# MALLA REDDY VISHWAVIDYAPEETH

## SCHOOL OF ALLIED HEALTH CARE SCIENCES AND TECHNOLOGY

Suraram X Roads, Jeedimetla,
Hyderabad-500055
Web: https://mrvv.edu.in/

**Program**

**Bachelor of Science (B.Sc.)**

**Emergency Medicine & Critical Care Technology**

2025

**MALLA REDDY VISHWAVIDYAPEETH**

**SCHOOL OF ALLIED HEALTH CARE SCIENCES AND TECHNOLOGY**

**BACHELOR OF EMERGENCY MEDICINE & CRITICAL CARE TECHNOLOGY**

## Vision

To develop competent emergency and critical care technologists who contribute to saving lives through timely intervention, advanced clinical skills, and compassionate patient care.

## Mission

To provide strong foundational knowledge, practical training, and technical expertise in emergency medicine and critical care, while fostering ethical practice, teamwork, and continuous learning.

## Program Educational Objectives (PEOs)

Graduates will:

- Apply fundamental knowledge of emergency and critical care in clinical practice
- Assist in life-saving procedures and patient management
- Work effectively within multidisciplinary healthcare teams
- Demonstrate ethical and professional behavior
- Contribute to improving patient care and safety in emergency settings

## Program Outcomes (POs)

Students will:

- Understand basic concepts of emergency medicine and critical care
- Assess and monitor patients in emergency and ICU settings
- Assist in basic and advanced life support procedures
- Operate and maintain emergency and critical care equipment
- Analyze basic clinical and diagnostic data
- Communicate effectively with patients and healthcare professionals
- Follow ethical, legal, and safety standards
- Use appropriate tools and technologies in patient care
- Address basic community and emergency health needs
- Engage in lifelong learning and skill development

## Program Specific Outcomes (PSOs)

Students can:

- Perform patient assessment and assist in triage
- Assist in airway management and resuscitation procedures
- Handle emergency equipment such as monitors and defibrillators
- Support ICU patient care and monitoring
- Assist in infection control and patient safety practices
- Participate in basic clinical data collection and healthcare support services

## Course Outcomes (COs)

Students will:

- Understand basic emergency and critical care concepts
- Assess vital signs and patient condition
- Assist in planning and delivering basic patient care
- Interpret basic clinical and laboratory findings
- Apply infection control and safety measures
- Develop practical, technical, and communication skills

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**COURSE STRUCTURE**

## I year I semester

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Human Anatomy - I | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Human Physiology - I | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Medical Bio-chemistry | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Sociology | 2 | - | - | 2 | 30 | 70 | 100 |
| 5 | | English and Communication Skills | 2 | - | - | 2 | 30 | 70 | 100 |
| 6 | | Basics of Computers | 1 | - | 2 | 2 | 30 | 70 | 100 |
| 7 | | Human Anatomy - I Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 8 | | Human Physiology - I Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 9 | | Environmental Awareness | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **19** | **-** | **6** | **24** | **340** | **560** | **900** |

## I, Year II semester

| S.NO. | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Human Anatomy – II | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Human Physiology - II | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Medical Microbiology | 3 | | - | 3 | 30 | 70 | 100 |
| 4 | | Pathology | 3 | | - | 3 | 30 | 70 | 100 |
| 5 | | Pharmacology | 3 | | - | 3 | 30 | 70 | 100 |
| 6 | | Health Psychology | 2 | | - | 2 | 30 | 70 | 100 |
| 7 | | Human Anatomy – II Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 8 | | Human Physiology – II Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 9 | | Stress Management | 1 | | | 1 | 100 | - | 100 |
| | | **TOTAL** | **20** | | **4** | **24** | **340** | **560** | **900** |

## II year III semester

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Emergency Medical Services | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Critical Concepts and Management | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Instrumentation In Emergency Medical Service | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Medical Law, Ethics & Medical Records | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Emergency Critical Concepts and Management Practical | - | - | 5 | 5 | 30 | 70 | 100 |
| 6 | | Soft Skills Development | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **18** | **-** | **5** | **23** | **250** | **350** | **600** |

## II year IV semester

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARK | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Toxicological And Environmental Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Principles Of Trauma Care | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Disaster Management and Industrial Emergencies | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Principle Of Nursing | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Toxicological And Environmental Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 6 | | Principles of Trauma Care Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 7 | | Health and Well-being | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **18** | **-** | **6** | **24** | **280** | **420** | **700** |

## III year V semester

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARK | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Surgical Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Pediatrics | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Obstetrical Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Surgical Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 5 | | Emergency Pediatric Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 6 | | Obstetrical Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 7 | | Interpersonal Communication | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **14** | **-** | **9** | **23** | **280** | **420** | **700** |

## III year VI semester

| S. NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Critical Care Medicine | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Orthopedics | 4 | - | 2 | 6 | 30 | 70 | 100 |
| 3 | | Research Methodology & Biostatistics | 3 | - | - | 3 | 30 | 70 | 100 |
| 4 | | Hospital and Emergency Room Management | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Practical Skill Applications in Emergency Medical Services | 2 | - | 2 | 4 | 30 | 70 | 100 |
| 6 | | Critical Care Medicine Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 7 | | Art of Being a Better Person | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **19** | **-** | **6** | **25** | **280** | **420** | **700** |

## IV year VII semester

| Course Code | Course Title | Credits/Week | | | Hours/Semester | | | Assessments | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | P | C | L | T/P | Total | INT | EXT | |
| | Internship | 2 | 20 | 22 | 30 | 900 | 930 | - | 100 | 100 |
| | Project Work | - | 6 | 6 | - | 270 | 270 | - | 100 | 100 |
| **Total** | | **2** | **26** | **28** | **30** | **1170** | **1200** | **-** | **200** | **200** |

## IV year VIII semester

| Course Code | Course Title | Credits/Week | | | Hours/Semester | | | Assessments | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | P | C | L | T/P | Total | INT | EXT | |
| | Internship | 2 | 20 | 22 | 30 | 900 | 930 | - | 100 | 100 |
| | Project Work | - | 6 | 6 | - | 270 | 270 | - | 100 | 100 |
| **Total** | | **2** | **26** | **28** | **30** | **1170** | **1200** | **-** | **200** | **200** |

**1.1UnderGraduateProgramme**

| Sl. No. | Course | Duration | Eligibility for admission |
|---|---|---|---|
| 1 | BSC Emergency Medicine & Critical Care Technology | 4 Years | 10+2 or equivalent |

**Medium of Instruction:**

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

**Duration of the Course**

Duration details are mentioned under clause no.1.1 of this booklet.

**Examination Regulations**

**Attendance: 75% of attendance (physical presence) is mandatory.**

Medical leave or other types of sanctioned leaves will not be counted as physical presence. Attendance will be counted from the date of commencement of the session to the last day of the closing of attendance before the final examination.

**Internal Assessments:**

a) Regular periodic assessment shall be conducted throughout the course. In each semester, there will be **two one-hour internal assessments (10 marks each)** and a continuous assessment (10 marks). Thus, a total of 30 marks for the internal exam (i.e., Weightage for internal assessment shall be30% of the total marks in each subject).

b) **Exam pattern for internal assessment** in each semester will be

(a) Short questions 3nos.out of which the student should write two questions, each carrying 5marks (i.e. 2 x 510 marks). Two such internal examinations will be conducted.

(b) Continuous assessment of the student will be done. Students' overall attendance, performance in class, behaviour of the student, extra-curricular activities, etc. will be assessed. Continuous assessment carries 10 marks.

(d) Thus, a total of 30 marks for the internal examination. (10+10+10=30 marks). A candidate should secure a minimum of 40% marks in the internal assessment in each subject to be eligible to appear for the University examination

(e) For value-added courses, only an internal examination will be conducted. The assessment comprised five assignments/presentations/case presentations, each carrying 10 (i.e. 5 x10=50 marks). Final examination will be for 50 marks with 5 questions each carrying 10 marks (5x10=50marks). The minimum pass is 40% marks.

**University Examinations (External):**

a) University Examination shall be conducted at the end of every semester.

b) A candidate who satisfies the requirement of attendance and internal assessment marks, as stipulated by the University, shall be eligible to appear for the University Examination.

c) Examination will be of 3 hours duration (for theory). The question pattern for those subjects without practical examination (70 marks) will be (a)Three essay questions out of which the student should answer 2 questions, each carrying 10 marks (i.e. 2 x 10 = 20 marks), (b) Eight short note questions out of which the student should attempt six questions, each carrying 5 marks (6x5=30 Marks). (c)Ten very short questions each carrying 2marks (i.e., 10 x 2 = 20 marks).Thus, a total of 70 marks.

d) The question pattern for practical examination (a) Spotters/major practical/minor

practical/Viva/practical record.

The minimum pass for the internal assessment is 40% and for the University Examination is 50%. i.e. a student should score a total of 50% (adding the internal and external examinations) to pass in each subject.

## SEMESTER-I

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Human Anatomy - I | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Human Physiology - I | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Medical Bio-chemistry | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Sociology | 2 | - | - | 2 | 30 | 70 | 100 |
| 5 | | English and Communication Skills | 2 | - | - | 2 | 30 | 70 | 100 |
| 6 | | Basics of Computers | 1 | - | 2 | 2 | 30 | 70 | 100 |
| 7 | | Human Anatomy - I Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 8 | | Human Physiology - I Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 9 | | Environmental Awareness | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **19** | **-** | **6** | **24** | **340** | **560** | **900** |

## 1.HUMAN ANATOMY–I

**L/T/P/C**
**4/-/-/4**

### Learning Objectives:

- Understand the basic structure of the human body
- Study organization of cells, tissues, and organ systems
- Learn anatomy of musculoskeletal and cardiovascular systems
- Identify anatomical terminology and body planes

### Learning Outcomes:

Students will be able to:

- Describe structure and organization of the human body
- Identify major organs and systems
- Apply anatomical knowledge in clinical contexts
- Use correct anatomical terminology

**(60 hrs)**

**UNIT-I GENERAL ANATOMY AND HISTOLOGY (12 hrs)**

**General Anatomy:**

- Fascia
- Muscles
- Bones
- Joints
- Vessels
- Nerve

**General Histology**:

- Epithelial
- Connective tissue
- Muscle
- Bone and cartilage
- Nerves and vessels
- Embryology

**UNIT-II UPPER EXTREMITY:**
**(12hrs)**

- Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
- Muscles: Origin, insertion, nerve supply, and actions.

**UNIT-III UPPER EXTREMITY:**
**(12 hrs)**

- Joints: Shoulder girdle, shoulder joint, elbow joints, radioulnar joint, wrist joint, and joints of the hand.
- Breast, pectoral region, axilla, cubital fossa, arch of the hand
- Brachial plexus, nerves of the upper extremity
- Blood vessels and lymphatic drainage

**UNIT-IV CARDIO VASCULAR & RESPIRATORY ANATOMY (12 hrs)**

- Thoracic wall
- Mediastinum
- Heart: Anatomy of heart, blood supply, nerve supply, conducting system, conducting System and major blood vessels
- Lungs: Anatomy of lungs, bronchial tree, pleura, bronchopulmonary segments, blood Supply, and nerve supply
- Diaphragm: Origin, insertion, nerve supply, and action, openings in the diaphragm.
- Intercostal muscles and accessory muscles of respiration: Origin, insertion, nerve supply, and action
- Ribs and sternum

**UNIT-V**
**SYSTEMICANATOMY**
**(12hrs)**

1. Digestive system:
   **List the parts of the digestive system**
   **Anatomy of the stomach, liver, gallbladder, spleen, pancreas, and intestines.**
2. Urinary system:
   **Anatomy of the kidney, urinary bladder**
3. Endocrine system:
   **Position and hormones secreted by each organ**
4. Genital system:

**Male organs and female organs**

**RECOMMENDED TEXT BOOKS**

1. Human Anatomy-Snell
2. Anatomy- Chaurasia, Volume, and III
3. Neuroanatomy-Inderbir Singh
4. Human Anatomy- Kadasne, Volume, and III
5. Neuroanatomy— Vishrsam Singh
6. Human Anatomy- Datta

## 2.HUMAN PHYSIOLOGY–I

**L/T/P/C**
**4/-/-/4**

### Learning Objectives:

- Understand functions of major body systems
- Learn physiology of blood, cardiovascular, and respiratory systems
- Study homeostasis and body regulation mechanisms
- Correlate normal physiological processes with health

### Learning Outcomes:

Students will be able to:

- Explain normal physiological functions of body systems
- Interpret basic physiological parameters
- Apply physiology knowledge to clinical situations
- Identify deviations from normal function

**(60 hrs)**

## UNIT-I GENERAL PHYSIOLOGY (12hrs)

**Cell:**

1. **Structure of cell membrane**
    a) Fluid mosaic model
    b) Lipid bi-layer
    c) Functions of cell membrane
2. **Transport across cell membrane**
    A. Basic mechanism of transport
    a) Channel proteins
    b) Carrier proteins

    B. Methods of transport
    a) Passive transport
    b) Active transport
3. **Body fluids**
    a) Intracellular fluid
    b) Extracellular fluid
    c) Body electrolytes
    d) Regulation of body fluid volume
4. **Homeostasis**
    a) Regulation of body function
    b) Homeostatic regulatory mechanism

**BLOOD:**

1. **Composition of blood & it's volume**
2. **Plasma**
3. **Hemopoiesis**
    a) Composition
    b) Plasma protein
4. **Erythrocytes**
    a) Normal count
    b) Structure of RBC (shape & size)
    c) Functions of RBC
    d) Hemoglobin (Normal Value, Fate, Function)
    e) Anemia & polycythemia
    f) ESR & PCV
5. **Leukocytes**
    a) Classification
    b) Functions of leukocytes
6. **Platelets**
    a) Normal count
    b) Functions of thrombocytes
    c) Blood Coagulation
    d) Bleeding time & clotting time
7. **Blood group**
    a) ABO system
    b) Landsteiner's law
    c) ABO incompatibility
    d) Rh system
    e) Rh incompatibility & erythroblastosis fetalis
8. **Blood transfusion**
    a) Collection & storage of blood
    b) Precautions
    c) Cross matching
    d) Hazards of blood transfusion

**Nerve:**

1. **Structure of a neuron**

2. **Classification of neurons**
3. **Electrical activity of neuron**
    a) Resting membrane potential
    b) Action potential
4. **Propagation of nerve impulse**
5. **Properties of nerve fibers**
6. **Neuroglia - Types & functions**
7. **Nerve injury**
    a) Types of nerve injury
    b) Effect of nerve injury
    c) Regeneration of damaged nerve fiber

**UNIT – II** **(12hrs)**

**MUSCLE PHYSIOLOGY**

1. **Classification**
2. **Properties of skeletal muscle**
3. **Structure of skeletal muscle**
    a) Sarcomere
    b) Sarcotubular system
    c) Neuromuscular junction & disease affecting it
4. **Excitation-Contraction coupling**
5. **Mechanism of muscle contraction**
6. **Functions of skeletal muscle**
7. **Types of muscle contractions**
8. **Red & white muscles**
9. **Rigor mortis, muscular dystrophy, altered muscle tone, muscle cramp, atrophy, EMG**

**UNIT – III** **(12hrs)**

**CARDIOVASCULAR SYSTEM**

1. **Structure of heart & blood vessels**
2. **Properties of cardiac muscle**
3. **Origin & spread of cardiac impulse**

4. **Cardiac cycle & heart sounds**
5. **Cardiac output**
    a) Related terms
    b) Regulation of cardiac output
    c) Circulatory shock
6. **Pulse & Heart rate and it's regulation**
7. **Blood pressure**
    a) Definitions
    b) Factors controlling & influencing BP
    c) Regulation of BP
8. **Regional circulation**
    a) Coronary circulation
    b) Cerebral circulation
9. **Normal ECG.**

**UNIT – IV** **(12hrs)**

**RESPIRATORY SYSTEM**

1. **Introduction, structure & function of RS**
    a) Upper respiratory tract
    b) Lower respiratory tract
    c) Respiratory membrane
2. **Mechanism of breathing**
    a) Mechanics of breathing
    b) Respiratory pressure change
    c) Compliance
    d) Surfactant
3. **Respiratory volumes & capacities**
4. **Pulmonary ventilation & Dead space**
5. **Transport of respiratory gases**
6. **Nervous & chemical regulation of respiration**
7. **Pulmonary function test - direct & indirect method**

**8. Physiological changes with altitude & acclimatization**

**UNIT – V** **(12hrs)**

**EXERCISE PHYSIOLOGY**

1. Basal Metabolic Rate & Respiratory Quotient
2. Energy metabolism
3. Fatigue
4. Oxygen debt
5. Acute cardiovascular changes during exercise; difference between mild, moderate & severe exercise.
6. Concept of endurance
7. Acute respiratory changes during exercise
8. Concept of training/conditioning; effects of long-term exercise/training on the CVS & RS
9. Body temperature regulation during exercise
10. Hormonal & metabolic effects during exercise
11. Exercise for muscle strength, power, endurance and there effects on it. Physical fitness & its components

**RECOMMENDED TEXT BOOKS**

1. Textbook on Medical Physiology-Guyton
2. Textbook of Physiology-AK Jain (for MBBS students)
3. Human Physiology-C.C. Chatterjee
4. Essentials of Medical Physiology- Sembulingam, K.
5. ComprehensiveTextbookofMedicalPhysiology:Vol-1&2 -Pal, Gopal Krishna
6. Physiology: Prep Manual for Undergraduates-Joshi, Vijaya D.
7. Practical Physiology-Joshi, Vijaya D.

## 3. BIOCHEMISTRY–I

**L/T/P/C**
**4/-/-/4**

### Learning Objectives:

- Understand basic biochemical components of the body
- Learn metabolism of carbohydrates, proteins, and lipids
- Study enzymes, vitamins, and hormones
- Understand biochemical basis of diseases

### Learning Outcomes:

Students will be able to:

- Explain biochemical processes in the human body
- Interpret basic biochemical laboratory reports
- Relate biochemical changes to disease conditions
- Apply biochemical knowledge in clinical practice

**(60hrs)**

**UNIT-I** **(12hrs)**

**CARBOHYDRATE CHEMISTRY**

- Definition, general classification with examples
- Composition and function of Monosaccharides and Polysaccharides
- Anomers, Epimers, Enantiomers, Mutarotation
- Glycosaminoglycan's (mucopolysaccharides)

**LIPIDCHEMISTRY**

- Definition, classification with examples.
- Classification and Functions of Fatty Acids, Phospholipids, Lipoproteins
- Structure and function of cholesterol
- Sources and functions of ketone bodies

**UNIT-II** **(12hrs)**

**AMINOACID CHEMISTRY**

- Definition, Classification of Amino Acids with Examples.
- Definition, Classification of Proteins with Examples
- Structural organization of proteins
- Biologically important peptides
- NUCLEIC ACIDS AND NUCLEOTIDE CHEMISTRY
- Composition and Function of Nitrogen bases, Nucleosides, Nucleotides
- Structure and Function of DNA
- Structure, Types, and Functions of RNA
- Differences between DNA and RNA

## UNIT-III (12hrs)

### ENZYMES

- Definition, Classification of Enzymes with Examples
- Active site, Enzyme specificity.
- Factors affecting enzyme activity
- Enzyme inhibition
- Iso enzymes and their clinical significance, creatine kinase, ALP

### VITAMINS

- Definition, Classification
- Fat-soluble Vitamins-Sources, RDA, Functions, and Deficiency.
- Water-soluble Vitamins-Sources, RDA, Functions, and Deficiency

## UNIT-IV (12hrs)

### INTERMEDIARYMETABOILISM

- Glycolysis
- TCA cycle
- B-oxidation of fatty acids (Palmitic acid)
- Ketone body formation and utilization, Urea cycle

## UNIT-V (12hrs)

### MINERAL METABOLISM

- Definition, Classification. Sources, RDA, Functions, and Deficiency of Calcium, Phosphorus, Iron, Sodium, Potassium

### CLINICAL BIOCHEMISTRY

- Normal and abnormal constituents of urine and blood and their clinical significance:
- Normal constituents:
- Organic: Urea, Uric acid, Creatinine
- Inorganic: Ca, phosphate, chloride, electrolytes
- Abnormal constituents:
- Glucose, Ketone bodies, Protein, Blood, Bile salts, Bile Pigments

### RECOMMENDED TEXT BOOKS

1. Essentials of Biochemistry by U. Satya Narayana.
2. Textbook of Biochemistry for Medical Students. DM Vasudeva
3. Integrated textbook of Biochemistry Volume-land II.Indumathi.
4. Textbook of Biochemistry for Medical Students.MN Chatterjee and Rana Shinde.
5. Illustrated Biochemistry.
6. Essentials of Biochemistry. Pankaja Naik

## 4.SOCIOLOGY

**L/T/P/C**
**2/-/-/2**

### Learning Objectives:

- Understand basic concepts of sociology and society
- Study social determinants of health
- Learn patient behavior and cultural influences
- Understand healthcare systems and social issues

### Learning Outcomes:

Students will be able to:

- Explain social factors affecting health and illness
- Demonstrate understanding of patient behavior
- Communicate effectively in diverse social settings
- Apply sociological concepts in healthcare delivery

**(30 hrs)**

### UNIT 1 (6hrs)

1. Introduction

- Meaning- Definition, Nature and Scope of Sociology
- Methods of Sociological Investigations, Case Study, Social Survey, Questionnaire, and Interview methods.
- Importance of its study with special reference to Health Care Professionals.

2. Social Factors in health and disease situations:

- Role of Social factors in health
- Role of social factors in illness
- Decision-making in taking treatment

### UNIT II (6hrs)

1. Socialization:

- Definition and Meaning of Socialization
- Primary, Secondary, and Anticipatory socialization
- Agencies of Socialization

2. Social Groups:

- Definition and Features of Social Group
- Primary Social Group
- Secondary Social Group
- The role of Primary and Secondary Groups in Hospitals.

### UNIT III (6hrs)

1. Family:

- The family, meaning, and definition
- Functions of the family

- Changing family patterns
- Influence of Family on the individual's health, the effects of sickness in the family.

2. Community:

- Rural community: meaning and features- Health problems of the rural community.
- Urban community: meaning and features - Health problems in urban areas.

**UNIT IV (6hrs)**

1. Culture and Health:

- Concept of Health
- Concept of Culture
- Cultural factors affecting Health and diseases

2. Social Change:

- Meaning of social change
- Factors of social change
- Human adaptation and social change
- Social Planning and Health

**UNIT V (6hrs)**

1. Social Problems:

- Population explosion
- Juvenile delinquency
- Alcoholism
- Unemployment
- Poverty
- Problems of women

2. Social Security:

- Social security and social legislation

**RECOMMEMDED TEXT BOOKS**

1. Principles of Sociology --- C.N. Shankar Rao
2. Sociology for physiotherapy students--K.P. Neeraja

## 5.ENGLISH AND COMMUNICATION SKILLS

**L/T/P/C**

**2/-/-/2**

**COURSE OBJECTIVES**

- To enhance the lexical and grammatical skills of the learners.
- To develop reading competencies for academic and professional requirements.
- To write effectively to meet professional needs.
- To hone speaking and listening skills.
- To enhance empathy and other vital interpersonal skills of the learners **(30 hrs)**

### UNIT1: Sympathy (Poem) by Charles Mackay **(6hrs)**

Reading-Reading and its importance, techniques of effective reading.

Writing-Paragraph Writing (Topic sentence, Supporting sentences, and Conclusion) Grammar - Parts of Speech (Parsing), Articles

**ELCSLAB**

CALLLAB : Phonetics- Vowel Sounds (Monophthongs and Diphthongs)

Listening-Introduction to listening, Purpose of Listening, and Barriers to effective listening

### UNIT2: A Birthday Letter by Jawaharlal Nehru

Reading-Skimming and Scanning

Writing-Letter writing (Requests, Leave applications, Purchase letters, Letters in correspondence with medical insurance companies)

Grammar- Phrase, Clause and Sentence; Prepositions

**ELCSLAB**

CALLLAB: Phonetics- Consonant Sounds

Listening-Listening for gist and specific information

## UNIT3: The secret of work by Swami Vivekananda (6hrs)

Reading-Making inferences and predictions
Writing-E-mail writing

Grammar-Tenses, Reported speech vocabulary–food and life style, instrument & equipment

**ELCSLAB**

CALLLAB: Intonation

Listening- Listening and identifying facts and opinions

ICSLAB: Speaking-Role Plays (OET) (Giving and taking instructions, Interacting with and explaining processes, conditions and instructions to the patients and their attenders,

## UNIT4: All the world's a stage (Poem) by William Shakespeare (6hrs)

Reading-Reading for explicit and implicit meaning

Writing-Short essays: 2-ParagraphEssay, Thesis Statement

Grammar-Subject-Verbal agreement, Degrees of Comparison

**ELCSLAB**

CALLLAB: Consonant Clusters

Listening-Listen-Comprehend- Speak, Health Care

## UNIT5: Sister Nivedita: Calcutta's Angel of Mercy (Article/Essay) by MonidipaDey (6hrs)

Writing-Report writing (Analysing tests and Reporting patient condition) Grammar– Voice, If conditionals
Vocabulary-Health, Wellness, Medical Vocabulary/Terminology

**ELCSLAB**

CALLLAB: Past Tense Markers and Plural Markers

Listening- Listening tasks from OET and IELTS

**COURSE OUTCOMES**:

- Construct grammatically correct sentences with appropriate vocabulary.
- Analyse, interpret, and synthesise a diverse range of profession-specific concepts through better comprehension of the text.
- Draft various types of written communication pieces useful to their professional lives.
- Understand and apply norms of scientific communication and positive interpersonal communication.
- Listen effectively and speak fluently in formal and informal situations, especially in their workplace.

**TEXT BOOK:**

English for Nurses by Vijaya Laxmi Naidu. Nirali Prakashan. 2008.

**RECOMMENDED TEXT BOOKS**

Practical English Usage by Michael Swan. OUP. 1995. On Writing Well by William Zinsser, Harper Resource Book. 2001. Cambridge English for Nursing by Virginia Allum and Patricia McGarr. CUP. 2010. English for Nursing by Ross Wright and Bethany Cagnol.Pearson.2001.
English for Nursing- 2 by Maris Spada Symonds and Ross Wright. Pearson. 2001. Every day English for International nurses by Joy Parkinson and Chris Brooker. Elsevier. 2004. Oxford English for Career Nurses by Tony Grice. Oxford University Press. 2007.

## 6.BASICS OF COMPUTERS

**L/T/P/C**
**1/-/2/2**

**COURSE OBJECTIVES:**

- To understand all components of a computer, different working environments, and computer operations.
- To learn how to create different types of Word documents, MS Excel manipulations, and PowerPoint documents.
- To understand basic requirements of computer network hardware, software, and its network architecture.

**(30 hrs)**

### UNIT–I (6hrs)

Introduction to computers--Definition of Computer-Characteristics of Computer Components of Computer Hardware–Memories–RAM and ROM–MB, GB, their conversions – Software: Application Software and Systems software- Data and Information –Different computer languages- Number systems- Binary and decimal conversions.

### UNIT–II (6hrs)

MS Word: Typing text in MS Word–Manipulating text¬ text–formatting text–using different font sizes, bold, italic– bullets and numbering –Pictures, Aligning the text and justify– choosing paper size– adjusting margins– header and footer, inserting page numbers in a doc– printing a file with options–using spell check and grammar–find and replace– mail merge– insert tables in a document**.**

### UNIT–III (6hrs)

MSEXCEL: Creating MS Excel – Cell editing, using formulas and functions, manipulating data with Excel–using sort function to sort numbers and alphabets–drawing graphs and charts using data in Excel.

MSPOWERPOINT: Slide transition and animation-slides with sounds–inserting clip arts– Pictures, tables, and graphs.

### UNIT–IV (6hrs)

Introduction to Computer Networks: Introduction, Computer Network Devices(Hubs, Switches, Routers, Gateway, Bridge, Modems, Wireless Access Points, Firewalls & NIC), Types of computer Networks (LAN, MAN&WAN), Network Topologies(Star, Ring, Mesh, Tree, Hybrid Topologies), Internet Based Applications, Advantages & Disadvantages of Computer Networks, E-Mail, Components of E-Mail, Attaching Files in E-mail, Different Search Engines.

**UNIT–V (6hrs)**

Introduction to Artificial Intelligence & ML: History of AI, Sub Areas of AI, Applications of Healthcare, Benefits of AI in Healthcare, Challenges of AI in Healthcare, Introduction to Machine Learning, Applications of Machine Learning, Machine Learning Algorithms, Real-world Machine Learning Use Cases.

**COURSE OUTCOMES:**

- At the end of the course, the student will be able
- Tounderstandperipheralsofthecomputerhowitworksandunderstandvarious languages of the computer.
- To create any kind of presentations for presenting their knowledge anywhere in the form of a document or PPT.
- To create Excel sheets to save data and process the data efficiently.
- To understand basic requirements of computer network hardware, software, and its network architecture.

**RECOMMENDED TEXT BOOKS**

Computer Fundamentals by Goel, Anita Pearson

Computer Fundamentals: Concepts, Systems & Applications-8thEditionbyPritiSinha, Pradeep K., Sinha

MS-Office2010TrainingGuidebyProf.SatishJain, M. Geetha, Computer Networks, Andrews Stanenbaum, 5th Edition, Pearson Education
Artificial Intelligence: A Modern Approach, Stuart J. Russell and Peter Norvig, Third Edition, Pearson Education

Hands-on Machine Learning with Scikit-Learn, Keras, and Tensor Flow, Aurelien Geron-O'Reilly, 2nd Edition.

## 7.HUMAN ANATOMY- I Practical

**L/T/P/C**

**-/-/2/2**

Human anatomy practicals for physiotherapy students are essential for understanding the structure of the human body, its systems, and their functional relationships. These practicals focus on giving students hands-on experience in identifying anatomical structures, learning dissection techniques, and understanding the musculoskeletal, nervous, and cardiovascular systems, all of which are vital for effective physiotherapy practice.

### Learning Objectives:

- Identify anatomical structures through models/specimens
- Develop observation and identification skills
- Understand practical aspects of anatomy
- Correlate theory with practical knowledge

### Learning Outcomes:

Students will be able to:

- Identify major anatomical structures
- Demonstrate basic dissection/model study skills
- Correlate anatomical structures with functions
- Apply anatomical knowledge in clinical practice

### GROSS SPECIMENS/SPOTTERS (30 hrs)

Upper Extremity

Identify the spotter-(Cross section of shoulder Joint, Elbow Joint, Wrist complex, Hand)

Identify the bone- upper extremity bones (Scapula, Clavicle, Humerus, Radius and Ulna, Carpals, Metacarpals, and Phalanges), including side determination.

Surface Anatomy of the Upper Extremity–upper extremity bones and muscles

Myology-(cadaveric spotter) Spotters of the upper extremity muscles, including the origin, insertion, blood supply, and nerve supply

Spotters of Blood vessels (Pro funda Brachii, Brachial, Radial, Ulnar). Spotter of Nerves (Axillary, Musculocutaneous, Radial, Median, Ulnar) Structure and Parts of the Breast-Spotter Cardio-vascular and Respiratory Anatomy Gross Specimen of Heart, Lung Spotters of the Bronchial tree, Bronchopulmonary segments Myology-(Diaphragm, Intercostal muscles and Accessory Muscles) Systemic Anatomy Gross Specimen/Spotter (Stomach, Liver, Gall Bladder, Spleen, Pancreas, Intestines, Kidney, Uterus)

Cross-section of the Kidney

Spotters of Glands- (Pituitary Gland, Thyroid Gland, Adrenal Gland, Parathyroid, Pineal Gland)

## 8.HUMAN PHYSIOLOGY–I Practical

**L/T/P/C**

**-/-/2/2**

### Learning Objectives:

- Perform basic physiological experiments
- Learn measurement of vital parameters
- Understand normal physiological values
- Develop laboratory skills

### Learning Outcomes:

Students will be able to:

- Measure and record physiological parameters (BP, pulse, etc.)
- Perform basic laboratory experiments
- Interpret normal physiological data
- Maintain accuracy and safety in lab practices

### Human Physiology Practical for Basic Clinical Skills Development **(30 hrs)**

- These practicals typically align with the theoretical aspects of physiology and help students apply concepts to real-world clinical scenarios. Key Areas Covered in Human Physiology for this semester include the following.-
- Determination of blood group,
- Estimation of haemoglobin concentration,
  Peripheral pulse determination,
- Auscultation of heart sounds,
- Determination of blood pressure,
  Auscultation of breath sounds,
- Assessment of respiratory rate,
  Anthropometric assessment (BMI&WHR)

## 9.ENVIRONMENTAL AWARENESS

**L/T/P/C**

**2/-/-/2**

**Learning Objectives:**

- Understand environmental issues and sustainability
- Learn impact of environment on health
- Study pollution, waste management, and conservation
- Promote environmental responsibility

**Learning Outcomes:**

Students will be able to:

- Explain environmental factors affecting health
- Demonstrate awareness of pollution and control measures
- Apply principles of waste management in healthcare
- Promote environmentally responsible practices

**(30 hrs)**

**Unit 1 Introduction to Environmental Awareness (3 hrs)**

What is environmental awareness?
The importance of environmental education.
Key environmental concepts: ecosystems, biodiversity, sustainability.
Historical perspective on environmental awareness.

**Unit 2 Earth's Ecosystems and Biodiversity (3 hrs)**

What are ecosystems?
Types of ecosystems: forests, oceans, wetlands, etc.
Importance of biodiversity.
Threats to biodiversity: habitat loss, invasive species, climate change.

**Unit 3 Pollution and Its Impact (3 hrs)**

Types of pollution: air, water, soil, noise, and light pollution.
Causes and effects of pollution on health and ecosystems.
Case studies of major pollution events.

**Unit 4 Climate Change and Global Warming (3 hrs)**

The science of climate change.
Greenhouse effect and human contributions.
Impacts of climate change: rising temperatures, sea levels, extreme weather.
Mitigation and adaptation strategies.

**Unit 5 Resource Conservation (3 hrs)**

Renewable vs. non-renewable resources.
The importance of conserving water, energy, and other resources.
Techniques for conservation: recycling, energy efficiency, and water-saving practices.

**Unit 6 Sustainable Agriculture and Food Systems (3 hrs)**

Environmental impact of conventional farming practices.
Sustainable agriculture: organic farming, permaculture, and agroecology.

The role of diet in environmental sustainability.

**Unit 7 Waste Management (3 hrs)**
Types of waste: municipal, industrial, hazardous, electronic.
The 3 Rs: Reduce, Reuse, Recycle.
Landfills, incineration, and composting.
Zero waste lifestyle.

**Unit 8 Water Conservation and Management (3 hrs)**
The global water crisis: causes and consequences.
Water management practices and policies.
The importance of clean water for all living organisms.

**Unit 9 Environmental Policy and Legislation (3 hrs)**
Global environmental treaties: Paris Agreement, Kyoto Protocol.
National environmental policies and regulations.
Role of NGOs, governments, and individuals in policy development.

**Unit 10 Green Technologies and Innovations (3 hrs)**
Introduction to renewable energy sources (solar, wind, hydro, etc.).
Electric vehicles and sustainable transportation.
Innovations in waste-to-energy and sustainable agriculture.

**The Role of Individuals in Environmental Protection**
How individual actions impact the environment.
Eco-friendly lifestyles: reducing waste, sustainable consumption, green travel.
Community action and grassroots movements.

**Reference Textbook**
Environmental Science: A Global Concern" by William P. Cunningham & Mary Ann Cunningham

**SEMESTER-II**

| S.NO. | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Human Anatomy – II | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Human Physiology - II | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Medical Microbiology | 3 | | - | 3 | 30 | 70 | 100 |
| 4 | | Pathology | 3 | | - | 3 | 30 | 70 | 100 |
| 5 | | Pharmacology | 3 | | - | 3 | 30 | 70 | 100 |
| 6 | | Health Psychology | 2 | | - | 2 | 30 | 70 | 100 |
| 7 | | Human Anatomy – II Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 8 | | Human Physiology – II Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 9 | | Stress Management | 1 | | | 1 | 100 | - | 100 |
| | | **TOTAL** | **20** | | **4** | **24** | **340** | **560** | **900** |

## 1.HUMAN ANATOMY–II

**L/T/P/C**
**4/-/-/4**

### Learning Objectives:

- Understand detailed anatomy of nervous, digestive, urinary, and endocrine systems
- Study regional and applied anatomy relevant to clinical practice
- Learn anatomical basis of common diseases and procedures
- Develop correlation between structure and function

### Learning Outcomes:

Students will be able to:

- Describe anatomy of major organ systems in detail
- Identify anatomical structures relevant to clinical practice
- Correlate anatomy with disease conditions and procedures
- Apply anatomical knowledge in emergency and clinical settings

**(60 hrs)**

**UNIT-I** **(12 hrs)**

**LOWER EXTREMITY:**

1. Osteology, including features, side determination, muscular attachment, clinical and applied anatomy of the following lower extremity bones: Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals, and phalanges.

2. Myology: Origin, insertion, nerve supply, action, function, clinical and applied anatomy

3.Anterior compartment of the thigh, Medial compartment, and Posterior compartment

4.Gluteal Region

5.Anterior aspect of leg, medial and lateral aspect, Posterior aspect of leg

6.Dorsum foot

**UNIT-II (12 hrs)**

**LOWER EXTREMITY:**

1. Arthrology: Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy, including Radiography

2. Hip Joint, Knee Joint, Ankle Joint, and joints of the foot.

3. Femoral triangle, femoral canal, and inguinal canal, Adductor canal, popliteal fossa, arches of the foot

4. Lumbar plexus, Sacral plexus, Nerves of the Lower Extremity, including cutaneous nerves

5. Blood vessels and lymphatic drainage

**UNIT-III (12 hrs)**

**VERTEBRAL COLUMN AND PELVIC GIRDLE:**

1. Atypical and typical vertebra

2. Structure and features of Cervical, thoracic, lumbar, sacral, and coccygeal vertebrae

3. Origin, insertion, nerve supply, and actions of pre- and para-vertebral muscles

4. Muscles of Trunk and Abdomen

5. Core Muscle Anatomy

6. Joints of the vertebral column, structure and composition of the intervertebral disc, including the Radiography Evaluation

7. Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy, including Radiography of the Sacro-

Iliac joint

8. The pelvic floor, including Applied Anatomy

**UNIT-IV** **(12 hrs)**

**HEADANDNECK:**

1. Bones of the skull and face

2. Muscles of the face and neck

3. Triangles of the neck

4. Gross anatomy of the eyeball, nose, ears, and tongue

**UNIT-V** **(12 hrs)**

**NEUROANATOMY:**

1. General organisation of the Nervous System

2. Central Nervous System-Gross Structure of Brain and Spinal Cord

3. Diencephalon- Gross Structure of Thalamus, Hypothalamus, Basal Ganglia

4. Meninges and Coverings of the Spinal Cord

5. Cerebro-Spinal Fluid and ventricles of the brain

6. Spinal Cord-Segmental features, Laminae, Nuclei, Tracks of the spinal cord

7. Spinal nerves, nerve root ganglia

8. Blood supply to the brain and spinal cord with clinical and applied anatomy

9. Peripheral Nervous System

10. Cranial nerves – Course and applied Anatomy Neuromuscular junction

**RECOMMENDED TEXT BOOKS**

1. Human Anatomy– Snell
2. Anatomy-Chaurasia, Volume I, II&III
3. Neuroanatomy– Inderbirsingh
4. Human Anatomy– Kadasne, Volume I and III
5. Neuroanatomy— Vishrsam Singh
6. Human Anatomy– Datt

## 2.HUMAN PHYSIOLOGY–II

**L/T/P/C**

**4/-/-/4**

### Learning Objectives:

- Understand advanced physiology of organ systems
- Learn neurophysiology, renal, endocrine, and digestive functions
- Study physiological regulation and homeostasis mechanisms
- Correlate physiology with disease states

### Learning Outcomes:

Students will be able to:

- Explain functions of advanced body systems
- Interpret physiological changes in disease conditions
- Understand regulatory mechanisms of the human body
- Apply physiological concepts in clinical scenarios

**(60 hrs)**

**UNIT-I** **(12 hrs)**

**NERVOUS SYSTEM - I**

1. Introduction to the Nervous System-CNS and ANS

2. Neurotransmitters-Definition, neurotransmitter, types

3. Synapse-Definition, type, structure, transmission of impulse across a synapse, properties.

4. Receptors and Sensation-Types of sensations, Classification of receptors, properties

5. Sensory System-Organization of the sensory system, sensory Homunculus

6. Ascending Tracts-Definitions, Neuronal composition of ascending tracts, dorsal column, anterolateral tract

7. Pathophysiology of Pain-Definitions, hyperalgesia, and allodynia, deep pain, referred pain and its theories, management of chronic pain, endogenous opioid analgesic system

8. Motor Cortex - Cerebrum, cortical areas of the brain, motor homunculus, cerebral dominance, connections, and mapping the functional areas of the brain

9. Descending Tracts-Pyramidal system, extrapyramidal system

## UNIT-II (12 hrs)

**NERVOUSSYSTEM-II**

1. Spinal cord - Introduction, effects of complete transection of the spinal cord, effects of hemi-section of the spinal cord (Brown-Sequard Syndrome)

2. Reflexes-Reflex action, reflex arc, classification, properties, types: conditioned reflex, stretch reflex, inverse stretch reflex, withdrawal reflex, crossed extensor reflex, superficial reflexes(Plantar & Abdominal)

3. Connections, Functions, and Applied Aspects of the Thalamus, Hypothalamus, Cerebellum, and Basal Ganglia. Regulation of tone, Posture, and its reflexes, equilibrium, and vestibular apparatus

5. Limbic system, Reticular Activating System, Sleep and its types, sleep disorders, Electroencephalogram (EEG)

6. Higher Functions: Learning, Memory, Speech

7. Autonomic Nervous System - Sympathetic division, Parasympathetic division, control of autonomic functions

8. Cerebrospinal fluid-Formation and circulation, composition and properties, functions, applied aspect - Hydrocephalus, lumbar puncture

## UNIT-III (12 hrs)

**SPECIALSENSES:**

1. Vision-Anatomy, visual pathway, pupillary reflexes, dark adaptation, light adaptation, photosensitivity

2. Hearing-Anatomy, auditory pathway, tests for hearing- Watch test, Rinne's test, Weber's test, deafness, Audiometry

3. Taste and Smell: Taste sensations, taste pathway, olfactory pathway

**ENDOCRINOLOGY:**

1. Hormones-Definition, types, hormonal chemistry, regulation, hormone receptor, mechanism of action

2. Secretion, regulation, function, and applied aspects of the Hypothalamus, Pituitary Gland, Thyroid Gland, Parathyroid Gland, Pancreas, and Adrenal Gland.

**UNIT-IV** **(12 hrs)**

**REPRODUCTIVE SYSTEM:**

1. Sex determination and differentiation, its abnormalities, puberty, importance of sex hormones

2. Female reproductive system-Internal and external genital organs, Oogenesis, Structure of egg, Follicle development, ovulation, menstrual cycle, menopause

3. Male reproductive system-Testes, accessory sex organs, Spermatogenesis, structure of sperm

4. Physiology of pregnancy - Fertilization, Implantation, Placenta(formation, function, hormones), maternal changes during pregnancy, pregnancy tests, infertility

5. Childbirth Physiology-Parturition, Lactation

**UNIT-V** **(12 hrs)**

**GASTROINTESTINAL SYSTEM:**

1. Physiological stages of digestion

2. Liver function

**EXCRETORY SYSTEM:**

1. Kidneys – structure & function

2. Urine formation (to exclude concentration and dilution)

3. Juxta glomerular apparatus

4. Fluid and electrolyte balance–Na, K, H2O

5. Neural control of micturition and diuresis

6. Applied Physiology: Types of Bladders

**RECOMMENDED TEXT BOOKS**

1. Textbook on Medical Physiology–Guyton

2. Textbook of Physiology–AK Jain

## 3.MEDICAL MICROBIOLOGY

**L/T/P/C**

**3/-/-/3**

### Learning Objectives:

- Understand microorganisms and their role in disease
- Learn classification, structure, and growth of microbes
- Study infection mechanisms and immune response
- Understand sterilization and infection control

### Learning Outcomes:

Students will be able to:

- Identify major pathogenic microorganisms
- Explain mechanisms of infection and transmission
- Apply infection control and prevention techniques
- Interpret microbiological test results

**(45 hrs)**

**a) Morphology** **(5 hrs)**

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

**b) Growth and nutrition.-** **(5 hrs)**

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

**c) Culture media.-** **(5 hrs)**

Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.

**d) Sterilization and Disinfection.-** **(5 hrs)**

Principles and use of equipment of sterilization, namely, hot air oven, autoclave, serum inspissation, pasteurization, antiseptics and disinfectants.

**e) Immunology. -** **(5 hrs)**

Immunity, vaccines, types of vaccines, and immunization schedules, principles, and interpretation of common serological tests, namely Widal, VDRL, ASLO, CRP, RF & ELISA.

Rapid tests for HIV and HB Ag (excluding technical details).

**f) Systematic Bacteriology.-** **(5 hrs)**

Morphology, cultivation, diseases caused, laboratory diagnosis, including specimen collection of the following bacteria (excluding classification, antigenic structure, and pathogenicity),

Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci,

C. diphtheria, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella,
E. coli, Klebsiella, Proteus,

Vibriocholerae, Pseudomonas & Spirochetes.

**g) Parasitology.-** **(5 hrs)**

Morphology, life cycle, and laboratory diagnosis of the following parasites: E.histolytica, Plasmodium, tapeworms, Intestinal nematodes

**h) Mycology. -** **(5 hrs)**

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

**i)Virology -** **(5 hrs)**

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

**RECOMMENDED TEXT BOOKS**

a. Microbiology, Anantha Narayan and Paniker's,

b. CP.Baveja. Textbook of Microbiology for Nurses.

c. A textbook of Microbiology-Chakraborty.

.

## 4.PATHOLOGY

**L/T/P/C**

**3/-/-/3**

### Learning Objectives:

- Understand basic disease processes and mechanisms
- Learn cellular injury, inflammation, and healing
- Study common disease conditions affecting organ systems
- Correlate pathology with clinical findings

### Learning Outcomes:

Students will be able to:

- Explain pathological changes in diseases
- Identify causes and progression of disease processes
- Correlate clinical symptoms with pathology
- Interpret basic pathological reports

**(45 hrs)**

**UNIT:1** **(7 hrs)**

**Cellular adaptation, Cell injury & cell death.-**

- Introduction to pathology.
- Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation.
- Overview of cell injury and cell death.
- Causes of cell injury. Mechanisms of cell injury.
- Reversible and irreversible cell injury.
- Examples of cell injury and necrosis.

**UNIT-II** **(7 hrs)**

**Inflammation.-**

- General features of inflammation: Historical highlights
- Acute inflammation
- Chemical mediators of inflammation: Outcomes of acute inflammation. Morphologic patterns of acute inflammation: Summary of acute inflammation
- Chronic inflammation

**UNIT-III** **(7 hrs)**

**Immunity Disorders.-**

- General features of the immune system, Disorders of the immune system

**UNIT-IV** **(8 hrs)**

**Infectious diseases.-**

- General principles of microbial pathogenesis and viral infections.
- Bacterial infections-Rheumatic heart disease.
- Fungal infections.
- Parasitic infections

**UNIT-V** **(8 hrs)**

**Neoplasia.-**

- Definitions Nomenclature.
- Biology of tumour growth, benign and malignant neoplasms, Epidemiology.
- Carcinogenic agents and their cellular interactions. Clinical features of tumours.

**UNIT-VI** **(8 hrs)**

**Environmental and nutritional disorders.-**

- Environmental disease.
- Common environmental and occupational exposures: Nutrition and disease.
- Coronary artery disease.

**RECOMMENDED TEXT BOOKS**

Pathology, Harsh Mohane. Basic Pathology by Robbins

## 5.PHARMACOLOGY

**L/T/P/C**

**3/-/-/3**

### Learning Objectives:

- Understand principles of drug action and classification
- Learn pharmacokinetics and pharmacodynamics
- Study commonly used emergency and ICU drugs
- Understand adverse drug reactions and interactions

### Learning Outcomes:

Students will be able to:

- Identify and classify commonly used drugs
- Explain mechanisms of drug action
- Understand safe drug administration practices
- Monitor and report drug effects and reactions

**(45 hrs)**

**UNIT-I** **(9 hrs)**

**General Pharmacology**

a) Absorption, distribution, metabolism, and elimination of drugs,

b) Routes of drug administration.

c) Adverse reactions to drugs.

d) Factors modifying drug response

**UNIT-II** **(9 hrs)**

**Autonomic nervous system & Peripheral nervous system**

a) Sympathetic nervous system-sympathomimetic, sympatholytic

b) Parasympathetic-Cholinergic, Anticholinergics

c) Skeletal muscle relaxants

d) Local anesthetics

**UNIT-III** **(9 hrs)**

**Central nervous system**

a) Drug therapy of various CNS disorders like epilepsy, depression.

b) Non-steroidal anti-inflammatory drugs

c) General anesthetics

**AUTOCOIDS**

a) Histamine and antihistaminic

**UNIT-IV (9 hrs)**

**Cardio vascular system**

a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias

b) Diuretics

c) Coagulants and anticoagulants, antiplatelet drugs

d) Hypo-lipidemics

**Gastro intestinal and respiratory system**

a) Drug treatment of peptic ulcer

b) Drug therapy of bronchial asthma

**UNIT-V (9 hrs)**

**Hormones**

a) Drug therapy for diabetes

b) Corticosteroids

c) Chemotherapeutic agents - β-Lactam Antibiotics, fluoroquinolones, aminoglycosides, tetracycline's, chloramphenicol

**RECOMMENDED TEXT BOOKS**

1. PadmajaUdaykumar-PharmacologyforDental&AlliedHealthSciences-4thedition, 2017.

2. Joginder Singh Pathania, Rupendra Kumar Bharti, Vikas Sood-Textbook of Pharmacology for Paramedical Students 2019

3. KDTripathi-EssentialsofPharmacology-8thedition,2018.

4. HLSharma &KK Sharma-Principles of Pharmacology- 3rdedition,2017.

## 6.HEALTH PSYCHOLOGY

**L/T/P/C**

**2/-/-/2**

### Learning Objectives:

- Understand psychological aspects of health and illness
- Learn patient behavior and coping mechanisms
- Study stress, anxiety, and chronic illness psychology
- Develop communication and counseling awareness

### Learning Outcomes:

Students will be able to:

- Recognize psychological factors affecting patients
- Communicate effectively with patients in distress
- Apply psychological principles in patient care
- Support patient coping and recovery processes

**(30 hrs)**

**UNIT – I** **(6 hrs)**

**Introduction to Psychology**

a) Schools: Structuralism, functionalism, behaviourism, Psychoanalysis.

b) Methods: Introspection, observation, inventory and experimental method.

c) Branches: pure psychology and applied psychology

d) Psychology and physiotherapy

**Growth and Development**

e) Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).

f) Heredity and environment: role of heredity and environment in physical and psychological development, “Nature v/s Nurture controversy”.

**UNIT – II** **(6 hrs)**

**Sensation, attention and perception**

a) Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.

b) Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants).

c) Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context).

d) Illusion and hallucination: different types.

**Motivation**

e) Motivation cycle (need, drive, incentive, reward).

f) Classification of motives.

g) Abraham Maslow's theory of need hierarchy

**UNIT – III** **(6 hrs)**

**Frustration and conflict**

a) Frustration: sources of frustration.

b) Conflict: types of conflict.

c) Management of frustration and conflict

**Emotions**

d) Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).

e) Theories of emotion

f) Stress and management of stress.

**Intelligence**

g) Theories of intelligence.

h) Distribution of intelligence.

i) Assessment of intelligence

**UNIT – IV** **(6 hrs)**

**Learning**

a) Factors effecting learning.

b) Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.

c) The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

**Thinking**

d) Reasoning: deductive and inductive reasoning

e) Problem solving: rules in problem solving (algorithm and heuristic)

f) Creative thinking: steps in creative thinking, traits of creative people

**UNIT – V** **(6 hrs)**

**Personality**

a) Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach.
b) Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

**c)** Defence Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

**Recommended books:**

1. Invitation to Psychology - Beena and Paremeshwaran.
2. General Psychology - S.K.Mangal.
3. Introduction to Health Psychology - Shelly E.Taylor.
4. Introduction to Psychology - Atkinson and Hilgard.
5. Introduction to Psychology - Morgan and king.
6. Psychology applied to modern life - Wayne Weiten Margareta L. Lord.
7. Psychology and Sociology for GNM and BPT student - Jacob Anthikad

## 7.HUMAN ANATOMY PRACTICAL–II

**L/T/P/C**

**-/-/2/2**

**Learning Objectives:**

- Identify anatomical structures using models and specimens
- Correlate theoretical anatomy with practical observation
- Develop clinical orientation to anatomy
- Improve observational skills

**Learning Outcomes:**
Students will be able to:

- Identify major structures of organ systems
- Demonstrate applied anatomical knowledge
- Correlate anatomical findings with clinical relevance
- Develop practical anatomy skills for healthcare use

**(30 hrs)**

**GROSSSPECIMENS/SPOTTERS**

**SPINE, PELVISANDLOWEREXTREMITY**

Identify the spotter- Osteology- Identify the bone, LOWER EXTREMITY BONES (Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges). Including side determination, Spinal Segments, Vertebrae (Cervical, Thoracic, Lumbar, Sacral and Coccyx), Pelvis and Innominate Bones

Surface Anatomy of the Spine and Lower Extremity–Atlas, Axis, C-7 vertebrae, Spinous and Transverse processes of the vertebrae, Locate the Innominate bone, ASIS and PSIS, Coccyx, Sacrum, Greater Trochanter, Condyles of the femur, Patella, Tibia Tubercles and condyles, Shin Bone, Tarsal bones, Malleoli.

Myology- (cadaveric spotter) Spotters of the lower extremity muscles, including the origin, insertion, blood and nerve supply.

Arthrology- (Cross-sectional Hip Joint, Knee Joint, Ankle Joint, Joints of Foot, Pelvic Joints, Joints of Spine, Intervertebral Joints, Facet Joints, Sacro-Iliac Joints)

Abdominal muscles, pre- and paravertebral muscles, pelvic floor muscles, Popliteal Fossa, Inguinal Canal, Arches of the foot, and Spotters of blood vessels.

**NEURO-ANATOMY IDENTIFY THE SPOTTER**

Cross-Section of the Skull, Sinuses of the
Skull, Muscles of the Skull and Face,
Triangles of the Neck **SYSTEMIC**

**ANATOMY**
Gross Specimen/Spotter (Brain and Spinal Cord) Cross-section of brain and spinal cord. Identify the spinal nerves. Cranial Nerves

## 8.HUMAN PHYSIOLOGY PRACTICAL–II

**L/T/P/C**

**-/-/2/2**

### Learning Objectives:

- Perform advanced physiological experiments
- Learn clinical interpretation of physiological data
- Understand diagnostic physiological tests
- Develop laboratory skills in physiology

### Learning Outcomes:

Students will be able to:

- Conduct and record physiological experiments
- Interpret clinical physiological data
- Measure and analyze body system functions
- Apply physiological techniques in clinical practice

**(15 hrs)**

### Neurological Examination Techniques and Clinical Assessment

Examination of superficial sensations, Examination of deep sensations, Examination of cortical sensations, Examination of reflexes, Cranial nerve examination, Examination of balance and coordination

## 9.STRESS MANAGEMENT

**L/T/P/C**

**1/-/-/1**

**Learning Objectives:**

- To understand the concept, causes, and types of stress.
- To identify physical, emotional, and behavioral responses to stress.
- To learn various stress management and coping techniques.
- To develop skills for maintaining mental well-being and resilience.
- To promote a balanced lifestyle in personal and professional life.

**Learning Outcomes:**

- Explain the causes and effects of stress on health.
- Identify personal stressors and recognize stress symptoms.
- Apply effective stress management techniques such as relaxation, time management, and coping strategies.
- Demonstrate improved emotional control and resilience.
- Maintain a healthy balance between personal and professional responsibilities.

**(15 hrs)**

### UNIT I (3 hrs)

- Introduction to Stress and Its Effects Definition of stress: Eustress vs. Distress Types of stress: Acute vs. Chronic
- The biology of stress (fight-or-flight response, hormones)
- Short-term and long-term effects on physical and mental health: The role of perception and coping mechanisms

### UNIT II (3 hrs)

- Identifying Stressors and Personal Stress Responses
- Internal vs. external stressors (work, relationships, environment) Identifying stress patterns (thoughts, behaviors, physical reactions) Emotional regulation and its role in stress management
- The Stress Process: How stress develops and escalates

### UNIT III (3 hrs)

- Coping Strategies and Stress Relief Techniques
- Problem-focused. emotion-focused coping
- Cognitive Behavioral Therapy(CBT)techniques forstress
- Relaxationtechniques(deepbreathing,progressivemusclerelaxation)Timemanagement and organization as stress-relief tools
- Developing a personal coping plan

### UNIT IV (2 hrs)

- Lifestyle Changes for Managing Stress: The role of physical activity and exercise, SleephygieneanditsconnectiontostressNutritionanditsimpactonmentalhealthSocial support and

healthy relationships, Mindfulness and meditation practices

**UNIT V** **(2 hrs)**

- Stress ManagementatWork and School
- Managing work and school stress: Time management, prioritization, pressure environments and deadlines
- Building resilience and avoiding burnout
- The importance of taking breaks and practicing self-care

**UNIT VI** **(2 hrs)**

- Building Long-Term Stress Resilience
- Resilience theory and how to bounce back from adversity, developing a growth mindset to handle challenges. Building emotional intelligence to cope with stress. Integrating stress management into daily life

**RECOMMENDED TEXT BOOKS**

Stress Management: From Basic Science to Best Practice

## SEMESTER – III

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Emergency Medical Services | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Critical Concepts and Management | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Instrumentation In Emergency Medical Service | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Medical Law, Ethics & Medical Records | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Emergency Critical Concepts and Management Practical | - | - | 5 | 5 | 30 | 70 | 100 |
| 6 | | Soft Skills Development | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **18** | **-** | **5** | **23** | **250** | **350** | **600** |

## 1. EMERGENCY MEDICAL SERVICES

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand the structure and function of emergency medical systems.
- To learn pre-hospital care principles and patient transport.
- To develop skills in triage and emergency response coordination.
- To gain knowledge of ambulance services and communication systems.

**Learning Outcomes:**

- Explain the organization and components of emergency medical services.
- Perform basic triage and prioritize patient care effectively.
- Demonstrate safe patient transport techniques.
- Apply communication protocols in emergency scenarios.

**(60 hrs)**

**UNIT I** **(12 hrs)**

**Introduction to Emergency Medical Service (EMS)**

1. Definition, scope, and importance of EMS
2. History and evolution of EMS systems
3. Components and organisation of EMS (prehospital & hospital)
4. Roles and responsibilities of EMTs, paramedics, and emergency nurses
5. Levels of EMS providers and their competencies

6. Ambulance types, design, and essential equipment
7. Communication systems and coordination with emergency dispatch
8. Documentation, reporting, and record keeping in EMS
9. Infection control and safety measures in EMS practice
10. Ethical and legal considerations in emergency medical services

## UNIT II (12 hrs)

**Prehospital Care and Triage**

1. Scene size-up and safety assessment
2. Primary survey (Airway, Breathing, Circulation)
3. Secondary survey and focused patient assessment
4. Vital signs monitoring and interpretation
5. Patient positioning, lifting, and moving techniques
6. Triage principles and methods (START, SALT, colour coding)
7. Airway management: manual manoeuvres and airway adjuncts
8. Oxygen therapy and basic life support principles
9. Communication and coordination with receiving facilities
10. Medico-legal issues and documentation during prehospital care

## UNIT III (12 hrs)

**Management of Medical Emergencies**

1. Cardiovascular emergencies: cardiac arrest, angina, MI
2. Respiratory emergencies: asthma, COPD, pulmonary oedema
3. Neurological emergencies: stroke, seizures, head injury
4. Endocrine emergencies: hypoglycaemia, diabetic ketoacidosis
5. Gastrointestinal emergencies: GI bleeding, pancreatitis
6. Renal and electrolyte emergencies
7. Poisoning and drug overdose management
8. Allergic reactions and anaphylaxis management
9. Shock: types, recognition, and management
10. Sepsis and infectious disease emergencies

## UNIT IV (12 hrs)

**Management of Trauma and Surgical Emergencies**

1. Principles of trauma assessment and management (ABCDE)
2. Head and spinal injuries: stabilisation and care
3. Chest injuries: pneumothorax, hem thorax, flail chest
4. Abdominal trauma: blunt and penetrating injuries
5. Musculoskeletal trauma and fracture management
6. Haemorrhage control and fluid resuscitation
7. Burns: classification, assessment, and emergency care
8. Electrical and chemical injuries management

9. Obstetric and gynaecological emergencies: eclampsia, PPH
10. Emergency wound care and suturing techniques

## UNIT V (12 hrs)

**Disaster Management and Special Situations**

1. Definition, classification, and phases of disasters
2. Disaster preparedness planning and mitigation strategies
3. Mass casualty triage and field organisation
4. Disaster communication and coordination systems
5. Biological, chemical, and radiological emergencies
6. Environmental emergencies: heat stroke, hypothermia, drowning
7. Paediatric emergencies: respiratory distress, febrile seizures, shock
8. Geriatric emergencies and challenges in elderly care
9. Psychiatric and behavioural emergencies
10. Role of EMS in disaster recovery and rehabilitation

## RECOMMENDED TEXT BOOKS

**1.** Tintinalli's Emergency Medicine: A Comprehensive Study Guide – **Tintinalli JE**
**2.** Prehospital Emergency Care – **Mistovich J., Karren K.**
**3.** Emergency Care and Transportation of the Sick and Injured – **AAOS**
**4.** Advanced Trauma Life Support (ATLS) Manual – **American College of Surgeons**
**5.** Basic and Advanced Life Support Manuals – **American Heart Association (AHA)**

## 2. EMERGENCY CRITICAL CONCEPTS AND MANAGEMENTS

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand pathophysiology of critical illnesses.
- To learn management of life-threatening emergencies.
- To develop decision-making skills in critical care settings.
- To familiarize with emergency protocols and guidelines.

**Learning Outcomes:**

- Identify signs and symptoms of critical conditions.
- Apply appropriate emergency management strategies.
- Interpret clinical data for decision-making in emergencies.
- Implement standard treatment protocols effectively.

**(60 hrs)**

**UNIT I** **(12hrs)**

i. Interpretation of ECG, Arrhythmias
ii. Congenital heart disease types, diagnosis, and management
iii. Cardiac failure
iv. Pulmonary embolism diagnosis, management
v. Pulmonary oedema diagnosis, management
vi. CPR (ACLS)

**UNIT II** **(12hrs)**

I. Management of Shock
ii. Management of Hypertension,

**UNIT III** **(12hrs)**

I. ECHO
ii. TEE
iii. Cardiac output monitoring
iv. CVP monitoring
v. Cath lab procedure

**UNIT IV** **(12hrs)**

I. ICP
ii. Condition with Raised ICP
iii. Management of raised ICP
iv. Diagnosis of brain dead
v. DNR (Do Not Resuscitate)
vi. Common surgeries done for raised ICP

**UNIT V** **(12hrs)**

i. Unconscious patient
ii. AVPU score and GCS

iii. Management of COMATOSE Patient
iv. Diagnosis of Brain death
v. Confirming brain Death and managing a brain death patient

**RECOMMENDED TEXT BOOKS**

1. The ICU book. Paul L Marino. 4th edition. Lippincott Williams & Wilkins

## 3. INSTRUMENTATION IN EMERGENCY MEDICAL SERVICES (EMS)

**L/T/P/C**
**4/-/-/4**

### Learning Objectives:

- To understand various emergency medical instruments and equipment.
- To learn principles of operation and maintenance of devices.
- To develop skills in handling monitoring systems.
- To ensure safety and accuracy in equipment usage.

### Learning Outcomes:

- Identify and operate emergency medical instruments.
- Demonstrate proper handling and troubleshooting of equipment.
- Interpret data from monitoring devices accurately.
- Maintain safety standards while using instruments.

**(45 hrs )**

**UNIT I** **(9 hrs )**

**Introduction to Biomedical Instrumentation in EMS**

1. Definition, scope, and importance of medical instrumentation
2. Basic principles of biomedical instrumentation
3. Classification of emergency medical instruments
4. Electrical safety in medical equipment
5. Power sources and battery systems for portable instruments
6. Maintenance, calibration, and performance checks
7. Sterilisation and infection control of emergency instruments
8. Overview of biomedical signal acquisition (ECG, EEG, BP)
9. Biomedical sensors and transducers used in EMS
10. Biomedical waste management and disposal

**UNIT II** **(9 hrs )**

**Monitoring Instruments in Emergency Care**

1. Patient monitoring systems – overview and components
2. ECG monitor – principle, working, and electrode placement
3. Blood pressure monitors – manual and automatic types
4. Pulse oximeter – principle, calibration, troubleshooting
5. Capnography – end-tidal $CO_2$ monitoring and clinical significance
6. Cardiac output monitoring devices
7. Temperature monitoring devices

8. Intracranial pressure (ICP) monitoring systems
9. Multi-parameter patient monitors (functions and interfaces)
10. Data recording, alarms, and interpretation in monitoring systems

## UNIT III (9 hrs)

**Life Support and Ventilation Equipment**

1. Airway management devices – oropharyngeal, nasopharyngeal airways
2. Laryngoscope and video laryngoscope – design and use
3. Suction apparatus – types, working, and maintenance
4. Oxygen delivery systems – cylinders, flow meters, humidifiers
5. Bag-valve-mask (BVM) resuscitators – working and technique
6. Mechanical ventilators – types, modes, and controls
7. CPAP and BiPAP machines – principles and applications
8. Nebulisers and humidification systems
9. Defibrillators and cardiac monitors – principles, safety, and types
10. Infusion pumps and syringe pumps in emergency care

## UNIT IV (9 hrs)

**Diagnostic and Therapeutic Instruments**

1. Portable ECG and echocardiography devices
2. Point-of-care testing instruments (blood glucose, ABG analysers)
3. Portable ultrasound and imaging systems in EMS
4. Glucometers and electrolyte analysers
5. Haemoglobin and hematocrit measuring devices
6. Portable X-ray units – basic components and safety
7. Automated external defibrillator (AED) – principle and use
8. Electrosurgical units (ESU) – principle, function, safety
9. Portable suction and airway visualisation devices
10. Emergency laboratory instruments (POC analysers, coagulometers)

## UNIT V (9 hrs )

**Telemedicine, Maintenance, and Emerging Technologies**

1. Introduction to telemedicine in EMS
2. Telemetry and remote patient monitoring systems
3. Data transfer, digital communication, and cloud integration in EMS
4. Biomedical equipment maintenance and servicing protocols
5. Troubleshooting and preventive maintenance techniques
6. Calibration standards and regulatory guidelines (BIS, NABH)
7. Biomedical equipment inventory and asset management
8. Integration of AI and IoT in emergency medical instruments
9. Simulation and training manikins in EMS education
10. Future trends in emergency care instrumentation (wearables, drones, mobile diagnostics)

**RECOMMENDED TEXT BOOKS**

1. Introduction to Biomedical Instrumentation – Carr & Brown
2. Medical Instrumentation: Application and Design – John G. Webster
3. Principles of Biomedical Instrumentation and Measurement – Cromwell L.
4. Emergency Medical Equipment Manual – WHO/UNICEF
5. Basic Life Support and Advanced Life Support Manuals – AHA
6. Clinical Engineering Handbook – Ernesto Iadanza

## 4. MEDICAL LAW/ ETHICS AND MEDICAL RECORDS

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand legal aspects of medical practice.
- To learn ethical principles in patient care.
- To develop knowledge of medical documentation and records.
- To ensure confidentiality and professional responsibility.

**Learning Outcomes:**

- Apply legal and ethical principles in clinical practice.
- Maintain accurate and complete medical records.
- Demonstrate professional behavior and accountability.
- Ensure patient confidentiality and informed consent.

**(45 hrs)**

**MEDICAL LAW**

**UNIT-I** **(3hrs)**

Medical ethics-Definition-Goal Scope, Introduction to Code of Conduct

**UNIT-II** **(3hrs)**

Basic Principles of Medical Ethics: Confidentiality, Malpractice, and Negligence-Rational and irrational drug therapy

**UNIT-III** **(3hrs)**

Autonomy and Informed Consent-Right of Patients Care of the terminally ill- Euthanasia

**UNIT-IV** **(3hrs)**

Organ transplantation

Medico legal aspects of medical records-Medico legal case and type-Records and documents related to MLC-ownership of medical records-Confidentiality Privilege communication Release of medical information- Unauthorized disclosure Retention of medical records-other various aspects.

Professional Indemnity insurance policy

**UNIT-V** **(3hrs)**

Developmentofstandardizedprotocoltoavoidnearmissorsentineleventsobtainingan informed consent

**RECOMMENDED TEXT BOOKS**

1. Law relating to medical negligence and compensation-Dr. K.P.D.A. K.P.D.A. Prabakar & Dr. Paulraj Joseph-2023

2. Atextbookofmedicaljurisprudenceandtoxicology-JusticeKKannan-25edition-1"edition-2016

3. LawthedoctormustknowHiteshJBhatt&GeetebdraSharma-2017

4. Law on Medical Negligence and Legal Remedies- Dr Annu Bahl Mehra & Harshit Kiran-2022

**RECORDKEEPING**

**UNIT-I (3hrs)**

Commonly Used Prefixes, Suffixes and Root Words in Medical Terminology, Common Latin Terms used in Prescription Writing, and Study of Standard Abbreviations.

**UNIT-II (3hrs)**

Medical Records Management. Meaning, functions, principles of recordkeeping, Importance of medical records to patients, doctors, and hospitals, classification of records like coding system, indexing system, types of forms, basic and special, legal aspects of medical records.

**UNIT-III (3hrs)**

International Classification of Diseases (ICD), Electronic Medical Record (EMR), Records Management: Registers, forms, retention and preservation of MR, Role of MRD personnel.

**UNIT-IV (3hrs)**

Medical Registers: Meaning, types, advantages of Medical Registers, registers used in various departments, Statutory registers and reports to be maintained-specimens

**UNIT-V (3hrs)**

Medical Audit: its process and importance in hospitals.

**RECOMMENDED TEXT BOOKS**

Davies, Juanita. Essentials of Medical Terminology. 3rdedition.NewYork.Delmar. 2008

Mogli. J..D..Medical Records: Organisation & Management 2ndeditionNewDelhiJaypee Brothers.

The body by Bilbirson Agreed for Occupance

**ETHICS**

**UNIT-I** **(3hrs)**

Introduction to Public Health Ethics.

Theories of Justice and Distribution of Public Health Resources. Principle for Public Health Ethics.

**UNIT-II** **(3hrs)**

Priority-Setting and Resource Allocation at the Macro Level.
Priority-Setting and Resource Allocation at the Micro Level.

**UNIT-III** **(3hrs)**

Medical Ethics and Medical Terminology.

1) Role Definition and Interaction: Ethical, Moral, and Legal Responsibilities

2) Medical Terminology

3) Medical Waste Management

**UNIT-IV** **(3hrs)**

Contemporary Ethical and Legal Issues in Health Care: Legal regulation of a standalone diagnostic centre, medico-legal cases and medical negligence, ethical aspects of healthcare.

Balancing Individual and Community Interests.
Ethics and Health Promotion.

**UNIT-V** **(3hrs)**

Role of Human Rights in Public Health

Ethics of Breast Promotion and Disease Prevention

**RECOMMENDED TEXT BOOKS**

1. EthicsandPublicHealthArchanaRaniSahoo&PatitapahanDas-2017

2. Public Health, Ethics, and Equity-Sudhir Anand, Fabienne Peter, and Amartya Sen-2006

3. Nursingandhealthcareethics-Robinson&Doody-6edition-2022

4. Ethics-William K.Frankena2edition-2015

## 5.EMERGENCY CRITICAL CONCEPTS AND MANAGEMENTS (PRACTICAL)

**L/T/P/C**
**-/-/5/5**

**Learning Objectives:**

- To provide hands-on training in emergency procedures.
- To develop clinical skills in managing critical patients.
- To enhance teamwork and communication in emergencies.
- To simulate real-life emergency scenarios.

**Learning Outcomes:**

- Perform basic and advanced emergency procedures.
- Demonstrate competence in patient assessment and management.
- Work effectively as part of an emergency care team.
- Respond efficiently in simulated emergency situations**.**

**(75hrs)**

**UNIT-I** **(15hrs)**

1. Scoring system GCS – how will you assess the GCS of the patient, check the pupillary Reaction
2. AVPU scale
3. Basic monitoring – Blood Pressure, Heart Rate, Spo2, ETco2, Temperature, urine Output

**UNIT-II** **(15hrs)**

1. Assessment for brain death
2. Apnoea Test
3. ABG
4. Ventilator Settings
5. Ventilators Graphics
6. HFNO

**UNIT-III** **(15hrs)**

Airway Equipment and Procedure
-Bag mask ventilation
-oropharyngeal airway, nasopharyngeal airway, AMBU bag,
-ET tube Portex adult
-laryngoscope and blades
-Magill's forceps, guedel airway, stylet, bougie, Ryle's tube, nasal prongs, O2 mask, suction Catheter
-Intubation/Extubation procedure

1. Transducer setup
2. Warmers
3. Hot line Warmers
4. Defibrillator
5. Syringe pump

**UNIT-IV** **(15hrs)**

CVS drugs, Adrenaline, atropine, dopamine, dobutamine, nor-adrenaline, vasopressin, isoprenaline,

Phenylephrine
71 B.Sc.- Critical Care Technology

**UNIT-V** **(15hrs)**

1. Procedure- lumbar puncture needle
2. CNS drugs- midazolam, lorazepam, diazepam, thiopentone, etomidate, Propofol, Ketamine
3. Musculo-skeletal drugs: Succinylcholine, Atracurium, vecuronium

**RECOMMENDED TEXT BOOKS**

1. The ICU book. Paul L Marino. 4th edition. Lippincott Williams & Wilkins
2. Current critical care. Diagnosis &treatment. Lange. 3rd edition.Mc-GrawHill Publishers
3. Davidson's Principles and Practice of Medicine, 22nd Edition. Churchill Livinston 2014
4. Airway Management by Rashid Khan. Paras Publishers.
5. Airway Management in the Critically Ill. Orway

## 6.SOFT SKILLS DEVELOPMENT

**L/T/P/C**

**2/-/-/2**

**Learning Objectives:**

- To enhance communication and interpersonal skills.
- To develop leadership and teamwork abilities.
- To improve problem-solving and decision-making skills.
- To build professional behavior and confidence.

**Learning Outcomes:**

- Communicate effectively in professional settings.
- Demonstrate teamwork and leadership qualities.
- Apply critical thinking in problem-solving.
- Exhibit professionalism and ethical behavior.

**(15hrs)**

**Week 1** **(2hrs)**

Introduction to Soft Skills: Definition of Soft Skills. Hard skills: The importance of soft skills in the workplace

Key soft skills: communication, teamwork, adaptability, problem-solving, leadership, etc.

Activities: Icebreakers, group discussions on soft skills in the workplace. Assignment: Self-assessment on current soft skills

**Week 2** **(2hrs)**

Communication Skills

The communication process: sender, message, receiver, feedback, active listening techniques

Body language and non-verbal cues. Effective speaking: tone, clarity, and pacing. Email and phone communication etiquette

Activities: Role-playing scenarios (e.g., client interaction, conflicted solution)

Assignment: Practice active listening and send an email incorporating effective communication principles.

**Week3** **(2hrs)**

Emotional Intelligence (EQ): What is emotional intelligence? (Self-awareness, self-Regulation, motivation, empathy, and social skills) Recognizing and managing your emotions, Understanding others' emotions and building empathy, Developing emotional resilience

Activities: Emotional intelligence quizzes, group discussion on handling emotional stressful situations

Assignment**:** Journaling emotional responses and reflection on EQ practices.

**Week4** **(1hrs)**

Teamwork and Collaboration Roles and dynamics within teams Effective communication in teams Conflict resolution in teams

Building trust and fostering a collaborative environment. Activities: Team exercises, problem-solving tasks, and brainstorming sessions Assignment: Work on a team project or task, and present in class.

**Week5** **(2hrs)**

Conflict Resolution Sources of conflict (miscommunication, differing priorities, etc.)

Conflict resolution strategies (e.g negotiation, mediation, compromise). The role of active listening in resolving conflicts

Managing personal emotions during conflict. Activities: Case studies, role-playing conflict resolution scenarios
Assignment: Reflect on a personal or professional conflict and propose a resolution strategy.

**Week 6** **(2hrs)**

Time Management and Personal Organization

The importance of time management in personal and professional success. Prioritization techniques (e.g., Eisenhower Matrix, ABCDE method)

Tools for time management (digital calendars, to-do lists, Pomodoro technique), setting SMART goals

Managing procrastination and avoiding distractions.
Activities: Time-blocking exercises, goal-setting workshop
Assignment: Create a personal time management plan and track daily productivity for a week.

**Week 7** **(2hrs)**

Leadership and Influence
Types of leadership (e.g., transformational, transactional, servant leadership)Leadingbyexample: qualities of effective leaders

Building and maintaining team morale. The art of persuasion and influence. Activities: Leadership style assessment, group discussions on leadership challenges. Assignment: Write a reflection on a leader you admire and why.

**Week8** **(2hrs)**

Public Speaking and Presentation Skills:
Overcoming Fear of Public Speaking
Structuring a presentation (opening, body, and conclusion), Effective use of visual aids (PowerPoint, etc.)

Engaging the audience through storytelling, eye contact, and body language Activities: Group presentations, peer feedback sessions, impromptu speaking exercises Assignment: Prepare and deliver a short presentation (5-7minutes) on a topic of choice. Assessment and Evaluation:

**Class Participation: 20 Assignments:30 Final: 50**

**RECOMMENDED TEXT BOOKS**

The7HabitsofHighlyEffectivePeople" by
Stephen R.Covey

**SEMESTER IV**

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARK | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Toxicological And Environmental Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Principles Of Trauma Care | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Disaster Management and Industrial Emergencies | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Principle Of Nursing | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Toxicological And Environmental Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 6 | | Principles of Trauma Care Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 7 | | Health and Well-being | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **18** | **-** | **6** | **24** | **280** | **420** | **700** |

## 1.TOXICOLOGY AND ENVIRONMENTAL EMERGENCY`

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand the principles of toxicology and environmental hazards.
- To identify sources and types of poisoning and environmental emergencies.
- To learn management protocols for toxic exposure and environmental injuries.
- To develop skills in risk assessment and prevention.

**Learning Outcomes:**

- Identify common toxic agents and environmental hazards.
- Explain the clinical features of poisoning and environmental exposure.
- Apply appropriate management and first aid measures.
- Demonstrate preventive strategies in toxicological emergencies

**(60hrs)**

### UNIT I **(15hrs)**

1. Infection control in the ICU
2. Common commensals and parasites encountered
3. Commonly used antiseptic agents
4. WHO Recommendations for Hand Hygiene
5. Protective barriers- Mask, Gloves, personal protective equipment

PPE

6. Nosocomial infections, Precautions for preventing airborne
Infections spread
7. Blood-borne pathogens capable of cross-transmission
8. Needle stick injury
9. Post-exposure management of HIV, HBSAG and HCV

**UNIT II** **(15hrs)**

Antimicrobial Stewardship
: a) Definition and three types of antibiotic Stewardship
, b) Why is antibiotic Stewardship important? Benefits and goals
c) The core element of antimicrobial Stewardship
d) Antibiogram? Antibiotics and antimicrobials
e) Misuse and overuse of antibiotics, Antimicrobial resistance

**UNIT III** **(15hrs)**

1. Sepsis – Definition
2. Septic shock
3. Presentation and Investigation patient in sepsis
4. Mortality indications SOFA/ Q SOFA
5. Goals of management in critically ill septic patients
6. IV fluids, albumin, electrolytes, inotropes, vasopressor, steroids,
Glycemic control, RRP, immunotherapy
7. Complications of sepsis – SIRS, ARDS, DIC, MODS
8. Surviving Sepsis Campaign Guidelines
9. Surviving Sepsis Campaign Bundles
10. B.Sc.- Critical Care Technology

**UNIT IV** **(15hrs)**

1. Classification of poisons - IV, Oral
2. Common poisoning encountered
3. Organophosphorus poison; Rat poison; oleander seed overdose
of drugs
4. Management of organophosphorus poison, symptomatic management
5. Opioids overdosing on the dosage of other drugs
V 1. Unknown bites and stings
2. Snake bite- neurotoxic and hemotoxic
3. Management of neurotoxic snake bite
4. Management of hemotoxic snake bite
5. Burns- care of the burns patient
6. Electrocution- immediate management of burn patient
7. Post-burn sequelae

**RECOMMENDED TEXT BOOKS**

1. The ICU book. Paul L Marino. 4th edition. Lippincott Williams & Wilkins
2. Current critical care. Diagnosis & treatment. Lange. 3rd edition. McGraw-Hill Publisher

## 2.PRINCIPLES OF TRAUMA CARE

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand the basics of trauma and injury mechanisms.
- To learn systematic assessment and management of trauma patients.
- To develop skills in primary and secondary survey.
- To familiarize with trauma care protocols and guidelines.

**Learning Outcomes:**

- Perform primary and secondary assessment of trauma patients.
- Identify life-threatening injuries promptly.
- Apply appropriate trauma management techniques.
- Demonstrate adherence to trauma care protocols.

**(60hrs)**

**UNIT I** **(12hrs)**

1) Type of trauma and classification, common emergency conditions Encountered
2) Blunt injury- Injury to the head, thorax and abdomen. Diagnosis, Investigations
3) Penetrating injury- Head injury, Thoracic injury, Abdomen injury, Bony Injury diagnosis and investigations.
4) Thermal injury- a) Fire accident b) Electrical burns
Drowning, Hanging
Anaphylaxis
Shock

**UNIT II** **(12hrs)**

1) Pre-hospital care of trauma victims: Assessment of consciousness, Airway, breathing and circulation.
2) Transport of the patient from the site of the accident to the tertiary hospital.
3) Triage: Different color coding bands, Categorization of the patients.
4) Golden hour: Definition, Time management and its importance.
5) Care of an Unconscious patient in trauma

**UNIT III** **(12hrs)**

1) ATLS (Acute trauma life support)- Introduction
2) Primary survey- Assessment of Airway, Breathing and Circulation.
3) Primary survey (continuation) - Assessment of Deformity and Exposure.
4) Secondary survey- Manual inline stabilization of the head, Application of Cervical collar, Log rolling technique, Application of pelvic binders
5) Application of tourniquets at bleeding sites, stabilization of long bones Fractures with splints, and Establishment of Intravenous access

**UNIT IV** **(12hrs)**

1) Urgent interventions in acute trauma care- Introduction
2) Blood investigations including hemoglobin, blood grouping, typing and Cross-matching, serology. Other blood investigations include RFT, Serum electrolytes, LFT.
3) Chest X-ray, patient positioning, X-ray of suspected long bone Fractures.
4) FAST scan – Four-quadrant abdominal scan, lung scan, Emergency Bedside transthoracic ECHO, ECG.
5) CT Scan- Shifting, positioning.

**UNIT V** **(12hrs)**

1) Common emergency procedures: ICD Insertion- Site, positioning, Preparation, Equipment.
2) Tracheostomy- Indications, Technique, Positioning, Requirements
3) Stomach wash- Indications, Techniques and drugs used.
4) SPC Insertion- Indications and Techniques.
5) Medico-legal issues, certification of death.

**RECOMMENDED TEXT BOOKS**

1. Bailey & Love's Short Practice of Surgery
2. ATLS, Advanced Trauma Life Support for Doctors

## 3. DISASTER MANAGEMENT AND INDUSTRIAL EMERGENCIES

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand types and phases of disasters.
- To learn disaster preparedness and response strategies.
- To develop knowledge of industrial hazards and safety measures.
- To enhance coordination and management skills during disasters.

**Learning Outcomes:**

- Classify different types of disasters and industrial emergencies.
- Apply disaster management principles in real-life scenarios.
- Demonstrate knowledge of safety protocols in industrial settings.
- Participate effectively in disaster response and coordination.

**(60hrs)**

### UNIT I (12hrs)

**Introduction to Disaster Management**

1. Definition, concept, and classification of disasters
2. Difference between hazard, disaster, risk, and vulnerability
3. Causes and effects of disasters (natural and man-made)
4. Disaster management cycle – mitigation, preparedness, response, recovery
5. Phases and components of disaster management
6. Principles and scope of disaster management
7. Legal and ethical aspects in disaster response
8. National Disaster Management Authority (NDMA) and its functions
9. International disaster management agencies (UNDRR, WHO, IFRC)
10. Role of healthcare professionals in disaster management

### UNIT II (12hrs)

**Natural Disasters and Their Management**

1. Earthquakes – causes, warning signs, and emergency response
2. Floods and cyclones – preparedness and rescue operations
3. Tsunamis – early warning systems and evacuation procedures
4. Landslides and avalanches – causes and management strategies
5. Droughts and famine – assessment and relief operations
6. Forest fires – control, prevention, and rescue measures
7. Heatwaves and cold waves – health impacts and precautions
8. Volcanic eruptions – hazard control and community safety
9. Epidemics and pandemics – public health response and surveillance
10. Role of meteorological and geophysical departments in early warning

## UNIT III (12hrs)

**Industrial and Technological Emergencies**

1. Definition, types, and causes of industrial disasters
2. Major industrial hazards: chemical, thermal, mechanical, electrical
3. Toxic gas leaks (e.g., Bhopal Gas Tragedy) – lessons learned
4. Radiation accidents – safety measures and decontamination
5. Explosion hazards – causes and preventive measures
6. Fire safety and management in industrial settings
7. Industrial waste and pollution control
8. Occupational health and safety standards (OSHA, Factory Act)
9. Emergency preparedness plans in industries (on-site and off-site)
10. Role of first responders and EMS in industrial emergencies

## UNIT IV (12hrs)

**Disaster Preparedness and Response Systems**

1. Disaster risk assessment and vulnerability mapping
2. Early warning and communication systems
3. Search and rescue operations – methods and coordination
4. Incident Command System (ICS) – structure and roles
5. Triage and mass casualty management
6. Emergency medical response teams and their organisation
7. Logistics management in disaster response
8. Shelter management and relief distribution
9. Psychosocial support and counselling during disasters
10. Coordination between the government, NGOs, and the community in disasters

## UNIT V (12hrs)

**Rehabilitation, Recovery, and Emerging Trends**

1. Post-disaster rehabilitation and reconstruction
2. Damage assessment and documentation
3. Role of media and information technology in disaster management
4. Public health measures during the recovery phase
5. Community-based disaster risk reduction (CBDRR)
6. Role of education and training in disaster preparedness
7. Environmental sustainability and disaster risk reduction
8. Use of GIS and remote sensing in disaster management
9. Smart technologies, drones, and AI in emergency response
10. National and international case studies on disaster and industrial emergencies

**RECOMMENDED TEXT BOOKS**

1. Disaster Management – **Gupta A.K. & G.S. Dhillon**
2. Disaster Management in India: Policies, Institutions and Practices – **Ministry of Home Affairs, Govt. of India**
3. Introduction to International Disaster Management – **Damon P. Coppola**
4. Industrial Safety and Disaster Management – **R.K. Jain & Sunil S. Rao**
5. Emergency Planning and Industrial Safety – **S.C. Dhara**
6. NDMA Guidelines – **National Disaster Management Authority (India)**

## 4.PRINCIPLE OF NURSING

**L/T/P/C**
**4/-/-/4**

**Learning Objectives:**

- To understand basic nursing principles and patient care.
- To develop skills in hygiene, comfort, and patient safety.
- To learn vital signs monitoring and basic procedures.
- To promote compassionate and ethical patient care.

**Learning Outcomes:**

- Demonstrate basic nursing care techniques.
- Monitor and record vital signs accurately.
- Maintain hygiene and patient comfort effectively.
- Exhibit empathy and professionalism in patient care.

**(60hrs)**

### UNIT I (12hrs)

**Introduction to Nursing**

1. Definition, concept, and scope of nursing
2. History and development of nursing (Florence Nightingale and modern nursing)
3. Philosophy, ethics, and values in nursing practice
4. Health and illness – concepts and factors influencing health
5. Roles and responsibilities of a professional nurse
6. Code of ethics and professional conduct (INC and ICN)
7. Nursing as a profession – characteristics and functions
8. Health care delivery system – levels and team members
9. Communication skills and nurse-patient relationship
10. Legal aspects in nursing practice

### UNIT II (12hrs)

**Nursing Theories and the Nursing Process**

1. Overview and importance of nursing theories
2. Major nursing theorists – Nightingale, Orem, Roy, Peplau, Henderson
3. Components and application of the nursing process
4. Assessment – data collection and validation
5. Nursing diagnosis – concept and formulation
6. Planning – establishing priorities and setting goals
7. Implementation – nursing interventions and documentation
8. Evaluation – outcome measurement and modification
9. Critical thinking and clinical judgment in nursing
10. Evidence-based nursing practice

## UNIT III (12hrs)

**Basic Nursing Procedures and Skills**

1. Principles of asepsis, infection control, and standard precautions
2. Hand hygiene, disinfection, and sterilization techniques
3. Admission, transfer, and discharge of patients
4. Bed making – occupied and unoccupied
5. Positioning and comfort measures for patients
6. Vital signs – temperature, pulse, respiration, blood pressure
7. Oxygen therapy and nebulization
8. Elimination needs – bedpan, urinal, enemas, and catheter care
9. Feeding techniques – oral, nasogastric, and enteral feeding
10. Specimen collection (urine, stool, sputum, blood)

## UNIT IV (12hrs)

**Patient Care and Safety Management**

1. Principles of patient safety and risk prevention
2. Infection prevention and biomedical waste management
3. Care of patients with fever, pain, and immobility
4. Pressure sore prevention and care
5. Preoperative and postoperative nursing care
6. Care of terminally ill and dying patients
7. Body mechanics and patient lifting techniques
8. Hot and cold applications – purpose and procedure
9. Patient hygiene – bathing, oral care, hair and nail care
10. Recording and reporting in nursing practice

## UNIT V (12hrs)

**Professional Growth and Health Education**

1. Leadership and teamwork in nursing
2. Time management and stress management for nurses
3. Continuing education and professional development
4. Role of nurse in health promotion and disease prevention
5. Patient education – principles and methods
6. Community health nursing – concept and importance
7. Ethics in patient care and confidentiality
8. Legal responsibilities and accountability in nursing
9. Documentation and record maintenance standards
10. Role of nurse in research and quality assurance

**RECOMMENDED TEXT BOOKS**

1. Potter & Perry's Fundamentals of Nursing – **Potter, Perry, Stockert & Hall**
2. Fundamentals of Nursing – **Kozier, Erb, Berman & Snyder**
3. Textbook of Nursing Foundation – **B.T. Basavanthappa**
4. Foundations of Nursing Practice – **Rosdahl & Kowalski**
5. Clinical Nursing Procedures – **Taylor & Lillis**
6. Indian Nursing Council (INC) Guidelines and Code of Ethics

## 5.TOXICOLOGICAL AND ENVIRONMENTAL EMERGENCY (PRACTICAL)

**L/T/P/C**
**-/-/3/3**

**Learning Objectives:**

- To provide hands-on training in managing toxicological emergencies.
- To develop skills in handling poisoning and exposure cases.
- To practice emergency response techniques.
- To enhance safety and precautionary measures.

**Learning Outcomes:**

- Perform first aid and emergency management in poisoning cases.
- Demonstrate proper use of protective equipment.
- Respond effectively to environmental emergency scenarios.
- Apply safety protocols during practical situations.

**(30hrs)**

**UNIT I** **(6hrs)**

1. HME filter
2. Humidifier
3. LMA
4. IV set
5. Blood transfusion set
6. Tracheostomy tube
7. Urobag

**UNIT II** **(6hrs)**

1. Difficult intubation cart
2. Breathing circuit
3. Oxygen cylinders, O2 mask Reservoir bag
4. Flow meters, venture mask, HFNO circuit and machine

**UNIT III** **(6hrs)**

1. Invasive monitors – IBP, CVP, ICP, PCWP, core temperature
2. Non-Invasive Cardiac output monitor

**UNIT IV** **(6hrs)**

1. Hydrocortisone, Dexamethasone, Fentanyl, Morphine, Pethidine, Tramadol, Oxytocin, Methergin, Carboprost, Tranexamic acid

**UNIT V** **(6hrs)**

IV fluids

1. Crystalloids NS, RL, Mannitol, DNS, Plasmalyte
2. Colloids: Natural plasma albumin
3. Dextran-40%, 60% , 70%, HES Gelatin
4. Special fluids- 3% NaCl, KCl, CaCl2, NaHCO3

**RECOMMENDED TEXT BOOKS**

1. The ICU book. Paul L Marino. 4th edition. Lippincott Williams & Wilkins
2. Current critical care. Diagnosis & treatment. Lange. 3rd edition. Mc-Graw Hill Publishers
3. Morgan & Mikhail's Clinical Anesthesiology

## 6.PRINCIPLES OF TRAUMA CARE (PRACTICAL)

**L/T/P/C**
**-/-/3/3**

**Learning Objectives:**

- To develop hands-on skills in trauma patient management.
- To practice immobilization and emergency procedures.
- To enhance teamwork in trauma care settings.
- To simulate real-life trauma scenarios.

**Learning Outcomes:**

- Perform immobilization and basic trauma procedures.
- Demonstrate effective patient handling techniques.
- Work efficiently as part of a trauma care team.
- Respond appropriately in simulated trauma situations.

**(30hrs)**

**UNIT-I** **(6hrs)**

1. Lumbar puncture
2. Thoracentesis
3. Paracentesis
4. Stomach Wash / Enema procedure

**UNIT-II** **(6hrs)**

1. Blood and blood components
2. ABG analysis
3. How to collect arterial sample and retrieve result from ABG machine
4. TEG, ROTEM, Sonoclot analysis
5. How to collect sample for blood culture, urine culture and tracheal culture

**UNIT-III** **(6hrs)**

1. Handling Infective patient
2. Universal safety precaution
3. Sedation for MRI / CT
4. Assisting in endoscopy procedure

**UNIT-IV** **(6hrs)**

1. ICU care
2. Post-surgical safety checklist
3. Aldrete score
4. Pain scale

**UNIT-V** **(6hrs)**

1. Hemodialysis
2. Infusion pump settings
3. Zeroing and levelling

**RECOMMENDED TEXT BOOKS**

1. The ICU book. Paul L Marino. 4th edition. Lippincott Williams & Wilkins

## 7.HEALTH AND WELL-BEING

**L/T/P/C**

**2/-/-/2**

**Course Description:**

This course explores the holistic approach to health and well-being, focusing on physical, mental, and social aspects. Students will learn about health promotion strategies, the importance of physical activity, nutrition, mental health awareness, and stress management. The course also addresses the impact of lifestyle choices and societal factors on overall health**.**

**Learning Objectives:**

- To understand concepts of physical, mental, and social health.
- To promote healthy lifestyle practices.
- To develop stress management and coping strategies.
- To create awareness about preventive healthcare.

**Learning Outcomes:**

- Explain components of health and well-being.
- Adopt healthy lifestyle and preventive practices.
- Demonstrate stress management techniques.
- Promote health awareness in the community.

**(15hrs)**

**UNIT I** **(1hrs)**

Introduction to Health and Well-being: Overview
of Health and Well-being Concepts
Dimensions of health: Physical, mental, social, and emotional. The impact of lifestyle choices on health

**UNIT II** **(1hrs)**

Physical Health and Fitness: Importance of physical activity for overall health
Types of exercise: Aerobic, strength, flexibility, and balance creating a personal fitness plan

**UNIT III** **(1hrs)**

Nutrition and Healthy Eating

Basics of nutrition: Macronutrients and micronutrients. Healthy eating habits and food groups. Impact of nutrition on physical and mental health.

**UNIT IV** **(1hrs)**

Mental Health and Emotional Well-being
Understanding mental health: Definitions, stigma, and myths
Key aspects of emotional well-being
Building emotional resilience

**UNIT V** (**1hrs)**

**Stress Management Techniques**

Understanding stress and its effects on health
Mindfulness and relaxation techniques
Time management for stress reduction

**UNIT VI** (**2hrs)**

**Sleep and Recovery**

Importance of sleep for physical and mental health
Sleep hygiene and healthy sleep habits
Impact of sleep deprivation on overall well-being

**UNIT VII** **(2hrs)**

**Social Health and Relationships**

The role of social connections in well-being
Healthy relationships: Communication, boundaries, and support
Community involvement and social well-being

**UNIT VIII** (**2hrs)**

**Substance Use and Addiction**

The impact of alcohol, tobacco, and drugs on health
Understanding addiction and treatment options
Preventive measures and harm reduction strategies

**UNIT IX** (**2hrs)**

**Chronic Diseases and Prevention**

Common chronic diseases (e.g., diabetes, heart disease)
Risk factors and lifestyle modifications for prevention
Screening, early detection, and health monitoring

**UNIT X** (**2hrs)**

**Building Healthy Habits**

The psychology of habit formation
Strategies for adopting and maintaining healthy habits
Overcoming barriers to healthy behaviour changes

**Reference Textbook**

Health and Wellness" by S. L. Kaskutas & K. A. A. Nielson

## SEMESTER V

| S.NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARK | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Surgical Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Pediatrics | 4 | - | - | 4 | 30 | 70 | 100 |
| 3 | | Obstetrical Emergency | 4 | - | - | 4 | 30 | 70 | 100 |
| 4 | | Surgical Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 5 | | Emergency Pediatric Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 6 | | Obstetrical Emergency Practical | - | - | 3 | 3 | 30 | 70 | 100 |
| 7 | | Interpersonal Communication | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **14** | **-** | **9** | **23** | **280** | **420** | **700** |

## 1.SURGICAL EMERGENCIES

**L/T/P/C**

**4/-/-/4**

**Learning Objectives:**

- To understand common surgical emergencies and their causes.
- To learn assessment and initial management of surgical conditions.
- To develop knowledge of pre-operative and post-operative care.
- To familiarize with emergency surgical interventions.

**Learning Outcomes:**

- Identify signs and symptoms of surgical emergencies.
- Perform initial assessment and stabilization of patients.
- Assist in pre-operative and post-operative management.
- Apply appropriate emergency surgical care principles.

**(60hrs)**

### UNIT I (12hrs)

**Introduction to Surgical Emergencies**

1. Definition, concept, and scope of surgical emergencies
2. Classification of surgical emergencies
3. General principles of surgical emergency care
4. Roles and responsibilities of the nurse and emergency team
5. Pre-hospital and hospital management of surgical patients

6. Triage and prioritization in surgical emergencies
7. Assessment of critically ill surgical patients (ABCDE approach)
8. Preparation for emergency surgery and operating room setup
9. Infection control and aseptic techniques in emergency surgery
10. Legal and ethical aspects of surgical emergency care

**UNIT II** (12**hrs)**

**Trauma and Musculoskeletal Emergencies**

1. Principles of trauma management – primary and secondary survey
2. Head and spinal injuries – assessment, immobilisation, and care
3. Chest trauma – pneumothorax, hem thorax, flail chest management
4. Abdominal trauma – blunt and penetrating injuries
5. Pelvic fractures and associated organ injuries
6. Fracture classification, first aid, and immobilisation techniques
7. Crush injuries and compartment syndrome
8. Haemorrhage control and fluid resuscitation in trauma
9. Soft tissue injuries, wound management, and suturing
10. Role of trauma teams and advanced trauma life support (ATLS) principles

**UNIT III** (12**hrs)**

**Abdominal and Gastrointestinal Emergencies**

1. Acute abdomen – causes and evaluation
2. Intestinal obstruction – diagnosis and management
3. Peritonitis and perforated viscus – emergency care and surgery
4. Acute appendicitis and its complications
5. Peptic ulcer perforation and bleeding
6. Hepatic and splenic rupture – emergency management
7. Gastrointestinal bleeding – upper and lower sources
8. Acute pancreatitis – causes, complications, and management
9. Hernia – strangulated and obstructed types
10. Preoperative and postoperative care in GI surgical emergencies

**UNIT IV** (12**hrs)**

**Urological, Vascular, and Special Surgical Emergencies**

1. Acute urinary retention and renal colic
2. Ureteric obstruction and hydronephrosis
3. Testicular torsion and scrotal emergencies
4. Bladder rupture and genitourinary trauma
5. Peripheral vascular injuries and ischemic limb
6. Deep vein thrombosis and embolic events
7. Arterial bleeding and limb salvage procedures
8. Breast abscess and other soft-tissue infections

9. Surgical infections and necrotizing fasciitis
10. Management of surgical shock and sepsis

**UNIT V** (12**hrs)**

**Burns, Wounds, and Postoperative Complications**

1. Burns – classification, assessment (Rule of 9s), and fluid therapy
2. Electrical and chemical burns – emergency management
3. Inhalational injuries and airway management
4. Wound healing and factors affecting it
5. Types of wounds – clean, contaminated, infected
6. Principles of wound dressing and suturing techniques
7. Postoperative complications – haemorrhage, infection, dehiscence
8. Thromboembolism and respiratory complications after surgery
9. Pain management and patient monitoring in postoperative period
10. Rehabilitation and psychological support of surgical patients

**RECOMMENDED TEXTBOOKS**

1. Bailey & Love's Short Practice of Surgery – **Norman S. Williams**
2. Surgical Emergencies – **Morris & Malt**
3. Essentials of General Surgery – **Lawrence W. Way**
4. Emergency Surgery Manual – **American College of Surgeons**
5. Textbook of Surgical Nursing – **B.T. Basavanthappa**
6. Advanced Trauma Life Support (ATLS) Guidelines – **American College of Surgeons**

## 2. EMERGENCY PEDIATRICS

**L/T/P/C**

**4/-/-/4**

**Learning Objectives:**

- To understand pediatric emergencies and their unique features.
- To learn assessment and management of critically ill children.
- To develop skills in pediatric resuscitation and care.
- To recognize growth-related and age-specific differences in emergencies.

**Learning Outcomes:**

- Identify common pediatric emergency conditions.
- Perform pediatric assessment and resuscitation techniques.
- Apply appropriate management strategies for children.
- Demonstrate child-specific care and communication skills.

**(60hrs)**

### UNIT I (12**hrs)**

**Introduction to Pediatric Emergency Care**

1. Definition, scope, and principles of paediatric emergency medicine
2. Differences between adult and paediatric emergencies
3. Paediatric anatomy and physiology relevant to emergencies
4. Paediatric assessment triangle (appearance, breathing, circulation)
5. Primary and secondary survey in children
6. Triage in paediatric emergency settings
7. Paediatric basic life support (PBLS) and advanced life support (PALS)
8. Role of emergency nurse and paediatric emergency team
9. Legal and ethical considerations in paediatric emergencies
10. Communication with parents and caregivers during emergencies

### UNIT II (12**hrs)**

**Respiratory and Cardiovascular Emergencies**

1. Recognition and management of respiratory distress and failure
2. Upper airway obstruction (croup, epiglottitis, foreign body aspiration)
3. Lower airway emergencies (asthma, bronchiolitis, pneumonia)
4. Apnoea in infants – causes and management
5. Acute respiratory distress syndrome (ARDS)
6. Shock in children – hypovolemic, cardiogenic, septic, and anaphylactic
7. Congenital heart disease presenting as emergencies
8. Cardiac arrhythmias and cardiac arrest management in children
9. Fluid and electrolyte balance in paediatric emergencies
10. Use of oxygen therapy and mechanical ventilation in paediatrics

**UNIT III** (12**hrs)**

**Neurological and Metabolic Emergencies**

1. Febrile seizures – causes, management, and prevention
2. Status epilepticus – emergency management and drugs
3. Head injury and increased intracranial pressure in children
4. Meningitis and encephalitis – recognition and treatment
5. Hypoglycaemia and diabetic ketoacidosis (DKA)
6. Electrolyte imbalance (hyponatremia, hyperkalaemia, dehydration)
7. Poisoning and envenomation in children
8. Metabolic disorders presenting as emergencies
9. Near-drowning and aspiration syndromes
10. Thermal emergencies – hypothermia and hyperthermia

**UNIT IV** (12**hrs)**

**Gastrointestinal, Renal, and Infectious Emergencies**

1. Acute gastroenteritis and dehydration management
2. Acute abdominal pain and appendicitis
3. Intestinal obstruction and intussusception
4. GI bleeding and perforation in children
5. Acute hepatitis and liver failure
6. Acute glomerulonephritis and nephrotic syndrome
7. Acute renal failure – causes and management
8. Urinary tract infections and urosepsis
9. Sepsis, SIRS, and septic shock in children
10. Immunization-related emergencies and allergic reactions

**UNIT V** (12**hrs)**

**Trauma, Toxicology, and Special Pediatric Situations**

1. Paediatric trauma – assessment and stabilization
2. Head, chest, and abdominal injuries in children
3. Burns and electrical injuries in paediatric patients
4. Fractures and musculoskeletal trauma
5. Child abuse and non-accidental injuries – identification and reporting
6. Drug overdose and common household poisoning
7. Paediatric obstetric and neonatal emergencies (birth asphyxia, sepsis)
8. Paediatric surgical emergencies (hernia, pyloric stenosis, volvulus)
9. Disaster preparedness and triage in paediatric settings
10. Psychosocial support for children and families in emergencies

**RECOMMENDED TEXTBOOKS**

1. **Textbook of Paediatric Emergency Medicine** – Fleisher & Ludwig
2. **Nelson Textbook of Paediatrics** – Kliegman, St. Geme, et al.
3. **Paediatric Advanced Life Support (PALS) Manual** – American Heart Association (AHA)
4. **Emergency Paediatrics: A Guide to Ambulatory Care** – Barkin R.M.
5. **Clinical Paediatric Nursing** – Wong, Hockenberry & Wilson
6. **Indian Academy of Paediatrics (IAP) Guidelines on Paediatric Emergencies**

## 3.OBSTETRIC EMERGENCIES

**L/T/P/C**

**4/-/-/4**

**Learning Objectives:**

- To understand common obstetric emergencies and complications.
- To learn emergency management of maternal and fetal conditions.
- To develop skills in antenatal and postnatal emergency care.
- To recognize high-risk pregnancy situations.

**Learning Outcomes:**

- Identify obstetric emergencies and risk factors.
- Apply appropriate management for maternal and fetal emergencies.
- Assist in emergency obstetric procedures.
- Demonstrate safe and timely decision-making in obstetric care.

**(60hrs)**

### UNIT I (12hrs)

**Introduction to Obstetric Emergencies**

- Definition and scope of obstetric emergencies
- Anatomy and physiology of female reproductive system
- Maternal and fetal physiology during pregnancy
- High-risk pregnancy overview
- Assessment and triage in obstetric emergencies

### UNIT II (12hrs)

**Hypertensive and Hemorrhagic Emergencies**

- **Hypertensive Disorders:**
  - Preeclampsia and eclampsia: causes, signs, management
  - HELLP syndrome
- **Haemorrhagic Disorders:**
  - Antepartum haemorrhage: placenta Previa, abruption placentae
  - Postpartum haemorrhage (PPH): causes, prevention, management
  - Retained placenta and uterine inversion

### UNIT III (12hrs)

**Obstetric Complications and Emergencies during Labor**

- Preterm labour and premature rupture of membranes (PROM)
- Prolonged and obstructed labour
- Shoulder dystocia and cord prolapse
- Uterine rupture and amniotic fluid embolism
- Emergency caesarean section – indications and nursing care

**UNIT IV** (12**hrs)**

**Obstetric Emergencies Related to Medical and Surgical Conditions**

- Cardiac disease in pregnancy
- Diabetes mellitus and gestational diabetes
- Anaemia and shock in pregnancy
- Sepsis and infection management
- Trauma in pregnancy (accident, violence, falls)

**UNIT V** (12**hrs)**

**Emergency Nursing Management and Ethical Considerations**

- Initial assessment and stabilization (ABCDE approach)
- Use of emergency drugs and equipment in obstetric care
- Neonatal resuscitation in emergency situations
- Documentation and communication in emergencies
- Legal, ethical, and emotional aspects of obstetric emergency care

**RECOMMENDED TEXT BOOKS**

1. **Williams Obstetrics**
F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom McGraw-Hill Education
2. **DC Dutta's Textbook of Obstetrics**
Hiralal Konar Jaypee Brothers Medical Publishers
3. **Textbook of Obstetric Emergencies**
Sanjay Gupte Jaypee Brothers Medical Publishers 2nd Edition, 2018

## 4.SURGICAL EMERGENCY – PRACTICAL

**L/T/P/C**

**-/-/3/3**

**Learning Objectives:**

- To provide hands-on training in managing surgical emergencies.
- To develop skills in patient assessment and stabilization.
- To practice sterile techniques and emergency procedures.
- To enhance teamwork in surgical settings.

**Learning Outcomes:**

- Perform basic procedures related to surgical emergencies.
- Demonstrate sterile techniques and patient safety measures.
- Assist effectively in emergency surgical interventions.
- Respond efficiently in simulated surgical scenarios.

**(45hrs)**

**UNIT I** **(9hrs)**

**Initial Assessment and Triage**

- Primary survey (ABCDE approach)
- Vital signs monitoring
- Pain assessment and documentation
- Wound inspection and classification

**UNIT II** **(9hrs)**

**Wound and Trauma Management**

- Dressing techniques (sterile and non-sterile)
- Suture and stapling assistance
- Burns and electrical injuries management
- Fracture immobilisation and splinting

**UNIT III** **(9hrs)**

**Emergency Procedures**

- Intravenous (IV) insertion and fluid administration
- Catheterisation (urinary)
- Nasogastric tube insertion
- Chest tube care

**UNIT IV** **(9hrs)**

**Shock and Hemorrhage Management**

- Management of hypovolemic and septic shock
- Haemorrhage control techniques
- Blood transfusion monitoring

- Use of emergency drugs

**UNIT V** **(9hrs)**

**Use of Emergency Equipment**

- Defibrillator and AED usage
- Oxygen therapy and suctioning
- Monitoring equipment (BP, SpO2, ECG)
- Documentation of procedures

**RECOMMENDED TEXT BOOKS**


1. ATLS: Advanced Trauma Life Support – Student Course Manual**, American College of Surgeons,** 11th Edition (2023)
2. Manual of Emergency and Critical Care Procedures**, Demetrios Demetriades & Kenji Inaba,** 2nd Edition (2018)
3. Tintinalli's Emergency Medicine: A Comprehensive Study Guide**, Judith E. Tintinalli et al.,** 9th Edition (2020)
4. Oxford Handbook of Emergency Medicine**, Jonathan P. Wyatt, Robin N. Illingworth et al.,** 5th Edition (2020)
5. Emergency Nursing Procedures**, Jean Proehl,** 5th Edition (2017)

## 5.EMERGENCY PEDIATRIC – PRACTICAL

**L/T/P/C**

**-/-/3/3**

**Learning Objectives:**

- To develop practical skills in pediatric emergency care.
- To practice pediatric resuscitation and monitoring.
- To enhance communication with children and caregivers.
- To simulate real-life pediatric emergency situations.

**Learning Outcomes:**

- Perform pediatric emergency procedures and resuscitation.
- Monitor and assess pediatric patients effectively.
- Communicate appropriately with children and families.
- Demonstrate confidence in handling pediatric emergencies.

**(30hrs)**

**UNIT I** **(6hrs)**

**Pediatric Assessment**

- Paediatric Assessment Triangle (PAT)
- Growth parameters and vital signs in children
- Pain assessment in children
- Identification of emergency signs

**UNIT II** **(6hrs)**

**Respiratory Emergencies**

- Oxygen therapy and nebulization
- Airway management (bag-mask ventilation)
- Recognition and management of respiratory distress
- Paediatric intubation assistance

**UNIT III** **(6hrs)**

**Seizures and Shock Management**

- Febrile seizure management
- Hypovolemic and septic shock in children
- IV/IO fluid administration
- Emergency drug administration

**UNIT IV** **(6hrs)**

**Pediatric Trauma and Burns**

- Wound care and dressing in children
- Fracture immobilisation
- Burn management

- Poisoning and drug overdose first aid

**UNIT V** **(6hrs)**

**Neonatal and Critical Care**

- Neonatal resuscitation (NRP)
- Monitoring vital signs and oxygenation in neonates
- Care for critically ill infants
- Documentation and reporting in paediatric emergencies

**RECOMMENDED TEXTBOOKS**

1. Textbook of Paediatric Emergency Medicine, Gary R. Fleisher & Stephen Ludwig, 8th Edition (2019)
2. Paediatric Emergency Medicine, Marianne Gausche-Hill, Susan M. Gutgesell & Lorna M. Browne,
3. Advanced Paediatric Life Support: A Practical Approach to Emergencies, Advanced Life Support Group (ALSG), 7th Edition (2020)
4. Clinical Manual of Emergency Paediatrics, Ellen F. Crain & Jeffrey C. Gershel, 6th Edition (2018)

## 6.OBSTETRICAL EMERGENCY – PRACTICAL

**L/T/P/C**

**-/-/3/3**

**Learning Objectives:**

- To provide hands-on experience in obstetric emergency care.
- To develop skills in maternal and fetal monitoring.
- To practice emergency procedures in obstetrics.
- To enhance decision-making and teamwork.

**Learning Outcomes:**

- Assist in managing obstetric emergencies effectively.
- Monitor maternal and fetal conditions accurately.
- Perform basic obstetric emergency procedures.
- Work efficiently within a multidisciplinary team.

**(30hrs)**

**UNIT I** **(6hrs)**

**Maternal Assessment**

- Initial assessment of pregnant women in the emergency
- Vital signs monitoring and fetal assessment
- History taking and identification of high-risk pregnancy

**UNIT II** **(6hrs)**

**Hypertensive Disorders and Haemorrhage Management**

- Blood pressure monitoring and proteinuria testing
- Management of eclampsia and preeclampsia
- Postpartum haemorrhage management (uterine massage, medications)
- IV fluid and blood transfusion

**UNIT III** **(6hrs)**

**Labour and Delivery Emergencies**

- Monitoring labour progress
- Management of shoulder dystocia and cord prolapse
- Emergency caesarean assistance
- Handling preterm labour

**UNIT IV** **(6hrs)**

**Obstetric Procedures**

- Episiotomy and perineal care
- Catheterisation and bladder care
- Vaginal examination and fetal monitoring

- Neonatal resuscitation

**UNIT V** **(6hrs)**

**Emergency Drugs and Documentation**

- Administration of obstetric emergency drugs (oxytocin, magnesium sulphate)
- Use of emergency equipment in obstetric care
- Legal and ethical considerations
- Documentation and communication in emergencies

**RECOMMENDED TEXT BOOKS**

1. Williams Obstetrics, F. Gary Cunningham, Kenneth J. Leveno & Steven L. Bloom, 27th Edition (2022)
2. DC Dutta's Textbook of Obstetrics, Hiralal Konar, 10th Edition (2023)
3. Textbook of Obstetric Emergencies, Sanjay Gupte, 2nd Edition (2018)
4. Myles Textbook for Midwives, Jayne E. Marshall & Maureen D. Raynor, 17th Edition (2020)
5. Varney's Midwifery, Tekoa L. King & Mary C. Brucker, 6th Edition (2018)

## 7.INTERPERSONAL COMMUNICATION

**L/T/P/C**

**2/-/-/2**

**Learning Objectives:**

- To develop effective verbal and non-verbal communication skills.
- To enhance patient interaction and counseling abilities.
- To improve teamwork and professional relationships.
- To manage conflicts and emotional situations in healthcare settings.

**Learning Outcomes:**

- Communicate clearly and effectively with patients and colleagues.
- Demonstrate active listening and empathy.
- Handle difficult conversations and conflicts professionally.
- Exhibit strong interpersonal and teamwork skills.

**(15hrs)**

### UNIT I (1hrs)

- Introduction to Interpersonal Communication
- Overview of interpersonal communication theory.
- Key principles: sender, message, receiver, feedback, noise .Importance of communication in daily life.

### UNIT II (1hrs)

- Verbal Communication
- The role of language in communication.
- Choosing words carefully: Clarity, precision, and ambiguity. Influence of culture and context on verbal communication.

### UNIT III (1hrs)

- Non-Verbal Communication
- Body language, facial expressions, and gestures. Space, posture, and touch in communication.
- The role of non-verbal cues in conveying emotions

### UNIT IV (1hrs)

- Listening Skills
- Types of listening: Active, passive, reflective. Barriers to effective listening.
- Developing empathy through listening.

### UNIT V (1hrs)

- Self-Disclosure and Relationship Development: The importance of self-disclosure in relationships. The Johari Window model.
- How self-disclosure affects trust and intimacy.

**UNIT VI** **(2hrs)**

- Conflict in Interpersonal Communication Types of conflict: Productivevs. destructive. Conflict management styles.
- Strategies for resolving conflict in healthy ways.

**UNIT VII** **(2hrs)**

- Cultural and Gender Differences in Communication
- Cultural influences on communication styles .Gender communication differences.
- Strategies for effective cross-cultural communication.

**UNIT VIII** **(2hrs)**

- Communication in Close Relationships
- Communication patterns in romantic relationships, family, and friendships.
- Managing expectations and maintaining healthy communication in intimate relationships.

**UNIT IX** **(2hrs)**

- Communication in the Workplace
- Interpersonal communication in professional settings.
- Navigating professional relationships and maintaining boundaries. Communication and leadership.

**UNIT X** **(2hrs)**

- Digital Communication
- The role of technology in interpersonal communication. The impact of social media on relationships.
- Pros and cons of digital communication tools.
- The Ethics of Communication
- Ethical dilemma in communication.
- Honesty, transparency, and privacy in conversations. Balancing openness with respect for others' boundaries.

**RECOMMENDED TEXT BOOKS**

*"Interpersonal Communication: Everyday Encounters"*(Author:JuliaT.Wood,9thEdition

**SEMESTER VI**

| S. NO | SUBJECT CODE | SUBJECT | L | T | P | C | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | INT | EXT | |
| 1 | | Critical Care Medicine | 4 | - | - | 4 | 30 | 70 | 100 |
| 2 | | Emergency Orthopedics | 4 | - | 2 | 6 | 30 | 70 | 100 |
| 3 | | Research Methodology & Biostatistics | 3 | - | - | 3 | 30 | 70 | 100 |
| 4 | | Hospital and Emergency Room Management | 4 | - | - | 4 | 30 | 70 | 100 |
| 5 | | Practical Skill Applications in Emergency Medical Services | 2 | - | 2 | 4 | 30 | 70 | 100 |
| 6 | | Critical Care Medicine Practical | - | - | 2 | 2 | 30 | 70 | 100 |
| 7 | | Art of Being a Better Person | 2 | - | - | 2 | 100 | - | 100 |
| | | **TOTAL** | **19** | **-** | **6** | **25** | **280** | **420** | **700** |

## 1.CRITICAL CARE MEDICINE

**L/T/P/C**

**4/-/-/4**

### Learning Objectives:

- To understand principles of intensive care and critical illness.
- To learn management of patients with life-threatening conditions.
- To develop skills in monitoring and life-support systems.
- To familiarize with ICU protocols and multidisciplinary care.

### Learning Outcomes:

- Explain the principles of critical care management.
- Identify and manage critically ill patients effectively.
- Interpret clinical and monitoring data in ICU settings.
- Apply life-support techniques and critical care protocols.

**(60hrs)**

**UNIT I** **(12hrs)**

**Introduction to Critical Care**

1. Definition and scope of critical care medicine
2. Organisation of the ICU and types of ICUs
3. Roles of the critical care team
4. ICU admission criteria
5. ABCDE approach in critically ill patients

6. Critical care triage
7. Monitoring parameters in the ICU
8. Patient safety and infection control
9. Ethical considerations in critical care
10. Documentation and communication in the ICU

**UNIT II** (12**hrs)**

**Respiratory Critical Care**

1. Physiology of respiration and oxygen transport
2. Recognition of respiratory failure
3. Non-invasive ventilation (CPAP/BiPAP)
4. Mechanical ventilation principles
5. Ventilator settings and monitoring
6. Management of ARDS
7. Weaning from mechanical ventilation
8. Suctioning and airway clearance techniques
9. Oxygen therapy delivery systems
10. Complications of respiratory support

**UNIT III** (12**hrs)**

**Cardiovascular Critical Care**

1. Hemodynamic monitoring (invasive and non-invasive)
2. Shock types and management
3. Fluid resuscitation and balance
4. Use of vasopressors and inotropes
5. ECG interpretation in critically ill patients
6. Cardiac arrhythmia management
7. Post-cardiac arrest care
8. Acute coronary syndrome in the ICU
9. Cardiogenic shock management
10. Cardiopulmonary resuscitation in the ICU

**UNIT IV** (12**hrs)**

**Renal, Metabolic, and Infectious Critical Care**

1. Acute kidney injury and renal replacement therapy
2. Electrolyte disturbances in critically ill patients
3. Acid-base disorders
4. Sepsis and septic shock
5. Infection control and antibiotic stewardship
6. Nutrition in critically ill patients
7. Glucose management
8. Liver failure and metabolic emergencies
9. Multi-organ dysfunction syndrome (MODS)
10. End-of-life care in critical illness

**UNIT V** (12**hrs)**

**Emergency Procedures and ICU Equipment**

1. Central venous catheter insertion and care
2. Arterial line placement and monitoring
3. Endotracheal intubation and airway management
4. Chest tube insertion and management
5. Use of defibrillator and AED
6. Intravenous drug administration
7. Hemodynamic monitoring devices
8. Sedation and analgesia in ICU
9. Point-of-care ultrasonography (POCUS)
10. Ethical and legal considerations in ICU procedures

**RECOMMENDED TEXT BOOKS**

1. Principles of Critical Care, Jesse B. Hall, Gregory A. Schmidt & John K. Kress, 5th Edition (2022)
2. Textbook of Critical Care, Jean-Louis Vincent, Edward Abraham, Frederick A. Moore, Patrick Kochanek & Mitchell P. Fink, 8th Edition (2022)
3. Oh's Intensive Care Manual, Andrew D. Bersten & Jonathan Handy, 9th Edition (2021)
4. Irwin and Rippe's Intensive Care Medicine, Richard S. Irwin & J. M. Rippe, 9th Edition (2018)
5. Critical Care Secrets, Polly E. Parsons & Jeanine Wiener-Kronish, 6th Edition (2021)

## 2.EMERGENCY ORTHOPEDICS

**L/T/P/C**

**4/-/4/6**

### Learning Objectives:

- To understand musculoskeletal injuries and emergencies.
- To learn fracture management and immobilization techniques.
- To develop skills in handling trauma-related orthopedic conditions.
- To recognize complications and emergency interventions.

### Learning Outcomes:

- Identify common orthopedic emergencies and injuries.
- Apply immobilization and splinting techniques.
- Assist in fracture management and emergency procedures.
- Recognize complications and provide timely intervention.

**(90hrs)**

### UNIT I (18hrs)

**Introduction and Assessment**

1. Scope of orthopaedic emergencies
2. Anatomy and physiology of the musculoskeletal system
3. Initial assessment of orthopaedic trauma
4. ABCDE approach in orthopaedic emergencies
5. Mechanism of injury and trauma patterns
6. History taking in trauma patients
7. Physical examination of musculoskeletal injuries
8. Neurovascular assessment
9. Imaging techniques in orthopaedic emergencies (X-ray, CT, MRI)
10. Documentation and medico-legal aspects

### UNIT II (18hrs)

**Fractures**

1. Classification of fractures (open/closed, simple/complex)
2. Fracture healing physiology
3. Emergency management of fractures
4. Splinting and immobilisation techniques
5. Traction application
6. Compartment syndrome recognition and management
7. Fat embolism syndrome
8. Open fracture management and wound care
9. Pediatric fracture considerations
10. Documentation and follow-up

## UNIT III (18hrs)

**Dislocations and Soft Tissue Injuries**

1. Common joint dislocations (shoulder, hip, elbow)
2. Reduction techniques
3. Ligament and tendon injuries
4. Sprains and strains management
5. Emergency management of soft tissue injuries
6. Crush injuries
7. Neurovascular compromise in dislocations
8. Rehabilitation principles
9. Pain management strategies
10. Documentation of soft tissue injuries

## UNIT IV (18hrs)

**Spine and Pelvic Injuries**

1. Spinal anatomy and injury classification
2. Assessment of spinal cord injury
3. Immobilisation techniques (cervical collar, spine board)
4. Pelvic fractures – classification and management
5. Neurovascular monitoring in spine and pelvis injuries
6. Complications of spinal injuries
7. Traumatic paraplegia and quadriplegia
8. Imaging in spine and pelvic trauma
9. Surgical interventions in spine and pelvic injuries
10. Rehabilitation and physiotherapy principles

## UNIT V (18hrs)

**Pediatric and Geriatric Orthopedic Emergencies**

1. Paediatric trauma assessment
2. Common paediatric fractures and dislocations
3. Growth plate injuries
4. Child abuse recognition
5. Geriatric fracture considerations
6. Osteoporotic fracture management
7. Falls in the elderly and prevention strategies
8. Polytrauma in paediatric and elderly patients
9. Pain and sedation considerations in special populations
10. Rehabilitation and long-term care

**RECOMMENDED TEXT BOOKS**

1. Rockwood and Green's Fractures in Adults, Charles A. Rockwood Jr., David P. Green, Robert W. Bucholz, 9th Edition (2019)
2. Emergency Orthopaedics: The Extremities, James D. Heckman & Michael S. Wiesel, 5th Edition (2017)
3. Orthopaedic Trauma: Diagnosis and Management, John R. McDonald & John J. Callaghan, 4th Edition (2020)
4. Turek's Orthopaedics: Principles and Their Applications, Richard L. Turek, 8th Edition (2019)
5. Paediatric Orthopaedics in Practice, H. K. Patel & Peter J. D. H. Cundy, 3rd Edition (2018)

## 3. RESEARCH METHODOLOGY AND BIOSTATISTICS

**L/T/P/C**

**3/-/-/3**

**Learning Objectives:**

- To understand basic concepts of research design and methods.
- To learn statistical tools and data analysis techniques.
- To develop skills in conducting and presenting research.
- To promote evidence-based practice in healthcare.

**Learning Outcomes:**

- Explain different research methodologies and designs.
- Apply basic statistical methods for data analysis.
- Interpret research findings and draw valid conclusions.
- Conduct and present a simple research study.

**(45hrs)**

1. **Introduction to Research Methodology** **(9hrs)**

   Meaning of research; Objectives of research; Motivation in research; Types of research and research approaches; Criteria for good research; Problems encountered by researchers in India

2. **Identifying Research Problems** **(9hrs)**

   Research problem: Conceptualizing Research: Research questions, hypotheses, constructs, variables

   Testing of Hypothesis: Basic concepts concerning testing of hypotheses; Limitations of testing of hypotheses

3. **Ethical Issues in Research** **(9hrs)**

   Introduction to research ethics (Historical background, Nuremberg, Belmont Report)
   Ethical principles: Autonomy, beneficence, non-maleficence, justice,
   Informed Consent
   Privacy & Confidentiality: Data protection, anonymity, GDPR (General Data Protection Regulation) basics Vs, DigitalPersonalDataProtectionAct2023ofIndia
   Ethical Review process: Role of IRB/IEC, applications.
   Conflict of Interest: Financial, personal, and institutional conflicts.
   Animal research ethics: 3Rs, ethics of animal experimentation
   Components of an ethical research plan: Plagiarism and Academic Misconduct (Fabrication, falsification, retractions); Authorship and Publication Ethics

4. **Research Design** **(9hrs)**

   Meaning of research design and its
   need. Quantitative vs. Qualitative
   Design,
   Experimental Designs: Randomized control trials, pre-post-tests. Quasi-Experimental Designs: Non-randomized designs, time series. Non-Experimental Designs: Correlational cross-sectional, case studies.

5. **Basic concepts of Biostatistics** **(9hrs)**

Introduction: Definition and characteristics of statistics
Importance of the study of statistics; Branches of statistics; Statistics and health sciences; Descriptive and inferential statistics
Variables and their types
Tabulation of data:
Basic principles of graphical representations
Types of diagrams: histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, non-probability curve
Measures of centrality: Need for measures of central tendency; Definition and calculation of mean- ungrouped and grouped; Definition and calculation of Median; Definition and calculation of mode; Comparison of mean, median, and mode. Probability and standard deviation: Meaning of probability or standard deviation; The binomial distribution; The normal distribution; Divergence from normality- skewness and kurtosis

**RECOMMENDED TEXT BOOKS**

1. Research Methodology: Methods and Techniques, C. R. Kothari, 4th Edition (2019)
2. Essentials of Biostatistics in Public Health, Lisa M. Sullivan, 3rd Edition (2021)
3. Medical Statistics: A Textbook for the Health Sciences, Michael J. Campbell, David Machin & Stephen J. Walters, 5th Edition (2018)
4. Practical Research: Planning and Design, Paul D. Leedy & Jeanne Ellis Ormrod, 13th Edition (2020)
5. Fundamentals of Biostatistics, B. K. Mahajan, 9th Edition (2019)

## 4. HOSPITAL AND EMERGENCY ROOM MANAGEMENT

**L/T/P/C**

**4/-/-/4**

### Learning Objectives:

- To understand hospital organization and emergency department workflow.
- To learn resource management and patient flow systems.
- To develop administrative and leadership skills.
- To ensure quality and safety in healthcare delivery.

### Learning Outcomes:

- Explain hospital and emergency room management principles.
- Manage patient flow and emergency services effectively.
- Demonstrate leadership and decision-making skills.
- Apply quality assurance and safety protocols.

**(60hrs)**

**UNIT I** **(12hrs)**

**Introduction to Hospital Management**

1. Overview of hospital administration
2. Roles and responsibilities of the hospital management team
3. Types of healthcare facilities
4. Organisational structure of hospitals
5. Policies and protocols in hospital management
6. Patient flow and hospital workflow
7. Quality assurance and accreditation
8. Hospital ethics and patient rights
9. Legal aspects of hospital management
10. Record keeping and documentation

**UNIT II** **(12hrs)**

**Emergency Room (ER) Organization**

1. Structure and layout of an ER
2. Triage systems and patient prioritisation
3. Role of ER personnel (doctors, nurses, paramedics)
4. ER protocols and standard operating procedures
5. Handling mass casualties and disaster preparedness
6. Infection control and safety in the ER
7. Emergency equipment and supplies management
8. Communication systems in ER
9. Documentation in emergency settings
10. Patient education and family communication

## UNIT III (12hrs)

**Patient Care in Emergency Settings**

1. Initial patient assessment and vital signs monitoring
2. Pain assessment and management
3. Monitoring and managing critically ill patients
4. Emergency drug administration
5. Patient stabilisation and resuscitation
6. Handling trauma and orthopaedic emergencies
7. Managing medical emergencies (cardiac, respiratory, neuro)
8. Pediatric and obstetric emergencies
9. Psychological support for patients and families
10. Ethical decision-making in critical care

## UNIT IV (12hrs)

**Hospital Operations and Resource Management**

1. Inventory management of drugs and consumables
2. Staff scheduling and shift management
3. Budgeting and cost control
4. Coordination between departments
5. Use of hospital information systems (HIS)
6. Infection control policies and audits
7. Waste management in hospitals
8. Safety and emergency preparedness
9. Continuous quality improvement (CQI)
10. Risk management in hospital settings

## UNIT V (12hrs)

**Legal, Ethical, and Performance Evaluation**

1. Healthcare laws and regulations
2. Patient confidentiality and privacy
3. Ethical issues in emergency care
4. Medical negligence and liability
5. Performance evaluation of hospital staff
6. Patient satisfaction assessment
7. Clinical audit in emergency services
8. Reporting and documentation standards
9. Disaster and mass casualty legal aspects
10. Accreditation and quality certifications

**RECOMMENDED TEXTBOOKS**

1. Hospital Administration and Human Resource Management, S. L. Goel, 2nd Edition (2018)
2. Hospital Management: Principles and Practice, S. J. Kabra, 1st Edition (2020)
3. Management of Emergency Services, A. K. Singh & S. K. Gupta, 3rd Edition (2019)
4. Healthcare Operations Management, Daniel B. McLaughlin & Julie M. Hays, 2nd Edition (2017)
5. Textbook of Hospital Administration, Sharma S. R., 4th Edition (2021)

## 5.PRACTICAL SKILL APPLICATIONS IN EMERGENCY MEDICAL SERVICES (EMS)

**L/T/P/C**

**2/-/2/4**

### Learning Objectives:

- To integrate theoretical knowledge into clinical practice.
- To develop hands-on skills in emergency procedures.
- To enhance clinical decision-making and critical thinking.
- To improve teamwork and coordination in emergencies.

### Learning Outcomes:

- Perform essential emergency medical procedures competently.
- Demonstrate clinical decision-making in real scenarios.
- Work effectively within an emergency care team.
- Apply safety and standard protocols in practice.

**(45hrs)**

**UNIT I** **(9hrs)**

**Basic EMS Skills**

1. Scene assessment and safety
2. Primary survey (Airway, Breathing, Circulation)
3. Vital signs measurement
4. Oxygen administration and airway adjuncts
5. CPR and basic life support (BLS)
6. Immobilisation techniques (spinal, limb)
7. Basic wound care and dressing
8. Patient transport techniques
9. Communication with the EMS team and hospital
10. Documentation of patient care

**UNIT II** **(9hrs)**

**Trauma Management**

1. Fracture stabilisation and splinting
2. Management of burns and electrical injuries
3. Haemorrhage control techniques
4. Shock recognition and management
5. Head injury assessment
6. Chest and abdominal trauma management
7. Eye and facial trauma care
8. Spinal injury immobilisation
9. Trauma triage and prioritisation
10. Use of EMS trauma equipment

## UNIT III (9hrs)

**Medical Emergencies**

1. Cardiac emergencies (heart attack, arrhythmias)
2. Respiratory emergencies (asthma, COPD, ARDS)
3. Diabetic emergencies (hypoglycaemia, DKA)
4. Seizures and neurological emergencies
5. Allergic reactions and anaphylaxis
6. Poisoning and overdose management
7. Shock management (hypovolemic, septic)
8. Pediatric and neonatal emergencies
9. Obstetric emergencies
10. Administration of emergency medications

## UNIT IV (9hrs)

**Advanced EMS Skills**

1. Intravenous (IV) and intraosseous (IO) access
2. Advanced airway management
3. Cardiac monitoring and ECG interpretation
4. Use of defibrillators and AEDs
5. Suctioning and oxygen therapy
6. Administration of advanced emergency drugs
7. Capnography and pulse oximetry
8. Mechanical ventilation in pre-hospital settings
9. Monitoring of critically ill patients
10. Documentation and reporting for advanced interventions

## UNIT V (9hrs)

**EMS Systems and Operations**

1. EMS organisational structure and roles
2. Dispatch and communication systems
3. Ambulance types and equipment
4. EMS protocols and standard operating procedures
5. Mass casualty management
6. Disaster preparedness and response
7. Legal and ethical aspects of EMS practice
8. Safety of EMS personnel
9. Patient handover and inter-facility transfer
10. Continuous professional development in EMS

**RECOMMENDED TEXTBOOKS**

1. Emergency Care and Transportation of the Sick and Injured, American Academy of Orthopaedic Surgeons (AAOS), 12th Edition (2021)
2. Prehospital Emergency Care, Joseph J. Mistovich, Keith J. Karren & Brent Q. Hafen, 11th Edition (2020)
3. Principles of Emergency Medical Services, Richard A. Schifrin & Edward T. Meier, 4th Edition (2019)
4. Advanced EMS: Prehospital Emergency Care for Advanced Providers, Bob Elling, 3rd Edition (2018)
5. Emergency Medical Services: Clinical Practice and Systems Oversight, Bob Elling & Lee Ann Murdoch, 2nd Edition (2020)

## 6.CRITICAL CARE MEDICINE – PRACTICAL

**L/T/P/C**

**-/-/2/2**

### Learning Objectives:

- To provide hands-on experience in ICU procedures.
- To develop skills in patient monitoring and life support.
- To practice use of critical care equipment.
- To enhance response to critical situations.

### Learning Outcomes:

- Perform basic ICU procedures and monitoring techniques.
- Demonstrate use of life-support equipment effectively.
- Interpret patient data in critical care settings.
- Respond promptly and efficiently to critical emergencies.

**(30hrs)**

**UNIT I** **(6hrs)**

**Patient Assessment and Monitoring**

1. Primary assessment using the ABCDE approach
2. Vital signs measurement (BP, pulse, respiratory rate, $SpO_2$, temperature)
3. Glasgow Coma Scale (GCS) assessment
4. Pain assessment in critically ill patients
5. Fetal and adult monitoring techniques (if applicable)
6. Fluid balance charting and urine output monitoring
7. Bedside neurological assessment
8. Cardiopulmonary assessment
9. Observation and documentation of patient status
10. Early recognition of deterioration

**UNIT II** **(6hrs)**

**Airway and Respiratory Management**

1. Oxygen therapy administration
2. Use of nasal cannula, face mask, and non-rebreather mask
3. Bag-mask ventilation (BMV)
4. Endotracheal intubation assistance
5. Suctioning techniques (oral, tracheal)
6. Non-invasive ventilation (CPAP/BiPAP)
7. Mechanical ventilator setup and monitoring
8. Weaning from the ventilator
9. Chest physiotherapy
10. Recognition and management of respiratory complications

## UNIT III (6hrs)

**Cardiovascular and Hemodynamic Management**

1. ECG electrode placement and monitoring
2. Cardiac rhythm interpretation basics
3. Blood pressure monitoring (manual and automated)
4. Central venous catheter (CVC) care and monitoring
5. Arterial line setup and monitoring
6. Administration of IV fluids and vasoactive drugs
7. Shock recognition and management
8. CPR and advanced cardiac life support (ACLS) assistance
9. Pulse oximetry and capnography monitoring
10. Documentation of hemodynamic interventions

## UNIT IV (6hrs)

**Renal, Metabolic, and Drug Management**

1. Foley catheter insertion and care
2. Monitoring of urine output and renal function
3. Blood glucose monitoring and insulin administration
4. Electrolyte correction procedures
5. Acid-base balance assessment
6. Administration of IV medications and emergency drugs
7. Nutrition management (enteral and parenteral)
8. Blood sampling and bedside testing
9. Monitoring for multi-organ dysfunction
10. Documentation of drug administration and patient response

## UNIT V (6hrs)

**Emergency Procedures and ICU Equipment**

1. Use of defibrillator and AED
2. Arterial blood gas (ABG) sampling
3. Chest tube care and monitoring
4. Peripheral IV cannulation
5. Intraosseous (IO) access assistance
6. Use of suction devices
7. Setup and use of infusion pumps
8. Bedside ultrasound (POCUS) basics
9. Infection control and sterile technique
10. Documentation of procedures and patient care interventions

**RECOMMENDED TEXTBOOKS**

1. Principles of Critical Care, Jesse B. Hall, Gregory A. Schmidt & John K. Kress, 5th Edition (2022)
2. Textbook of Critical Care, Jean-Louis Vincent, Edward Abraham, Frederick A. Moore, Patrick Kochanski & Mitchell P. Fink, 8th Edition (2022)
3. Oh's Intensive Care Manual, Andrew D. Bersten & Jonathan Handy, 9th Edition (2021)
4. Manual of ICU Procedures, Mohan Gurjar, 2nd Edition (2019)
5. Rang & Dale's Pharmacology for Critical Care, James M. Ritter, 9th Edition (2020)

## 7.ART OF BEING A BETTER PERSON

**L/T/P/C**

**2 /-/-/2**

**Learning Objectives:**

- To promote self-awareness and personal development.
- To develop ethical values and professional behavior.
- To enhance emotional intelligence and resilience.
- To encourage positive attitude and lifelong learning.

**Learning Outcomes:**

- Demonstrate self-awareness and personal growth.
- Exhibit ethical and professional behavior.
- Apply emotional intelligence in personal and professional life.
- Maintain a positive attitude and continuous self-improvement.

**(15hrs)**

**UNIT I** **(2hrs)**

Introduction to Being a Good Human:
Defining “goodness" and ethical living
Overview of moral philosophies: Utilitarianism, Deontology, Virtue Ethics, The role of self-awareness in personal growth

Activity: Reflective journaling on what "being good" means to you.

**UNIT II** **(1hrs)**

The Power of Empathy: Understanding
empathy vs. sympathy
ThesciencebehindempathyanditsbenefitsforsocialconnectionsTechniquesforcultivating empathy in Everyday Life

Activity: Empathy-building exercises and discussions.

**UNIT III** **(1hrs)**

Emotional Intelligence (EQ): What is Emotional
Intelligence? (Self-awareness, self-
Regulation, motivation, empathy, and social skills)The role of EQ in personal and professional relationships

Strategies to improve emotional intelligence

Activity: Self-assessment of emotional intelligence and EQ development exercises.

**UNIT IV** **(1hrs)**

Compassion and Kindness
The science of kindness: How kindness benefits us and others
Practicing kindness in small, everyday actions
Overcoming barriers to kindness (e.g., stress, biases, indifference)
**Activity**: "Random Acts of Kindness" challenge.

**UNIT V** (**1hrs**)

**Personal Integrity and Honesty**
The importance of integrity in personal and professional life
Consequences of dishonesty and lack of integrity
How to align actions with values
**Activity**: Case study discussion on ethical dilemmas and decision-making.

**UNIT VI** (**1hrs**)

**Building Positive Relationships**
Communication skills for healthy relationships
Setting boundaries and respecting others' boundaries
Conflict resolution and forgiveness
**Activity**: Role-playing scenarios to practice healthy communication.

**UNIT VII** (**1hrs**)

**Responsibility and Accountability**
The concept of personal responsibility in life
Accountability in both personal and community contexts
How to take ownership of mistakes and learn from them
**Activity**: Reflect on past mistakes and plan for growth.

**UNIT VIII** (**1hrs**)

**Contributing to the Community and Society**
The role of individuals in building strong communities
Volunteering, activism, and social responsibility
The impact of small, positive actions on a larger scale
**Activity**: Brainstorming session on potential ways to contribute to the local community.

**UNIT IX** (**2hrs**)

**Practicing Gratitude and Contentment**
The psychological and emotional benefits of gratitude
Practicing contentment in a consumer-driven world
Techniques for cultivating a mindset of abundance
**Activity**: Gratitude journal and daily reflection.

**UNIT X** (**2hrs**)

**Living with Purpose and Meaning**
Discovering personal values and purpose
The intersection of passion, skills, and service
Creating a life plan that aligns with core values
**Activity**: Create a personal mission statement.

**UNIT XI** (**2hrs**)

**Overcoming Negative Traits: Greed, Anger, and Envy**
The psychology behind negative emotions and traits
How greed, anger, and envy affect our well-being
Strategies for managing and transforming negative emotions
**Activity**: Mindfulness meditation and reflection exercises.

**Bringing It All Together: A Life of Goodness**
Review of key learnings from the course
Creating a vision for continuous personal growth
How to maintain a positive and ethical life in a challenging world
**Activity**: Final reflection paper or presentation on how students will apply the course's principles to their life.

**Reference Textbook**
1. How to Win Friends and Influence People" by Dale Carnegie
2. The Seven Habits of Highly Effective People" by Stephen R. Covey

**SEMESTER VII**

| Course Code | Course Title | Credits/Week | | | Hours/Semester | | | Assessments | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | P | C | L | T/P | Total | INT | EXT | |
| | Internship | 2 | 20 | 22 | 30 | 900 | 930 | - | 100 | 100 |
| | Project Work | - | 6 | 6 | - | 270 | 270 | - | 100 | 100 |
| **Total** | | **2** | **26** | **28** | **30** | **1170** | **1200** | **-** | **200** | **200** |

## 1.INTERNSHIP I

**L/T/P/C**

**2/-/20/22**

**Learning Objectives:**

- To provide initial clinical exposure in real healthcare settings.
- To apply theoretical knowledge in supervised practice.
- To develop basic clinical and professional skills.
- To understand hospital workflow and patient care systems.

**Learning Outcomes:**

- Demonstrate basic clinical skills under supervision.
- Apply theoretical concepts in real-life situations.
- Adapt to hospital environment and work culture.
- Exhibit professional behavior and responsibility.

**(300hrs)**

**UNIT I** **(60hrs)**

**Orientation and Hospital Setup**

1. Introduction to Emergency Medicine and Critical Care Technology
2. Hospital and ICU organisation
3. Roles of the healthcare team in the ER and ICU
4. Patient safety protocols
5. Infection control in hospital and the ICU
6. Orientation to ICU/ER equipment and monitors
7. Legal and ethical considerations in critical care
8. Documentation and electronic medical records
9. Observation of ICU workflow
10. Introduction to triage systems

## UNIT II (60hrs)

**Patient Assessment and Monitoring**

1. Primary assessment using the ABCDE approach
2. Measurement and interpretation of vital signs
3. Glasgow Coma Scale (GCS) and sedation scoring
4. Pain assessment
5. Monitoring cardiovascular, respiratory, renal, and neurological systems
6. Fluid balance and urine output monitoring
7. Arterial blood gas (ABG) sampling and interpretation
8. ECG monitoring and basic cardiac rhythm recognition
9. Early recognition of deterioration
10. Documentation and handover of patient status

## UNIT III (60hrs)

**Airway and Respiratory Technology**

1. Oxygen delivery devices (nasal cannula, masks, non-rebreather)
2. Bag-mask ventilation (BMV)
3. Non-invasive ventilation (CPAP, BiPAP)
4. Endotracheal intubation assistance
5. Suctioning techniques (oral/tracheal)
6. Mechanical ventilator basics and monitoring
7. Weaning protocols from the ventilator
8. Pulmonary function monitoring devices
9. Chest physiotherapy assistance
10. Infection control in airway management

## UNIT IV (60hrs)

**Cardiovascular and Hemodynamic Technology**

1. ECG setup and interpretation
2. Blood pressure monitoring (manual and automated)
3. Central venous catheter (CVC) care and monitoring
4. Arterial line care and monitoring
5. Hemodynamic monitoring (CVP, MAP)
6. Fluid resuscitation and monitoring
7. Administration of vasoactive drugs
8. Recognition and management of shock
9. CPR and ACLS assistance
10. Documentation of cardiovascular interventions

## UNIT V (60hrs)

**Emergency Procedures and Equipment**

1. Peripheral IV cannulation
2. Intraosseous (IO) access assistance
3. Chest tube care and monitoring

4. Use of defibrillator and AED
5. Point-of-care ultrasonography (POCUS) basics
6. Infusion pumps and alarms
7. Emergency drug preparation and administration
8. Trauma and burn care
9. Paediatric and neonatal emergency procedures
10. Skill logging and competency evaluation

## 1.PROJECT WORK- I

**L/T/P/C**

**-/-/6/6**

**Course Description**

Project Work – I is designed to introduce students to research methodology, project planning, literature review, and proposal development in the field of emergency medicine and critical care technology. Students will identify a research problem, formulate objectives, review literature, and prepare a research protocol under faculty guidance.

**Learning Objectives**

- Understand research methodology in emergency care.
- Identify healthcare-related problems.
- Conduct literature review systematically.
- Prepare research protocol and synopsis.
- Apply ethical principles in research.

**Learning Outcomes**

At the end of the course, students will be able to:

1. Select a suitable research topic in emergency medicine and critical care.
2. Conduct literature review effectively.
3. Formulate objectives and research methodology.
4. Design a research proposal.
5. Demonstrate ethical awareness in clinical research.

**Unit I: Introduction to Research**

- Meaning and importance of research
- Types of research: Basic, applied, clinical, observational, experimental
- Research process and steps
- Identification of research problem in emergency and critical care

**Unit II: Research Design and Literature Review**

- Research question formulation
- Review of literature and data sources
- Study designs: Case study, observational, cross-sectional, cohort, retrospective studies
- Variables and sampling methods

**Unit III: Research Methodology**

- Data collection methods
- Designing questionnaires and case record forms
- Inclusion and exclusion criteria
- Ethical issues and informed consent

**Unit IV: Biostatistics Basics**

- Introduction to statistics
- Data presentation and tabulation
- Measures of central tendency

- Basics of data interpretation

**Unit V: Research Proposal Preparation**

- Writing synopsis/protocol
- Objectives and methodology writing
- Referencing and bibliography
- Presentation of project proposal

**SEMESTER VIII**

| Course Code | Course Title | Credits/Week | | | Hours/Semester | | | Assessments | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
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## 1.INTERNSHIP - II

**L/T/P/C**

**2/-/20/22**

**Learning Objectives:**

- To provide advanced clinical training and exposure.
- To enhance independent clinical decision-making skills.
- To develop competency in handling emergency cases.
- To strengthen teamwork and communication in healthcare.

**Learning Outcomes:**

- Perform clinical procedures with minimal supervision.
- Demonstrate effective decision-making in patient care.
- Handle emergency situations confidently.
- Work efficiently as part of a healthcare team.

**(150hrs)**

**UNIT I** **(30hrs)**

**Advanced Patient Monitoring**

1. Advanced hemodynamic monitoring (CVP, MAP, cardiac output)
2. Continuous ECG monitoring and arrhythmia detection
3. Pulse oximetry and capnography
4. Intracranial pressure (ICP) monitoring basics
5. Renal replacement therapy (RRT) monitoring
6. Ventilator waveform interpretation
7. Oxygen delivery optimisation
8. End-tidal $CO_2$ monitoring
9. Documentation of advanced monitoring
10. Case-based critical care evaluation

## UNIT II (30hrs)

**Specialised Emergency Interventions**

1. Neonatal resuscitation (NRP)
2. Pediatric emergency care
3. Obstetric emergencies (eclampsia, PPH, preterm labour)
4. Advanced airway management
5. Endotracheal tube placement and verification
6. Multi-organ dysfunction management
7. Shock and sepsis management
8. Blood transfusion monitoring
9. Emergency medications (vasopressors, antiarrhythmic)
10. Emergency equipment troubleshooting

## UNIT III (30hrs)

**Trauma and Critical Care Technology**

1. Fracture immobilisation and splinting
2. Wound care and dressing technology
3. Burn management devices
4. Trauma triage technology
5. Monitoring devices for head injury and spinal trauma
6. Infection control in trauma care
7. Documentation of trauma care interventions
8. Portable imaging (X-ray, ultrasound)
9. Rehabilitation support technology
10. Ethical considerations in trauma care

## UNIT IV (30hrs)

**Quality, Safety, and Ethical Practice**

1. Infection prevention and sterile techniques
2. Patient safety protocols
3. ICU audits and quality improvement
4. Clinical quality indicators and standards
5. Ethical decision-making in emergency care
6. Medico-legal considerations
7. Documentation and reporting standards
8. Patient and family counselling
9. Multidisciplinary teamwork in the ICU
10. Reflection and feedback on professional practice

## UNIT V (30hrs)

**Case Management and Professional Development**

1. Case presentations and discussions
2. ICU and ER rounds participation
3. Multidisciplinary case review

4. End-of-life care and palliative support
5. Disaster preparedness and mass casualty management
6. EMS coordination and inter-hospital transfer
7. Continuing education in emergency and critical care technology
8. Competency assessment and skill validation
9. Reflection on learning experiences
10. Preparation for final internship evaluation

## 3. PROJECT WORK- II

**L/T/P/C**

**-/-/6/6**

**Course Description**

Project Work – II focuses on execution of the research project initiated in Project Work – I. Students will collect, analyze, interpret data, prepare the dissertation/report, and present findings relevant to emergency medicine and critical care technology.

**Learning Objectives**

- Execute research work independently.
- Collect and interpret clinical data.
- Prepare a scientific project report.
- Develop communication and presentation skills.
- Apply evidence-based healthcare concepts.

**Learning Outcomes**

At the end of the course, students will be able to:

1. Conduct a research study in emergency medicine/critical care.
2. Analyze and interpret collected data.
3. Write a structured research report.
4. Present scientific findings confidently.
5. Apply research outcomes to clinical practice.

**Unit I: Project Implementation**

- Finalization of methodology
- Data collection in emergency and ICU settings
- Maintenance of records and document tation
- Case-based observations

**Unit II: Data Analysis**

- Data classification and tabulation

- Statistical interpretation
- Graphical representation of results
- Result interpretation

Unit III: Discussion and Findings

- Comparison with previous studies
- Interpretation of outcomes
- Limitations of study
- Clinical relevance of findings

**Unit IV: Report Writing**

- Structure of dissertation/project report
- Abstract, introduction, methodology, results, discussion, conclusion
- Referencing style and bibliography
- Plagiarism and research ethics

**Unit V: Presentation and Viva**

- Preparation of PowerPoint presentation
- Scientific presentation skills
- Project defense and viva voce