

SYLLABUS

for courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596



Bachelor of Science in Emergency Medical Technology (B.Sc EMT)

Course code: 033

2. COURSE CONTENT

2.1 Name of the course

Bachelor of Science in Emergency Medical Technology (B.Sc EMT)

2.2 Objectives of course

The main objectives of the program are to equip candidates with comprehensive skills and knowledge to:

- Demonstrate knowledge about the healthcare sector and emergency medical care services
- Demonstrate the ability to perform clinical skills essential in providing basic emergency medical care services such as urgent need to respond the emergency calls, assurance of scene safety, precision to call other emergency people, handling different emergency scenarios from clinical emergency to trauma emergency to mass casualty to disaster management, etc.
- Demonstrate setting of an ambulance for dealing with emergency situations
- Practice infection control measures
- Demonstrate safe and efficient transferring and ambulation techniques
- Demonstrate techniques to maintain the personal hygiene needs of oneself and the patient
- Demonstrate actions in the event of medical and facility emergencies
- Demonstrate professional behavior, personal qualities and characteristic of a Emergency Medical technician
- Demonstrate good communication, communicate accurately and appropriately in the role of Emergency Medical technician

Procedure scope and career options following the course completion

- Assisting Emergency Physicians in the Emergency Room/ICU
- As an Emergency Medical technician in transferring patients by road or water or air ambulance.
- As an instructor for various training Initiatives.
- Participation in community outreach programs on emergency care.
- Diverse job opportunities locally and internationally

2.3 Medium of instruction:

Medium of instruction and examinations shall be in English.

2.4 Course Outline

Emergency Medicine

The field of Emergency Medicine (EM) is a relatively recent addition to the landscape of Indian healthcare, whereas it serves as a cornerstone in the healthcare systems of most developed countries. EM involves the application of knowledge and skills essential for preventing, diagnosing, and managing the acute aspects of illnesses and injuries that impact patients across all age groups, encompassing a broad spectrum of both physical and behavioral disorders. Notably, EM is a specialized field where time sensitivity is paramount, and collaborative teamwork is fundamental. The resuscitative efforts within the department are seamlessly carried out by a cohesive team consisting of Emergency physicians, nurses, technicians, and other paramedical staff.

Emergency Medical Services

Historically, ambulances only transported patients to the point of care, and this remains the case in many parts of the developing world. The term "emergency medical service" was popularized when these services began to emphasize diagnosis and treatment at the scene. The term EMS evolved to reflect a change from a simple system of ambulances providing transportation, to a system in which actual medical care is given on scene and during transport. Training and qualification levels for members and employees of emergency medical services vary widely throughout the world. In India EMS is in its infancy and the members are qualified only to drive ambulances, with no medical training. In contrast, in some countries, they are known as emergency medical technicians (EMTs) and paramedics, who have Basic and advanced life support (ALS) skills.

2.5 Course Duration:

The duration of the course shall be four academic years including one year of clinical training/internship. The students have to attend a minimum of 240 working day in an academic year.

2.6 Subject

● First Year Subjects.

Sl No	Subject
A	Main subjects
1	Anatomy
2	Physiology
3	Biochemistry
4	Pathology
5	Microbiology
6	Clinics
B	Internal subjects
1	English & Communication skills
2	Foundation in Health care

● Second year Subjects

Sl No	Subject
A	Main Subjects
1	Introduction to Emergency Medical Services
2	Emergency Department Equipment
3	Pharmacology
4	Clinics
B	Internal subjects
1	Psychology
2	Constitution of India
3	Environmental Science & Health
4	Research and Biostatistics
5	Computer Applications

● Third Year Subjects.

Sl No	Subjects
A	Main Subjects
1	Medical Emergencies
2	Trauma and surgical emergencies
3	Emergencies in pediatric, OBG and special population
4	Clinics
B	Internal subjects
1	Medical Ethics and law

Fourth Year Subjects.

- a) One year compulsory rotational postings during which students have to work under supervision of an experienced staff in the following areas

Sl No	Postings
1	Emergency Medicine Department
2	Ambulance Services
3	ICUs
4	Gynaecology &
5	Paediatric casualty

- b) Every student must submit a project during the final year before attempting the final exams.

2.7 Total number of hours

Refer to Table I, Table II, and Table III for subject-wise distribution of teaching hours for theory and practical sessions in the first, second, and third years, respectively.

TABLE I: Distribution of Teaching Hours in First Year Subjects.

Sl No	Subject	Theory No. of hours	Practical No. of hours	Clinical hours	Total No. of hours
A	Main subjects				
1	Anatomy	120	100		220
2	Physiology	120	100		220
3	Biochemistry	75	30		105
4	Pathology	75	10		85
5	Microbiology	70	15		85
6	Clinics			120	120
B	Internal subjects				
1	English & Communication skills	60			60
2	Foundation in Health care	75	75		150
	Total	595	330	120	1045

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 Hours	Total
A	Main Subjects				
1	Introduction to Emergency Medical Services	110	50		160
2	Emergency Department Equipment	120	120		240
3	Pharmacology	100	30		130
4	Clinics			560	560

B	Internal subjects				
1	Psychology	20			20
2	Constitution of India	10			10
3	Environmental Science & Health	30			30
4	Research and Biostatistics	20			
5	Computer Applications	20	30		50
	Total	430	230	560	1220

TABLE III: Distribution of Teaching Hours in Third Year Subjects.

Sl No	Subject	Theory No. of Hours	Practical No. of Hours	Clinical Practical posting No. of Hours	Total
A	Main Subjects				
1	Medical emergencies	100	50		150
2	Trauma and surgical emergencies	100	50		150
3	Emergencies in pediatric, OBG and special population	100	50		150
4	Clinics			960	960
B	Internal subjects				
1	Medical Ethics and law	20			20
	Total	320	150	960	1430

TABLE IV: Distribution of Training Hours in Fourth Year Subjects.

- c) One year compulsory rotational postings during which students have to work under supervision of an experienced staff in the following areas

Sl No	Postings	Duration
1	Emergency Medicine Department	6 months
2	Ambulance Services	3 months
3	ICUs	1 month

4	Gynecology	1 month
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5	Paediatric casualty	1 month
Total		12 months

- d) Every student must submit a project during the final year before attempting the final exams.

2.8 Branches if any with definition

2.9 Teaching learning methods through Lecture and Practical classes

- Increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.
- Fostering the development of skills of analysis, decision making and judgment.
- Making the students aware of the need to respect the rights of the patient.
- Duties and responsibilities of the technologists.

2.10 Content of each subject in each year

FIRST YEAR B.Sc. EMERGENCY MEDICAL TECHNOLOGY

MAIN SUBJECTS –

1. ANATOMY –120 HOURS + 100 HOURS PRACTICAL

1. Introduction: Human Body as a Whole

Topic	Theory	Practical
Definition of Anatomy and its divisions	Terms of location, positions, and planes	Histology of types of epithelium
Cell and its organelles	Epithelium: classification, examples, function	Histology of serous, mucous & mixed salivary gland
Glands: classification, serous, mucous, mixed	Basic tissues: classification with examples	

2. Locomotion and Support

Topic	Theory	Practical
Cartilage: types with examples, histology	Histology of the 3 types of cartilage	Demo of all bones showing parts, radiographs of normal bones & joints
Bone: classification, names of bone cells, parts of long bone, microscopy of compact bone, vertebral column, inter-vertebral disc, fontanelles of fetal skull	Joints: classification with examples, synovial joint (in detail for radiology)	Histology of compact bone (TS & LS), Demonstration of all muscles of the body, Histology of skeletal, smooth & cardiac muscle (TS & LS)

3. Cardiovascular System

Topic	Theory	Practical
Heart: size, location, chambers, exterior & interior, blood supply of heart, systemic & pulmonary circulation, branches of aorta	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

Topic	Theory	Practical
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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	Demonstration of parts of gastro-intestinal system	
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5. Respiratory System

Topic	Theory	Practical
Parts of RS, nose, nasal cavity, larynx, trachea, lungs, broncho-pulmonary segments, histology of trachea, lung, names of paranasal air sinuses	Demonstration of parts of respiratory system	Normal radiographs of chest, Histology of lung and trachea

6. Urinary System

Topic	Theory	Practical
Kidney, ureter, urinary bladder, male and female urethra	Demonstration of parts of urinary system	Histology of kidney, ureter, urinary bladder, Radiographs of abdomen-IVP

7. Reproductive System

Topic	Theory	Practical
Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology), Mammary gland: gross	Demonstration of section of male and female pelvis with organs in situ	Histology of testis, ovary, Radiographs of pelvis, hystero-salpingogram

8. Endocrine Glands

Topic	Theory	Practical
Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (gross & histology)	Demonstration of the glands	



9. Nervous System

Topic	Theory	Practical
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	Demonstration of all parts of the brain	

10. Sensory Organs

Topic	Theory	Practical
Skin: histology, appendages of skin, Eye: parts of eye & lacrimal apparatus, Parts of ear: external, middle and inner ear and contents	Histology of thin and thick skin	Demonstration and histology of eyeball

11. Embryology

Topic	Theory	Practical
Spermatogenesis & oogenesis, Ovulation, fertilization, Placenta	Demonstration of models	

REFERENCE BOOKS

1. William Davis (P): *Understanding Human Anatomy and Physiology*, McGraw Hill
2. Chaurasia: *A Textbook of Anatomy*
3. T.S. Ranganathan: *A Textbook 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. Lippincott, Philadelphia.
6. Bhatnagar: *Essentials of Human Embryology*. Revised Edition Orient Blackswan Pvt. Ltd

2. PHYSIOLOGY - 120 HOURS + 100 HOURS PRACTICAL

I.Theory

1. General Physiology

- a) Organization of the cell and its functions
- b) Transport across cell membrane
- c) Membrane potential - resting membrane potential & action potential
- d) Body fluid compartments - normal value homeostasis
- e) Locomotion and support

2. Blood

Introduction: composition and function of blood.

- a) Red blood cells: erythropoiesis, stages of differentiation, function, count, physiological variation.
- b) Structure, function, concentration, physiological variation, methods of estimation of haemoglobin.
- c) White blood cells: production, function, count.
- d) Platelets: origin, normal count, morphology functions.
- e) Plasma proteins: types, functions
- f) Haemostasis: definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting
- g) Blood groups: ABO system, Rh system. Blood grouping & typing, cross matching.
- h) Rh system: Rh factor, Rh incompatibility.
- i) Blood transfusion: indication.transfusion reactions.
- j) Anticoagulants: classification, examples and uses.
- k) Anaemias: morphological and etiological classification, Blood indices: CI, MCH, MCV, MCHC.
- l) 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.

3. Muscle nerve physiology

- a) Classification of muscle, structure of skeletal muscle,
- b) Neuromuscular junction. Transmission across neuromuscular junction.
Excitation contraction coupling. muscle tone, fatigue, rigor mortis

4. Digestive System

- a) Physiological anatomy of gastro intestinal tract, functions of digestive system.
- b) Salivary glands: structure and functions, deglutition: stages and regulation.
- c) Stomach: structure and functions.
Gastric secretion: composition function regulation of gastric juice secretion.
- d) Pancreas: structure, function, composition of pancreatic juice
- e) Functions of liver. Bile secretion, composition, function. jaundice: types.
- f) Functions of gall bladder.
- g) Small intestine: functions, digestion, absorption, movements.
- h) Large intestine: functions, movements defecation digestion and absorption of carbohydrates, proteins, fats, lipids. role of gastrointestinal hormones on digestion

5. Excretory System

- a) 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^+ , Cl^- amino acids, sodium, potassium, etc.)
- b) Counter-current mechanisms: micturition, innervation of bladder, cystometrogram.
artificial kidney, renal function tests: plasma clearance, actions of ADH, aldosterone and PTH on kidneys.

6. Respiratory system

- a) Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract, respiratory muscles.
- b) 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 .

- c) Transport of respiratory gases: transport of oxygen & carbon dioxide, oxy haemoglobin dissociation curve factors affecting it.
- d) Lung volumes and capacities –normal values
- e) Regulation of respiration: mechanisms of regulation, nervous and chemical regulation, respiratory centre,
- f) Applied physiology : hypoxia, cyanosis, dyspnoea, apnoea.

7. Cardiovascular system

- a) Heart: physiological anatomy, nerve supply.
- b) Properties of cardiac muscle, cardiac cycle:
- c) Cardiac output (only definitions of stroke volume, cardiac index) normal heart sounds, areas of auscultation.
- d) Blood pressure: definition, normal value, clinical measurement of blood pressure, hypotension, hypertension.
- e) Physiological variations & regulation of heart rate,
- f) Pulse: jugular, radial pulse,
- g) Electrocardiogram (ECG) waves and normal duration

8. Endocrine System

- a) Classification of endocrine glands & Definition of hormone.
- b) Pituitary hormones: anterior and posterior pituitary hormones, secretion, functions
- c) Thyroid gland: physiological anatomy, hormone secreted, physiological function, regulation, secretion, disorders (hypo and hyper secretion of hormone).
- d) Adrenal cortex: physiological anatomy. cortical hormones, functions and regulation. Adrenal medulla: hormones, regulation and secretion. Functions of adrenaline and nor adrenaline.
- e) Hormones of pancreas.
 Insulin: secretion, regulation, function and action.
 Diabetes mellitus: regulation of blood glucose level.
- f) Parathyroid gland: function, action, regulation of secretion of parathyroid hormone.
- g) Calcitonin: functions and action.

9. Reproductive system

- a) Male reproductive system: functions of testes, spermatogenesis:
Endocrine functions of testes
- b) Female reproductive system: oestrogen, progesteron menstrual cycle:
ovulation, physiological changes during pregnancy, pregnancy tests.
Lactation: composition of milk, factors controlling lactation.

10. Nervous system

- a) Functions of nervous system, structure, classification and properties of neuron and neuroglia classification of nerve fibers
- b) Synapse: structure, types, properties.
- c) Receptors: definition, classification, properties.
- d) Reflex: definition reflex arc, clinical classification of reflexes: Babinski's sign. organization Spinal cord. Ascending tracts, descending tracts.
- e) Pyramidal tracts - functions Extrapyramidal tracts - functions
hypothalamus- functions Cerebral cortex lobes -functions, cerebellum-
functions
- f) Basal ganglion: functions.
- g) EEG.
- h) Cerebro Spinal Fluid (CSF): formation, circulation & reabsorption.
composition and functions. Lumbar puncture.
- i) Autonomic Nervous System:
Sympathetic and parasympathetic distribution

11. Special senses

- a) Vision: structure of eye, function of different parts. Structure of retina.
visual pathway, errors of refraction
- b) Hearing: structure and functions of ear.
- c) Taste: taste buds and taste pathway.
- d) Olfaction: receptors, pathway.
- e) Skin
- f) Structure and functions, regulation of body temperature

II. Practical

1. Hemoglobinometry.
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.*

3. BIOCHEMISTRY- 75 HOURS +30 HOURS PRACTICAL

I.Theory:

1. **Introduction to Biochemistry**
2. **Blood chemistry**
 - a) Biochemical components. Normal reference ranges. Diseased states.
3. **Urine chemistry**
 - a) Biochemical components. Normal reference ranges. Diseased states
4. **Specimen collection:**
 - a) Collection of blood, CSF, urine & other fluids
 - b) Use of preservatives, Anticoagulants
 - c) Method of transport, packing and storing of specimens,
 - d) The concept of pre analytical, analytical and post analytical errors.
 - e) Importance of labeling and identification.
 - f) Barcoding of samples.

5. **Instruments (Theory and demonstration)**

- a) Water Distillation plant and water deionizers. Use, care and maintenance
- b) Evaluation of water purity
- c) Refrigerators, cold box, deep freezers – Use, care and maintenance
- d) Laboratory balances: Use care and maintenance
- e) Guideline to be followed and precautions to be taken while weighing.
- f) Weighing different types of chemicals, liquids. Hygroscopic compounds etc.

6. Viscosity, surface tension, properties of colloids, emulsions, adsorption, partition coefficient and its application to biological systems.

Osmosis, dialysis and Donnan membrane equilibrium

7. Concepts of Molecular weight, Atomic weight, Normality, Molarity, Standards, Atomic structure, Valency.

8. **Introduction to the Chemistry of cell**

Cell structure, Subcellular organelles and bio membrane –structure and function , cell fractionation

9. **Chemistry of Carbohydrates**

- a) Definition, Classification and biological importance.
- b) Monosaccharides, Oligosaccharides, Disaccharides & Polysaccharides

10. **Chemistry of Lipids.**

- a) Definition, Classification and biological importance.
- b) Simple lipids: Triacylglycerols and waxes-composition and functions.
- c) Compound lipids: Phospholipids, Sphingolipids & Glycolipids: composition and functions.
- d) Derived lipids: Fatty acids — saturated & unsaturated. Steroids and their properties

11. **Chemistry of Proteins**

- a) Classification and examples.
- b) Amino acids: Classification, properties, side chains of amino acids, charge properties.
- c) Protein: Definitions, Classifications and functions.
- d) Peptides: Biologically active peptides — Examples such as GSH, Insulin— its structure. Structural organization, conformation and denaturation.

12. Chemistry of Nucleic acids

- a) DNA Structure and function,
- b) RNA Types: Structure and function

13. Acids and Bases:

- a) Definition, classification & properties with examples.
- b) Concepts of acid base reaction, hydrogen ion concentration
- c) Ionization of water, buffer, pH value of a solution
- d) Acid- base indicators
- e) Definition, concept, color change of an indicator in acidic and basic conditions
- f) Use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range.
- g) Regulation of Acid Base status:
- h) Buffers of the fluid & pH Regulation
- i) Disturbance in acid Base Balance, Anion Gap, Metabolic acidosis, Metabolic alkalosis, Respiratory acidosis, Respiratory alkalosis
- j) Basic Principles and estimation of Blood Gases and Ph
- k) Basic principles and estimation of Electrolytes and Water Balance
- l) Sodium regulation.

14. Nutrition

- a) Nutritional support with special emphasis on parenteral nutrition
- b) Calorific Value, Nitrogen Balance, Respiratory Quotient, Basal metabolic rate, Dietary Fibers
- c) Nutritional importance of lipids, carbohydrates and proteins
- d) Vitamins – definition, classification, source, functions, deficiency & disorders

15. Enzymes:

- a) Definition and nature of enzymes, classification, coenzymes.
- b) Diagnostic enzymology

16. Biosafety Measures in laboratory

17. Biomedical waste management

18. Conventional and SI units

Practical- First Year

1. Simple color reaction of carbohydrates and proteins, Identification of substances of Biochemical importance.
2. Preparation of solutions, calculation of Molecular Weights and Equivalent Weights, Preparation of Normal solutions, Molar solutions, percent solution and reagents, Dilution techniques
3. Titration of simple acid-base and calculation of Normality
4. 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*
4. *Clinical Biochemistry-Principles & Practice- Praful. B. Godkar*
5. *Textbook of Biochemistry by Chatterjea and shinde*
6. *Biochemistry a care oriented approach- Montgomer*
7. *Biochemistry in clinical practice - William's and Marks*
8. *Clinical chemistry – Kaplan*
9. *Methods in Biostatistics - B.K. Mahajan*
10. *Clinical chemistry – Michael L.Bishop*
11. *Clinical biochemistry metabolic and clinical aspects – William. J.marshall & Stephen k.Bangert*
12. *Applied biochemistry of clinical disorders by Allan gornall*

4. PATHOLOGY - 75 HOURS + 10 HOURS PRACTICAL

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 d) Cellular Adaptations - Atrophy, Hypertrophy, Hyperplasia, Metaplasia

2. Inflammation a) Introduction b) Acute Inflammation - Vascular Events, Cellular Events, Chemical Mediators c) 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 Tumors c) Spread of Tumors d) Dysplasia, Carcinoma In Situ, Precancerous Lesions
6. Environmental and Nutritional Pathology a) Smoking, Radiation Injury b) 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 c) 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 a Good Technician
2. Blood Collection - Methods (Capillary Blood, Venipuncture, Arterial Puncture) Complications, Patient Aftercare
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 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

Practical:

1. Laboratory Organization

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

2. Hematology Techniques

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)

1. *Basic Pathology, Robbins Saunders, an imprint of Elsevier Inc.,*
2. *Textbook of Pathology, Harsha Mohan, Jaypee Brothers, New Delhi*
3. *Practical Pathology, P. Chakraborty, Gargi Chakraborty, New Central Book Agency, Kolkata*
4. *Textbook of Hematology, Dr. Tejinder Singh Arya Publications*
5. *Textbook of Medical Laboratory Technology Praful Godkar*
6. *Textbook of Medical Laboratory Technology Ramanik Sood, CMC Vellore*
7. *Practical Hematology, Sir John Dacie Churchill Livingstone.*
8. *Todd & Sanford, Clinical Diagnosis & Management by Laboratory Methods John Bernard Henry*
9. *Histopathology Techniques, Culling*
10. *Histopathology Techniques, Bancroft*
11. *Diagnostic Cytopathology, Koss*

12. *Diagnostic Cytopathology, Winifred Grey*
13. *Hand-Book of Medical Laboratory Technology*

5. MICROBIOLOGY -70 HOURS +15 HOURS PRACTICAL

Theory

1. Morphology

- a) Classification of microorganisms, size, shape, and structure of bacteria.
- b) Use of microscope in the study of bacteria.

2. Growth and Nutrition

- a) Nutrition, growth, and multiplications of bacteria.
- b) Use of culture media in diagnostic bacteriology.

3. Culture Media

- a) Use of culture media in diagnostic bacteriology.
- b) Antimicrobial sensitivity test.

4. Sterilization and Disinfection

- a) Principles and use of equipment for sterilization (hot air oven, autoclave, serum inspissator).
- b) Pasteurization, antiseptics, and disinfectants.

5. Immunology

- a) Immunity, vaccines, types of vaccines, and immunization schedule.
- b) Principles and interpretation of common serological tests (Widal, VDRL, ASLO, CRP, RF & ELISA).
- c) 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

- a) Morphology, diseases caused, and lab diagnosis of fungi (Candida, Cryptococcus, Dermatophytes, opportunistic fungi).

9. Virology

- a) General properties of viruses, diseases caused, lab diagnosis, and prevention of viruses (Herpes, Hepatitis, HIV, Rabies, and Poliomyelitis).

10. Hospital Infection

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

11. Principles and Practice of Biomedical Waste

Management Practical:

1. Compound microscope.
2. Demonstration of sterilization equipment (hot air oven, autoclave, bacterial filters).
3. Demonstration of commonly used culture media.
4. Antibiotic susceptibility test.
5. Demonstration of common serological tests.
6. Gram staining.
7. Acid-fast staining.
8. Stool exam for helminthic ova & cysts.
9. Visit to the hospital for the demonstration of biomedical waste management.
10. 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. *Ananthanarayana: Introduction to Medical Microbiology, Orient Longman PVT Ltd*

INTERNAL SUBJECTS

1. ENGLISH & COMMUNICATION SKILLS *Teaching Hours: 60*

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

At the end of the training, the student shall be able to:

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

3. Contents

I: Introduction

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

II: Applied Grammar

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

III: Written Composition

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

IV: Reading and Comprehension

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

V: The Study of the Various Forms of Composition

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

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*

2. Foundation in Health care Teaching Hours: 75 + 75 Hours practical

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 wheelchair, transferring from bed to stretcher.
- e) Bedside management: giving and taking bedpan, 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

Demonstrations.

REFERENCE BOOKS

1. *Preventive and Social Medicine by J. Park*

SECOND YEAR B.SC EMERGENCY MEDICAL TECHNOLOGY

MAIN SUBJECTS

Paper I: Introduction to Emergency Medicine -110 Hours +50 Hours Practical

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- 120 Hours + 120 Hours Practical

Basic principles, 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. Anesthesia work-station.
15. Point of care investigations, ultrasound, X-ray, blood, and urine investigations.

Paper III: Pharmacology - 70 Hours + 50 Hours Practical

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 errors.

- General Pharmacology
- Evaluation of drugs in man, drug prescribing and drug interactions
- Sedatives, hypnotics and pharmacotherapy of insomnia
- Drugs effective in convulsive disorders
- Opioid analgesics
- Analgesic – antipyretics and non-steroidal anti-inflammatory drugs
- Psychopharmacology
- Drug therapy of parkinsonism and other degenerative disorders of the brain
- Local anesthetics
- Adrenergic and adrenergic blocking drugs
- Histamine and anti histamic drugs
- Pharmacotherapy of cough
- Pharmacotherapy of bronchial asthma and rhinitis
- Digitalis and pharmacotherapy of cardiac failure
- Vasodilator drugs and pharmacotherapy of angina pectoris
- Pharmacotherapy of hypertension
- Drugs and blood coagulation
- Drugs effective in iron deficiency and other related anemias
- Diuretics
- Emetics, drug therapy of vomiting, vertigo and diarrhea
- Pharmacotherapy of constipation
- Pharmacotherapy of peptic ulcer
- Sulfonamides, Trimethoprim, cotrimoxazole, nitrofurans and quinolones
- Penicillins and antibiotics effective mainly against gram positive organisms
- Aminoglycosides and other antibiotics effective mainly against gram negative organisms
- Antibiotics effective against both gram positive and gram negative organisms
- General principles of chemotherapy of infections
- Chemotherapy of urinary tract infections
- Antiseptics, disinfectants and insecticides
- Thyroid and antithyroid drugs
- Insulin and antidiabetic drugs
- Adrenal cortical steroids
- Vitamins and antioxidants
- Drugs, pregnancy and the newborn – 1 hour

Syllabus for Practical

Paper I: Introduction to Emergency Medical Services – 50 hours

Sl No	Practical Task	Description
1	Preparation of an ambulance	
2	Problems based on triage	
3	Basic life support skills	

Paper II: Emergency Department Equipment – 120 hours

Syllabus for Practical

Sl No	Equipment	Practical Tasks
1	1. Pulse oximeter	Application/connection to the patient, usage, calibration, changing settings, demonstrating maintenance.
2	2. Electrocardiograph	
3	3. Multiparameter monitors	
	... and so on for each equipment	

Paper III: Pharmacology 30 hours Syllabus for Practical

Sl No	Practical Task	Description
1	Problems based on drug dosage calculation	
2	Demonstration of strategies to reduce medication error (Role-play)	
3	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 L. Scanlon

2. INTERNAL SUBJECTS

1. Psychology- Teaching Hours: 20 Hrs

- **Introduction to Psychology**
- **Stress Coping and Subjective Wellbeing**
 - Nature and sources of stress
 - Types of stress – Pressure, Conflicts, and Frustration Stress and Health
 - Coping with Stress
 - Coping Strategies – Functional and Dysfunctional tion and determinants
- **Counseling**
 - Principles
 - Effective counseling
 - Counseling terminally ill
 - Counseling the relatives
- **Communication**
 - Process of communication
 - Listening
 - Nonverbal Communication
 - Effective interpersonal communication
- **Basic Psychotherapies**
 - Anxiety management
 - Basics of Solution focused brief therapy
- **Mental Health and mental illness**

Overview of mental health - concepts, characteristics of mentally healthy person,
Warning signs of poor mental health Psychosocial impact and consequences of cancer
diagnosis and consequences.

References:

1. Balachandran M. (2001), Psychology for Nursing Students, 1st edn., Maanas Publishers: Thiruvananthapuram.
2. Charles G Morris (1988). Psychology: An Introduction, Prentice Hall: New Jersey.
3. Razeena Viswambaran (IMS) Text Book of Psychology for Health Professionals.

CONSTITUTION OF INDIA :10 Hours

1. Meaning of the term 'Constitution'. Making of the Indian Constitution 1946- 1950.
2. The democratic institutions created by the constitution, Bicameral system of Legislature at the Centre and in the States.
3. Fundamental rights and duties their content and significance.

4. Directive principles of States, policies the need to balance fundamental rights with directive principles.
5. Special rights created in the Constitution for dalits, backwards, women and children and the religious and linguistic minorities.
6. Doctrine of Separation of Powers, legislative, executive and judicial and their functioning in India.
7. The Election Commission and State Public Service commissions.
8. Method of amending the Constitution.
9. Enforcing rights through writs.
10. 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.

2.ENVIRONMENTAL SCIENCE AND HEALTH - 30 HOURS

Introduction to Environment and Health

1. Sources, Health Hazards, and Control of Environmental Pollution.
2. The Concept of Safe and Wholesome Water
 - a) Requirements of sanitary sources of water.
 - b) Understanding methods of water purification on a small scale and large scale.
 - c) Various biological standards, including WHO guidelines for third world countries.
 - d) Concept and methods for assessing the quality of water.
3. Domestic Refuse, Sullage, Human Excreta, and Sewage
 - a) Effects on the environment and health.
 - b) Methods and issues related to their disposal.
4. Awareness of Standards of Housing

- a) The effect of poor housing on health.

5. Role of Arthropods in the Causation of Diseases

- a) Mode of transmission of arthropod-borne diseases.
- b) Methods of control.

Recommended Books

1. *Textbook of Environmental Studies for Undergraduate Courses By Erach Bharucha Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt*

4.. RESEARCH AND BIOSTATISTICS

Teaching Hours: 20

1. Course Description

- a) Introduction to basic statistical concepts.
- b) Methods of statistical analysis and interpretation of data.
- c) Introduction to research methodology.

2. Objectives

- a) Understands statistical terms.
- b) Possesses knowledge and skills in the use of basic statistical and research methodology.

3. Contents

1. Introduction
 - a) Meaning, definitions, and types of statistics.
 - b) Statistics as a singular and plural noun.
 - c) Branches of statistics.
 - d) Application of statistics in medicine.
2. Presentation of Data
 - a) Definition and types of data.
 - b) Raw data, array, frequency distribution.
 - c) Basic definitions and principles of tabular presentation.
 - d) Basic principles of graphical representation.
 - e) Types of diagrams: Bar, pie, line, histograms, pictogram.
3. Measure of Central Tendency

- a) Need for measures of central tendency.
- b) Definition and calculation of mean: ungrouped and grouped.
- c) Meaning, interpretation, and calculation of median: ungrouped and grouped.
- d) Meaning and calculation of mode: ungrouped and grouped.
- e) Selection of an appropriate measure of central tendency.

4. Measure of Variability

- a) Need for measures of variation.
- b) Range and mean deviation.
- c) Variance and standard deviation.
- d) Calculation of variance and standard deviation: ungrouped and grouped.
- e) Properties and uses of variance and SD.

5. Probability and Standard Distributions

- a) Meaning of probability and standard distributions.
- b) Priori and posteriori probabilities.
- c) The Binominal and Poisson distributions.
- d) The normal distribution.
- e) Divergence from normality: skewness, kurtosis.

6. Sampling Techniques

- a) Population, sample, and sampling.
- b) Methods and types of sampling.
- c) Random and non-random sampling.
- d) Parameter and statistic.
- e) Basic concepts and terms related to the test of significance.

7. Introduction to Research Methodology

- a) Definition and characteristics of research.
- b) Levels and types of research.
- c) Experimental and non-experimental study designs.
- d) 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*

6. COMPUTER APPLICATIONS 20 HOURS

1. Introduction to data processing

- a) 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.

2) Hardware Concepts

- a) 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.

3) Concept of Software

- a) 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.

4) Principles of programming

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

5) Data processing

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

THIRD YEAR B.SC. - EMERGENCY MEDICAL TECHNOLOGY

MAIN SUBJECTS

Paper 1: Medical Emergencies - 100

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 - 100

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, OBG and special population - 100 Hours

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 Churchill*
5. *Fundamentals of Respiratory Care - Egan's – Craig L. Scanlon*

SYLLABUS FOR PRACTICALS III YEAR

Paper I: Medical Emergencies – 50 hours

No.	Practical Task
1	Preparing an ambulance for a medical emergency
2	Responding to a call and scene management of a medical emergency
3	Receiving and resuscitating a patient with a medical emergency in the emergency department

Paper II: Trauma and surgical emergencies – 50 hours

No.	Practical Task
1	Preparing an ambulance for trauma
2	Responding to a call and scene management of trauma
3	Receiving and resuscitating a patient with trauma in the emergency department

Paper III: Emergencies in pediatric, OBG and special population – 50 hours

No.	Practical Task
1	Airway management and resuscitation of an infant
2	Airway management and resuscitation of a child
3	OSCE (Objective Structured Clinical Examination)

INTERNAL SUBJECTS

1. Medical Ethics and law - 20 HOURS

1. Introduction

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

2. Objectives

- a) Identify underlying ethical issues and problems in medical practice.

3. 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.

2.11 No: of hours per subject

As described in 2.7

2.12 Dissertation:

One dissertation to be completed before attending the final examination (Fourth year).

2.13 Speciality training if any

As described in 2.7.

2.14 Project work to be done if any

As described in 2.7

2.15 Any other requirements [CME, Paper Publishing etc.]

Atleast three State / National / International CME during the entire course must be participated/ presented.

2.16 Prescribed/recommended textbooks for each subject

As per 2.8

2.17 Reference books

As per 2.8

2.18 Journals

As per 2.8

2.19 Logbook

a) Model of Log Book

LOG BOOK OF B.Sc. EMT

1. Name.....
2. Roll No.
3. Address
4. Details of Posting: To Be Signed By The Supervising Teacher
5. Participation Conferences – CME Programmes.
6. Details of Leave Availed.
7. Details of Participation in Academic Programmes.
8. Seminars /Symposia Presented
9. Journal Clubs
10. Special Duties (If Any)
11. Miscellaneous
12. Daily Activities Record (Blank Pages)

(Four Page for Each Month X 48 Month Pages)

Signature of Student:

Signature of Supervising Teacher:

Signature of Head of Division/Co-ordinator of the course:

3. EXAMINATIONS

3.1 Eligibility to appear for exams

No candidates shall be admitted to any year of B.Sc EMT examination unless he/she has a minimum of 80% attendance with the provision for one time condonation up to 5% on medical grounds (condonable limit 75%). Condonation for shortage of attendance shall be vested with a committee constituted by the Principal/Head of Institution, with the Principal/ Head of Institution as the Chairman and five members (senior teachers) in the committee, and remittance of required fee to the University.

A candidate who has not attained 80%attendance and the shortage is beyond the condonable limit he/she shall not be eligible to continue the course with the same batch of students. He/ She may obtain special sanction (Condonation of Break of Study) from the institution and the university to continue with the junior batch of students. Those who obtain 50% of aggregate in each paper towards internal assessment will be eligible for appearing in the university examinations.

Regular periodic assessment shall be conducted throughout the course. At least three sessional examinations in theory and preferably one practical examination should be conducted in each subject. The model examination should be of the same pattern of the University Examination. Average of the best of two examinations and the marks obtained in assignments / viva / practical also shall be taken to calculate the internal assessment.

3.2 Schedule of Regular/Supplementary exams

Every year there shall be an examination to examine the students. Each examination may be held twice a year. The first examination in a year shall be the annual examination and the second examination shall be supplementary examination. The examinations shall be of written and practical /viva voce) carrying maximum marks for each part of a subject

● First year Subjects

Sl No	Subject
A	Main subjects
1	Anatomy
2	Physiology
3	Biochemistry
4	Pathology
5	Microbiology
6	Clinics
B	Internal subjects
1	English & Communication skills
2	Foundation in Health care

● Second year Subjects

Sl No	Subject
A	Main Subjects
1	Introduction to Emergency Medical Services
2	Emergency Department Equipment
3	Pharmacology
B	Internal subjects
1	Psychology
2	Constitution of India
3	Environmental Science & Health
4	Research and Biostatistics
5	Computer Applications

● Third Year Subjects.

Sl No	Subject
A	Main Subjects
1	Medical emergencies
2	Trauma and surgical emergencies
3	Emergencies in pediatric, OBG and special population
4	Clinics
B	Internal subjects
1	Medical Ethics and Law

Fourth Year Subjects.

- a) One year compulsory rotational postings during which students have to work under supervision of an experienced staff in the following areas

Sl No	Postings
1	Emergency Medicine Department
2	Ambulance Services
3	ICUs
4	Paediatric and Gynecological Emergency

- b) Every student must submit a project during the final year before attempting the final exams

3.3 Scheme of examination showing maximum marks and minimum marks

FIRST YEAR EXAMINATION (Max- Maximum and Min- Minimum for a pass, NA- not applicable)

Paper and Subjects	Theory						Practical						Grand Total	
	University		Internal		Total		University		Internal		Total			
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Anatomy	70	35	20	10	90	45			10	5	-	-	100	50
Physiology	70	35	20	10	90	45			10	5			100	50
Biochemistry	70	35	20	10	90	45			10	5			100	50
Pathology	70	35	20	10	90	45			10	5			100	50
Microbiology	70	35	20	10	90	45			10	5			100	50
English& Communication skills			50	25	50	25							50	25
Foundation in Health care	-	-	50	25	50	25	-						50	25
Total Marks	350	175	200	100	550	275	-	-	50	25	50	25	600	300

SECOND YEAR EXAMINATION

(Max- Maximum and Min- Minimum for a pass, NA- not applicable)

Paper and Subjects	Theory						Practical						Grand Total	
	Universit y		Internal		Total		Universit y		Internal		Total			
	M a x	Mi n	Max	Min	Max	M i n	M a x	M i n	M a x	M i n	M a x	M i n	M a x	Min
Introduction to Emergency Medical Services	70	35	30	15	100	50							100	50
Emergency Department Equipment	70	35	30	15	100	50							100	50
Pharmacology	70	35	30	15	100	50							100	50
Clinics							200	100	50	25	250	125	250	125
Psychology			20	10	20	10							20	10
Constitution of India			20	10	20	10							20	10
Environmental Science & Health			20	10	20	10							20	10
Research and Biostatistics			20	10	20	10							20	10
Computer Applications			20	10	20	10							20	10
Total marks	210	105	190	95	400	200	200	100	50	25	250	125	650	325

THIRD YEAR EXAMINATION

(Max- Maximum and Min- Minimum for a pass, NA- not applicable)

Paper and Subjects	Theory						Practical						Grand Total	
	University		Internal		Total		Universit y		Internal		Total			
	Ma x	Min	Max	Min	Max	Min	M a x	Min	Ma x	Min	Ma x	Min	Ma x	Min
Medical emergencies	100	50	50	25	150	75	80	40	20	10	100	50	250	125
Trauma and surgical emergencies	100	50	50	25	150	75	80	40	20	10	100	50	250	125
Emergencies in pediatric, OBG and special population	100	50	50	25	150	75	80	40	20	10	100	50	250	125
Medical Ethics and Law			50	25	50	25							50	25
Total marks	300	150	200	100	500	250	240	120	60	30	300	150	800	400

FOURTH YEAR EXAMINATION

Max- Maximum, Min- Minimum for a pass

PAPER	SUBJECT	University	
		Max	Min
	Project Submission & Presentation	50	25
	Viva Voce / MCQ	100	
Total Marks for Fourth Year		150	75

Total Marks for the whole course: 2200

3.4 Internal assessment component

Decided by the internal faculties.

3.5 Details of practical/clinical practicum exams

Total Practical examination marks=80 +20

- Spotters: 40 marks
- OSPE: 40 marks
- Internal Assessment (Practical): 20 marks

3.6 Number of examiners needed (Internal & External) and their qualifications

As per MSR

3.7 Details of viva voce: division of marks

4. Internship

Eligibility for internship

All theory and practical exams of first, second and third year should be passed before starting internship. One year compulsory rotational postings during which students have to work under supervision of an experienced staff in the following areas.

Sl No	Postings	Duration
1	Emergency Medicine Department	6 months
2	Ambulance Services	3 months
3	ICUs	1 month
4	Gynecology &	1 month
5	Paediatric casualty	1 month
Total		12 months

At the end of internship Log Book shall be submitted.

First Year BSc Emergency Medical Technology

Date:

Time: 3 hours

Maximum Marks: 70

Paper I

Anatomy/Anatomy and Histology

Leave first page blank for marks distribution

Draw neat and labeled diagrams wherever necessary

I. Write Essay (Any Two):

A. Enumerate the components of the male reproductive system. Describe testis under the following headings.

- a) Location.
- b) Coverings.
- c) External and internal features.
- d) Blood supply.

(3+1+3+6+2=15 Marks)

B. Describe kidney under the following headings.

- a) Location.
- b) Coverings.
- c) Structures in the hilum.
- d) Relations of right and left kidneys.
- e) Coronal section.

(1+4+3+4+3=15 Marks)

C. Answer the following questions based on your knowledge of the anatomy of the heart:

- a) Location.
- b) External features.
- c) Briefly describe the interior of the right atrium.
- d) Blood supply.

(1+5+4+5=15 Marks)

II. Write Short Notes (Any Five):

- A. Tongue.
- B. Thoracoabdominal diaphragm.
- C. Supports of uterus.
- D. Describe the compound epithelium with the help of a diagram and mention examples for each.
- E. Mention the origin, insertion, nerve supply & actions of the deltoid muscle.
- F. Describe the pituitary gland.

(5 x 5=25 Marks)

III. Write Short Answers On (Any Five):

- A. Define any three anatomical planes.
- B. Enumerate the cranial nerves.
- C. Lobes of prostate.
- D. Cartilages of larynx.
- E. Parts of uterine tube.
- F. Parts of sternum.

(3x5=15 Marks)

First Year BSc Emergency Medical Technology

Date:

Time: 3 hours

Maximum Marks: 70

Paper - II

Physiology

Leave first page blank for marks distribution.

Draw neat and labeled diagrams wherever necessary

1. Write Essay (Any Two):

- A. Explain the actions of Insulin in human body. Describe the clinical features and complications of Diabetes Mellitus.
 - B. With the help of a neat labeled diagram explain the mechanism of gastric acid secretion. How is the secretion regulated? Write briefly on gastric mucosal barrier.
 - C. Define blood pressure, give its normal value and explain the short term regulation of blood pressure.
- (15 x 2 = 30 Marks)**

1. Write Short Notes (Any Five):

- A. Factors affecting erythropoiesis.
 - B. Neuromuscular junction.
 - C. Hypoxia.
 - D. Functions of middle ear.
 - E. Functions of Cerebrospinal fluid.
 - F. Glomerular filtration rate.
- (5 x 5 = 25 Marks)**

III. Write Short Answers (Any Five):

- A. Factors affecting spermatogenesis.
 - B. Functions of placenta.
 - C. Functions of WBC.
 - D. Surfactant.
 - E. Referred pain.
 - F. Errors of refraction in human eye.
- (3 x 5 = 15 Marks)**
-

First Year BSc Emergency Medical Technology

Date:

Time: 3 hours

Maximum Marks: 70

Paper III Biochemistry

Leave first page blank for marks distribution
Draw neat and labeled diagrams wherever necessary

I. Write Essay (Any Two):

- A. Name the plasma buffers. Describe the renal regulation of acid-base balance. Add a note on the anion gap. **(3+8+4 =15 Marks)**
- B. What is the normal level of serum calcium? What are the functions of serum calcium? Name the factors that regulate calcium absorption. Describe in detail the hormonal regulation of serum calcium. **(1+6+3+5=15 Marks)**
- C. Enumerate any five differences between fat and water-soluble vitamins. Write the dietary sources, biochemical functions and deficiency manifestations of vitamin C. **(5+2+4+4=15 Marks)**

II. Write Short Notes On (Any Five):

- A. Structure of DNA.
- B. Tumor markers.
- C. Colorimetry.
- D. Discuss the enzymes elevated in liver diseases.
- E. Write the steps of heme synthesis.
- F. Complications of Diabetes mellitus. **(5 x 5 = 25 Marks)**

III. Write Short Answers On (Any Five):

- A. Mitochondria.
 - B. Functions of plasma proteins.
 - C. Wald visual cycle.
 - D. Creatinine clearance.
 - E. PUFA.
 - F. TCA cycle. **(3 x 5 = 15 Marks)**
-

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Date:

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Maximum Marks: 70

Paper IV Microbiology

Leave first page blank for marks distribution
Draw neat and labeled diagrams wherever necessary

I. Write Essay (Any Two):

- A) Define sterilization. Classify moist heat sterilization. Describe the principle, structure and function of the autoclave with neat diagram.
(2+3+10= 15 Marks)
- B) Pathogenesis, clinical features, lab diagnosis of HIV. Draw labelled diagram of HIV.
(2+3+5+5=15 Marks)
- C) Describe the Lifecycle, Clinical features, lab diagnosis and preventive measures of malaria.
(5+3+4+3=15 Marks)

II. Write Short Notes On (Any Five):

- G. Pulmonary tuberculosis.
 - H. Describe Hospital acquired infections / nosocomial infections.
 - I. Innate immunity.
 - J. Typhoid fever.
 - K. Bacterial cell wall.
 - L. Candidiasis.
- (5 x 5 = 25 Marks)

III. Write Short Answers On (Any Five):

- G. Enumerate three sexually transmitted diseases and their etiological agents.
 - H. IgG.
 - I. Hydatid cyst.
 - J. Agents of food poisoning.
 - K. Name three subcutaneous mycoses and 3 systemic mycoses.
 - L. Name three RNA viruses and three DNA viruses.
- (3 x 5 = 15 Marks)
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