
Protein: Definitions, Classifications and functions.  
Peptides: Biologically active peptides — Examples such as GSH, Insulin— its structure.  
Structural organization, conformation and denaturation.
- l. Chemistry of Nucleic acids— DNA Structure and function, RNA Types: Structure and function**
- m. Acids and Bases:**  
Definition, classification & properties with examples.  
Concepts of acid base reaction, hydrogen ion concentration  
Ionisation of water, buffer, pH value of a solution  
Acid- base indicators:  
Definition, concept, colour change of an indicator in acidic and basic conditions  
Use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range.  
Regulation of Acid Base status:  
Buffers of the fluid & pH Regulation  
Disturbance in acid Base Balance, Anion Gap, Metabolic acidosis, Metabolic alkalosis, Metabolic alkalosis, Respiratory acidosis, Respiratory alkalosis  
Basic Principles and estimation of Blood Gases and pH  
Basic principles and estimation of Electrolytes and Water Balance  
Sodium regulation.
- n. Nutrition**  
Nutritional support with special emphasis on parenteral nutrition.  
Calorific Value, Nitrogen Balance, Respiratory Quotient, Basal metabolic rate, Dietary Fibers  
Nutritional importance of lipids, carbohydrates and proteins  
Vitamins – definition, classification, source, functions, deficiency & disorders

- o. Enzymes:**  
Definition and nature of enzymes, classification, coenzymes.  
Diagnostic enzymology
- p. BioSafety Measures in laboratory**
- q. Biomedical waste management**
- r. Conventional and SI units**

### **Practicals- Ist Year**

- i. Simple color reaction of carbohydrates and proteins,  
Identification of substances of Biochemical importance.
- ii. Preparation of solutions, calculation of Molecular Weights and Equivalent Weights,  
Preparation of Normal solutions, Molar solutions, percent solution and reagents,  
Dilution techniques
- iii. Titration of simple acid-base and calculation of Normality
- iv. Demonstration of colorimeter, spectrophotometer, pH meter

### **RECOMMENDED TEXT BOOKS**

1. Text book of Biochemistry- D M Vasudevan
2. Text book of clinical chemistry - Nobert. W. Teitz
3. Practical clinical biochemistry - Harold . Varley-vol.1 & Vol. II
4. Clinical Biochemistry-Principles & Practice- Praful. B. Godkar
5. Textbook of Biochemistry by Chatterjea and shinde

### **REFERENCE BOOKS**

1. Biochemistry a care oriented approach- Montgomery
2. Biochemistry in clinical practice - William's and Marks
3. Clinical chemistry - Kaplan
4. Methods in Biostatistics - B.K. Mahajan
- 5 Clinical chemistry – Michael L.Bishop
6. Clinical biochemistry metabolic and clinical aspects – William. J.marshall & stephen k.Bangert
5. Applied biochemistry of clinical disorders by Allan gornall

# **PATHOLOGY**

## **Theory**

### **I. GENERAL PATHOLOGY**

Introduction - scope of pathology

#### **1. Cell Injury and Cellular Adaptations.**

- a) Normal Cell
- b) Cell Injury- types, etiology, morphology.
- c) Cell death - autolysis, necrosis, apoptosis.  
Cellular adaptations - atrophy, hypertrophy, hyperplasia, metaplasia

#### **2. Inflammation**

- a) Introduction
- b) Acute inflammation - vascular events, cellular events, chemical mediators.  
Chronic Inflammation - general features, granulomatous inflammation, tuberculosis

#### **3. Healing and Repair**

- a) Definition, different phases of healing, factors influencing wound healing, fracture healing.

#### **4. Haemodynamic Disorders**

Edema, Hyperemia, Congestion, Hemorrhage, Embolism, Thrombosis, Infarction.

#### **5. Neoplasia**

- a) Definition, Nomenclature
- b) Features of benign and malignant tumours
- c) Spread of tumours
- d) Dysplasia, Carcinoma in situ, Precancerous lesions.

#### **6. Environmental and nutritional pathology**

- a) Smoking, Radiation injury  
Malnutrition, Obesity, Vitamin deficiencies

### **II. HEMATOLOGICAL DISORDERS**

#### **1. Introduction and Hematopoiesis**

#### **2. Anemia-** Introduction & Classification (Morphological & etiological)-

- a) Iron Deficiency Anemia : Distribution of body Iron, Iron Absorption, causes of iron deficiency, lab findings.
- b) Megaloblastic Anemia : Causes, Lab findings.  
Hemolytic Anemia : Definition, causes, classification & lab findings.

#### **3. WBC Disorders**

- a) Quantitative disorders.
- b) Leukemia- Introduction & classification, Acute leukemias, Chronic leukemias.

#### **4. Bleeding disorders**

- a) Introduction, physiology of hemostasis
- b) Classification, Causes of Inherited and Acquired bleeding disorders, Thrombocytopenia, DIC. laboratory findings -

#### **5. Pancytopenia**

### **III. BASIC HEMATOLOGICAL TECHNIQUES**

- 1) Characteristics of good technician
- 2) Blood collection – methods (capillary blood, venipuncture, arterial puncture) complications, patient after care).
- 3) Anticoagulants.
- 4) Transport of the specimen.
- 5) Preservation.
- 6) Effects of storage.
- 7) Separation of serum and plasma
- 8) Universal precautions
- 9) Complete hemogram- CBC, Peripheral smear, BT, CT, PT, APTT, ESR.
- 10) Disposal of the waste in the laboratory.

### **IV. TRANSFUSION MEDICINE**

- 1) Selection of blood donor
- 2) Blood grouping, Rh typing
- 3) Cross matching
- 4) Storage
- 5) Transfusion transmitted diseases
- 6) Transfusion reactions
- 7) Components – types, indications

### **V. CLINICAL PATHOLOGY–**

Introduction to Clinical Pathology- Collection, Transport, Preservation, and Processing of various clinical specimens -1 hour

#### **1. Urinalysis (4 hours)**

- a) Collection, preservatives, physical, chemical examination and microscopy.
- b) Physical examination: volume, color, odor, appearance, specific gravity and PH.
- c) Chemical examination: (strip method)
  - i. Protein: - Heat and acetic acid test, Sulfosalicylic acid method
  - ii. Reducing Sugar – Benedict test
  - iii. Ketone bodies - Rothera test
  - iv. Bile pigment - Fouchet method
  - v. Bile salt - Hays test
  - vi. Blood - Benzidine test
  - vii. Urobilinogen & Porphobilinogen - Ehrlich aldehyde and schwartz test
  - viii. Bence Jones Protein
- d) Microscopy

#### **2. Examination of cerebrospinal fluid (CSF)- 1 hour**

- a) Physical examination
- b) Chemical examination
- c) Microscopic examination

#### **3. Examination of body fluids (pleural, pericardial and peritoneal)-**

- a) Physical examination
- b) Chemical examination
- c) Microscopic examination

#### **4. Sputum Examination-**

### **PRACTICALS:**

#### **Laboratory Organization (2 hours)**

1. Reception of specimen, dispatch of reports, 'Records keeping', coding of cases.
2. Laboratory safety guidelines
3. SI units and conventional units in hospital laboratory

**Hematology techniques (18 hours)**

- 1) Basic requirements for hematology laboratory.
- 2) Glasswares for Hematology.
- 3) Equipments for Hematology.
- 4) Anticoagulant vials.
- 5) Complete Blood Counts.
- 6) Determination of Hemoglobin.
- 7) RBC Count & TLC by Hemocytometer.
- 8) Differential Leukocyte count.
- 9) Determination of Platelet Count.
- 10) Determination of ESR and PCV.
- 11) Erythrocyte Indices- MCV, MCH, MCHC.
- 12) Reticulocyte Count.
- 13) Absolute Eosinophil Count.
- 14) Morphology of Blood Cells.
- 15) Urinalysis.
- 16) Examination of cerebrospinal fluid (CSF).
- 17) Examination of body fluids (pleural, pericardial and peritoneal).
- 18) Sputum Examination.

**Reference Books (latest edition)**

Sl.No	Name of Book & title	Author	Publisher Name, place of publication
1	Basic Pathology	Robbins	Saunders, an imprint of Elsevier Inc., Philadelphia, USA
2	Text book of Pathology	Harsha Mohan	Jaypee Brothers, New Delhi
3	Practical Pathology	P. Chakraborty, Gargi Chakraborty	New Central Book Agency, Kolkata
4	Text Book of Haematology	Dr. Tejinder Singh	Arya Publications, Sirmour (H.P)
5	Text Book of Medical Laboratory Technology	Praful Godkar	Bhalani Publication House, Mumbai
6	Text Book of Medical Laboratory Technology	Ramanik Sood	
7	Practical Haematology	Sir John Dacie	Churchill Livingstone, London.
8	Todd & Sanford, Clinical Diagnosis & Management by Laboratory Methods	John Bernard Henry	All India travellar Booksellar,
9	Histopathology techniques.	Culling	
10	Histopathology techniques	Bancroft	
11	Diagnostic cytopathology	Koss	
12	Diagnostic cytopathology	Winifred grey	
13	Hand-Book of Medical Laboratory Technology	CMC Vellore.	
14	Basic Haematological Techniques	Manipal.	

## MICROBIOLOGY

### Theory

#### 1. Morphology

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

#### 2. Growth and nutrition

Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

#### 3. Culture media

Use of culture media in diagnostic bacteriology, anti microbial sensitivity test

#### 4. Sterilisation and Disinfection

Principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, antiseptic and disinfectants

#### 5. Immunology

Immunity, vaccines, types of vaccine and immunization schedule, principles and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HBsAg (excluding technical details)

#### 6. Bacteriology- Classification of bacteria and common bacterial infections

#### 7. Parasitology- classification and common infections

#### 8. Mycology

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi.

#### 9. Virology

General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis

#### 10. Hospital infection

Causative agents, transmission methods, investigation, prevention and control of hospital infection.

#### 11. Principles and practice Biomedical waste management

### Practicals:

Compound microscope.

Demonstration of sterilization equipments: hot air oven, autoclave, bacterial filters.

Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Mac conkey medium, L J media, Robertson cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph.

Antibiotic susceptibility test.

Demonstration of common serological tests: Widal, VDRL, ELISA.

Grams staining.

Acid fast staining.

Stool exam for helminthic ova & cysts.  
Visit to hospital for demonstration of biomedical waste management.  
Anaerobic culture methods.

## **REFERENCE BOOKS**

1. Anathanarayana & Panikar: Medical Microbiology – Revised 8th Edition University Press.
2. Robert Cruickshank: Medical Microbiology – The Practice of Medical Microbiology.
3. Chatterjee: Parasitology – Interpretation to Clinical medicine.
4. Rippon: Medical Mycology.
5. Emmons: Medical Mycology.
6. Basic Laboratory methods in Parasitology: 1st Ed, J P Bros, New Delhi.
7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers, New Delhi.
8. Ajit Damle: Medical Parasitology.
9. Anathanarayana: Introduction to Medical Microbiology, Orient Longman PVT Ltd.

## **SUBSIDIARY SUBJECTS**

### **ENGLISH**

**Teaching Hours: 20**

#### **1. Course Description**

This course is designed to help the student acquire a good command and comprehension of the English language through individual papers and conferences.

#### **2. Behavioural objectives**

The student at the end of training shall be able to:

- a) Read and comprehend English language.
- b) Speak and write grammatically correct English.
- c) Appreciate the value of English literature in personal and professional life.

#### **3. Contents**

##### **Unit - I: Introduction:**

- a) Study techniques.
- b) Organisation of effective note taking and logical processes of analysis and synthesis.
- c) Use of the dictionary.
- d) Enlargement of vocabulary.
- e) Effective diction.

##### **Unit - II: Applied grammar:**

- a) Correct usage.
- b) The structure of sentences.
- c) The structure of paragraphs.
- d) Enlargements of vocabulary.

**Unit - III: Written composition:**

- a) Precis writing and summarizing.
- b) Writing of bibliography.
- c) Enlargement of vocabulary.

**Unit - IV: Reading and comprehension:**

- a) Review of selected materials and express oneself in one's words.
- b) Enlargement of vocabulary.

**Unit - V: The Study of the various forms of composition:**

- a) Paragraph.
- b) Essay.
- c) Letter.
- d) Summary.
- e) Practice in writing.

**Unit - VI: Verbal communication:**

- a) Discussions and summarization.
- b) Debates.
- c) Oral reports.
- d) Use in teaching.

**REFERENCE**

1. English Grammar: Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993.
2. Wren and Martin: Grammar and Composition, 1989, Chand & Co, Delhi.
3. Letters for all Occasions: A S Myers. Pub - Harper Perennial.
4. Spoken English: V. Shasikumar and P V Dhanija. Pub. By: Tata Mcgraw Hill, New Delhi
5. Journalism Made Simple: D Wainwright.
6. Writers Basic Book self Series: Writers Digest series.
7. Interviewing by Joan Clayton Platkon.
8. Penguin Book of Interviews.

**HEALTH CARE****Teaching Hours: 40****1. Introduction to Health**

- a) Definition of health, determinants of health, health indicators of India, health team concept.
- b) National health policy
- c) National health programmes (Briefly objectives and scope)
- d) Population of India and family welfare programme in India

**2. Introduction to Nursing**

- a) What is nursing? Nursing principles, inter-personnel relationships.



- b) Bandaging: basic turns, bandaging extremities, triangular bandages and their application.
- c) Nursing position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- d) Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.
- e) Bed side management: giving and taking bed pan, urinal.
- f) Observation of stools, urine, sputum
- g) Use and care of catheters, enema giving.
- h) Methods of giving nourishment: feeding, tube feeding, drips, transfusion.
- i) Care of rubber goods.
- j) Recording of body temperature, respiration and pulse.
- k) Simple aseptic techniques, sterilization and disinfection.
- l) Surgical dressing: observation of dressing procedures.

### **3. First Aid :**

#### **REFERENCE BOOKS:**

1. Preventive and Social Medicine by J.Park

**MAIN SUBJECTS**  
**Second Year B.Sc, EMERGENCY AND TRAUMA CARE**  
**TECHNOLOGY**

**Paper I**  
**Introduction to Emergency Medicine**

1. Structure and organization of a hospital and its departments
2. Functioning of an ideal emergency medicine department
3. Ambulance services
4. Pre hospital care
5. Concept of triage
6. Principles of resuscitation
7. The emergency response team
8. Documentation
9. Multiple and mass casualties
10. Medico legal aspects

**Paper II**  
**Emergency Department Equipment**

Basic principle, description, types, usage, calibration and maintenance of:

1. Pulse oximeter
2. Electrocardiograph
3. Multiparameter monitors
4. Capillary blood glucose
5. Defibrillator, AED
6. Ventilator
7. Non-invasive ventilator
8. Crash cart
9. Airway adjuncts, supra-glottic airway devices
10. Splints and immobilization devices
11. Dressing and procedure packs and materials
12. Trolleys and stretchers
13. Medical gas, cylinders and pipelines
14. Anaesthesia work-station
15. Point of care investigations, ultrasound, X ray, blood and urine investigations

**Paper III**  
**Emergency Department Pharmacology**

1. Indications for use, dosage, route and method of administration and adverse effects of drugs commonly used in the Emergency Department
2. Routes of administration of medications
3. Preparation of injections and infusions
4. Review of prescription writing and interpretation
5. Medication errors
6. Strategies to reduce error

## **SYLLABUS FOR PRACTICALS II YEAR**

### **Paper I: Introduction to Emergency Medical Services**

Preparation of an ambulance
-----------------------------

Problems based on triage
--------------------------

Basic life support skills
---------------------------

### **Paper II: Emergency Department Equipment**

Application/ connection to patient, usage, calibration, changing settings, demonstrating maintenance of equipment (10 marks x 8 equipment)
--

### **Paper III: Emergency Department Pharmacology**

Problems based on drug dosage calculation
---

Demonstration of strategies to reduce medication error (Role-play)
--

Preparation of IV injection/ infusion
---------------------------------------

#### Text Books & Reference Books

1. Handbook of Emergency Care – Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchill
5. Fundamentals of Respiratory Care- Egan's – Craig I. Scanlon

## **SUBSIDIARY SUBJECTS**

### **SOCIOLOGY**

**Teaching Hours: 20**

#### **1. Course description**

This course will introduce student to the basic concepts of sociology, principles, social processes and social institutions in relation to the individual, family and community. The various social factors affecting the family in rural and urban communities in India will be studied.

#### **2. Introduction**

- a) Meaning, definition and scope of sociology.
- b) Its relation to anthropology, psychology, social psychology.
- c) Methods of sociological investigations: case study, social survey, questionnaire, interview and opinion poll methods.
- d) Importance of its study with special reference to health care professionals.

#### **3. Social factors in health and disease**

- a) Meaning of social factors.
- b) Role of social factors in health and disease.

#### **4. Socialization**

- a) Meaning and nature of socialization.
- b) Primary, secondary and anticipatory socialization.
- c) Agencies of socialization.

#### **5. Social groups**

- a) Concepts of social groups, influence of formal and informal groups on health and sickness.
- b) The role of primary groups and secondary groups in the hospital and rehabilitation setup.

#### **6. Family**

- a) The family, meaning and definitions.
- b) Functions of types of family.
- c) Changing family patterns.
- d) Influence of family on individual's health, family and nutrition.
- e) The effects of sickness in the family
- f) Psychosomatic diseases and their importance.....

#### **7. Community**

- a) Rural community: meaning and features.
- b) Health hazards of rural communities.
- c) Health hazards of tribal communities.
- d) Urban community: meaning and features.
- e) Health hazards of urban communities.

#### **8. Culture and health**

- a) Concept of culture.
- b) Concept of health.
- c) Culture and health.
- d) Culture and health disorders.

## **9. Social change**

- a) Meaning of social changes.
- b) Factors of social changes.
- c) Human adaptation and social change.
- d) Social change and stress.
- e) Social change and deviance.
- f) Social change and health programme.
- g) The role of social planning in the improvement of health and rehabilitation.

## **10. Social problems of disabled**

(Consequences of the following social problems in relation to sickness and disability and remedies to prevent these problems):

- a) Population explosion.
- b) Poverty and unemployment.
- c) Beggary.
- d) Juvenile delinquency.
- e) Prostitution.
- f) Alcoholism.
- g) Problems of women in employment.

## **11. Social security**

- a) Social Security and social legislation in relation to the disabled.

## **12. Social work**

- a) Meaning of social work.
- b) The role of a medical social worker.

## **Reference books**

1. Sachdeva & Vidyabhushan, Introduction to the study of sociology.
2. Indrani T.K., Text book of sociology for graduate nurses and Physiotherapy students, JP Brothers, New Delhi 10.

## **CONSTITUTION OF INDIA**

1. **Unit-I:** Meaning of the term 'Constitution'. Making of the Indian Constitution 1946-1950.
2. **Unit-II:** The democratic institutions created by the constitution, Bicameral system of Legislature at the Centre and in the States.
3. **Unit-III:** Fundamental rights and duties their content and significance.
4. **Unit – IV:** Directive principles of States, policies the need to balance fundamental rights with directive principles.
5. **Unit – V:** Special rights created in the Constitution for dalits, backwards, women and children and the religious and linguistic minorities.
6. **Unit-VI:** Doctrine of Separation of Powers, legislative, executive and judicial and their functioning in India.

7. **Unit – VII:** The Election Commission and State Public Service commissions.
8. **Unit – VIII:** Method of amending the Constitution.
9. **Unit – IX:** Enforcing rights through writs.
10. **Unit – X:** Constitution and sustainable development in India.

**Books:**

1. J.C. Johari: The Constitution of India: A Politico-Legal Study. Sterling Publication, Pvt. Ltd. New Delhi.
2. J.N . Pandey: Constitution Law of India, Allahbad, Central Law Agency, 1998.
3. Granville Austin: The Indian Constitution . Corner Stone of a Nation-Oxford, New Delhi, 2000.

## **ENVIRONMENTAL SCIENCE AND HEALTH**

### **Introduction to environment and health**

1. Sources, health hazards and control of environmental pollution.
2. The concept of safe and wholesome water, the requirements of sanitary sources of water, understanding the methods of purification of water on small scale and large scale, various biological standards, including WHO guidelines for third world countries, concept and methods for assessing quality of water.
3. Domestic refuse, sullage, human excreta and sewage, their effects on environment and health, methods and issues related to their disposal.
4. Awareness of standards of housing and the effect of poor housing on health.
5. Role of arthropods in the causation of diseases, mode of transmission of arthropods borne diseases, methods of control.

**Recommended Books.**

1. Text Book of Environmental Studies for undergraduate courses By Erach Bharucha Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt. Ltd.

**MAIN SUBJECTS**  
**Third Year B.Sc.- Emergency and Trauma Care**  
**Technology**

**Paper 1**

**Medical Emergencies**

1. Cardiovascular Emergencies
2. Pulmonary Emergencies
3. Fluid and Electrolyte Disturbances
4. Infectious Diseases and Sepsis
5. Neurological Emergencies
6. Endocrine and Metabolic Emergencies
7. Dermatological Emergencies
8. Gastrointestinal Emergencies
9. Haematology and Oncology Emergencies
10. Renal Emergencies
11. Immunological Emergencies

**Paper 2:**

**Trauma and Surgical Emergencies**

1. Trauma in Adults
2. Burns
3. Electrocution
4. Hanging
5. Drowning/near-drowning
6. Abdominal Emergencies
7. Skin and soft tissue infections
8. Emergencies of the Ear, Nose, and Throat
9. Oral and Neck Emergencies
10. Ophthalmic Emergencies

**Paper 3:**

**Emergencies in Pediatric and Special Population**

1. Emergencies in pediatric population
2. Obstetric emergencies
3. Gynecological emergencies
4. Emergencies in the elderly
5. Emergencies in Psychiatry and Behavior Disorders

**Text Books & Reference Books:**

1. Handbook of Emergency Care – Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's – Craig I. Scanlon

## SYLLABUS FOR PRACTICALS III YEAR

### Paper I: Medical Emergencies

Preparing an ambulance for medical emergency
Responding to a call and scene management of medical emergency
Receiving and resuscitating a patient with a medical emergency in the emergency department

### Paper II: Trauma and surgical emergencies

Preparing an ambulance for trauma
Responding to a call and scene management of trauma
Receiving and resuscitating a patient with trauma in the emergency department

### Paper III: Emergencies in paediatric and special population

Airway management and resuscitation of an infant
Airway management and resuscitation of a child
OSCE

## SUBSIDIARY SUBJECTS

### BIO STATISTICS AND RESEARCH METHODOLOGY

Teaching Hours: 20 Hours

#### 1. Course description

Introduction to basic statistical concepts.  
Methods of statistical analysis and interpretation of data.  
Introduction to research methodology

#### 2. Objectives

Understands statistical terms.  
Possesses knowledge and skills in the use of basic statistical and research methodology.

#### 3. Contents

##### a) Unit – I: Introduction

- i. Meaning, definitions, and types of statistics.
- ii. Statistics as a singular and plural noun
- iii. Branches of statistics.
- iv. Application of statistics in medicine.

##### b) Unit – II: Presentation of data

- i. Definition and types of data
- ii. Raw data, the array, frequency distribution.
- iii. Basic definitions and principles of tabular presentation
- iv. Basic principles of graphical representation.
- v. Types of diagrams: Bar, pie, line, histograms, pictogram.



- c) **Unit - III: Measure of central tendency**
- i. Need for measures of central tendency.
  - ii. Definition and calculation of mean: ungrouped and grouped.
  - iii. Meaning, interpretation and calculation of median ungrouped and grouped.
  - iv. Meaning and calculation of mode ungrouped and grouped.
  - v. Selection of an appropriate measure of central tendency.
- d) **Unit - IV: Measure of variability**
- i. Need for measure of variation.
  - ii. Range and mean deviation.
  - iii. Variance and standard deviation.
  - iv. Calculation of variance and standard deviation ungrouped and grouped.
  - v. Properties and uses of variance and SD.
- e) **Unit -V: Probability and standard distributions.**
- i. Meaning of probability and standard distributions.
  - ii. Priori and posteriori probabilities
  - iii. The Binominal and Poisson distributions.
  - iv. The normal distribution.
  - v. Divergence from normality: skewness, kurtosis.
- f) **Unit - VI: Sampling techniques**
- i. Population, sample and sampling.
  - ii. Methods and types of sampling.
  - iii. Random and non-random sampling
  - iv. Parameter and statistic.
  - v. Basic concepts and terms related to test of significance.
- g) **Unit - VII: Introduction to research methodology**
- i. Definition and characteristics of research.
  - ii. Levels and types of research.
  - iii. Experimental and non-experimental study designs.
  - iv. Definitions of case report, case series, case-control and cohort studies.

#### **RECOMMENDED BOOKS:**

- 1) KR Sundaram, SN Dwivedi and V Sreenivas (2010): Medical Statistics, Principles and Methods, BI Publications Pvt Ltd, New Delhi, India.
- 2) A Indrayan (2008): Basic Methods of Medical Research, Second edition, AITBS Publishers, India.
- 3) NSN Rao and NS Murthy (2008): Applied Statistics in Health Sciences, First Edition, JAYPEE brothers medical publishers (P) Ltd, India.
- 4) A. Mustafa (2010): Research Methodology, First edition, AITBS Publishers, India.

#### **BASICS IN COMPUTER APPLICATIONS**

##### **1. Introduction to data processing**

Features of computers, advantages of using computers, getting data into / out of computers, role of computers, data processing, application areas of computers involved in data processing, common activities in processing, types of data processing, characteristics of information, hardware and software.

### **5) Hardware Concepts**

Architecture of computers, classification of computers, concept of damage, types of storage devices, characteristics of discs, tapes, terminals, printers, network, applications of networking, concept of PC system care, floppy care, data care.

### **6) Concept of Software**

Classification of software, system software, application of software, operating system, computer system, computer virus, precautions against viruses, dealing with viruses, computers in medical electronics, basic anatomy of computers.

### **7) Principles of programming**

Computer application, principles in scientific research, work processing, medicine, libraries, museum, education, information system.

### **8) Data processing**

Computers in physical therapy: principles in EMG, exercise testing equipment, laser.

## **ETHICS**

### **1. Introduction**

2. Medical ethics is a systematic effort to work within the ethos of medicine, which has traditionally been service to sick.

### **3. Objectives**

Identify underlying ethical issues and problems in medical practice .

### **4. Course contents ( Syllabus)**

a. Introduction to medical ethics

What is ethics, what are values and norms, freedom and personal responsibility?

b. Definition of medical ethics

Major principles of medical ethics.

c. Perspective of medical ethics

The Hippocratic oath, The Declaration of Helsinki, The WHO Declaration of Geneva, International code of Medical Ethics (1993), Medical Council of India Code of Ethics (2002).

d. Ethics of the individual

Truth and confidentiality, the concept of disease, health and healing, the right to health.

e. The ethics of human life

Prenatal sex determination.

f. The family and society in medical ethics

Euthanasia, cancer and terminal care.

g. Death and dying

Use of life-support systems, the right to die with dignity, suicide – the ethical outlook.

h. Professional Ethics

Contract and confidentiality, malpractice and negligence.

### **5. Teaching/Learning Experience**

a. Increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.

b. Fostering the development of skills of analysis, decision making and judgment.

c. Making the students aware of the need to respect the rights of the patient.

d. Duties and responsibilities of the technologists.

