MALLA REDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED HEALTHCARE SCIENCES & TECHNOLOGY

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

Program:

Master of Science (M.Sc.)

Physician Associate

(MPA)

2025

MALLA REDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED HEALTHCARE SCIENCES & TECHNOLOGY

Master of Physician Associate

(MPA)

Vision

1. To develop competent and compassionate Physician Associates who contribute to high-quality, patient-centered healthcare.
2. To be a center of excellence in medical education, research, and clinical practice.
3. To promote innovation and lifelong learning in healthcare delivery.
4. To address community health needs through skilled and ethical professionals.

Mission

1. To provide comprehensive medical education integrating theory, clinical skills, and evidence-based practice.
2. To train students in effective patient care, communication, and teamwork.
3. To foster ethical values, professionalism, and cultural sensitivity.
4. To encourage research, critical thinking, and continuous professional development.

Program Educational Objectives (PEOs)

1. Deliver safe, effective, and patient-centered healthcare in diverse clinical settings.
2. Collaborate with multidisciplinary healthcare teams to improve patient outcomes.
3. Engage in lifelong learning and adapt to advancements in medical science.
4. Demonstrate professionalism, leadership, and ethical decision-making in practice.

Program Outcomes (POs)

1. Apply biomedical and clinical knowledge for diagnosis and management of diseases.
2. Perform clinical procedures and patient assessments competently.
3. Communicate effectively with patients, families, and healthcare professionals.
4. Practice evidence-based medicine with ethical and professional responsibility.

Program Specific Outcomes (PSOs)

1. Conduct comprehensive patient history taking and physical examinations.
2. Assist in diagnosis, treatment planning, and clinical decision-making under supervision.
3. Perform essential clinical procedures and emergency care interventions.
4. Participate in preventive, promotive, and community healthcare services.

Course Outcomes (COs)

1. Understand human anatomy, physiology, pathology, and pharmacology relevant to clinical practice.
2. Demonstrate clinical reasoning and diagnostic skills in simulated and real settings.
3. Apply therapeutic interventions and patient management strategies.
4. Exhibit professionalism, ethics, and effective communication in healthcare environments.

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Master of Physician Associate

(MPA)

COURSE STRUCTURE

I year I semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Human Anatomy	3	-	-	3	40	60	100
2		Human Physiology	3	-	-	3	40	60	100
3		Clinical Assessment Techniques	2	-	8	10	40	60	100
4		Pharmacology for Physician Assistants	2	-	-	2	40	60	100
5		Medical Ethics and Law	2	-	-	2	40	60	100
6		Research Methodology and Biostatistics	2	-	-	2	40	60	100
7		Clinical Posting	-	-	-	-	-	-	-
		TOTAL	14		8	22	240	360	600

I year II semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Emergency Medicine and Trauma Care	2	-	2	4	40	60	100
2		Critical Care and Intensive Care	2	-	2	4	40	60	100
3		Core Clinical Medicine I (systems based)	2	-	3	5	40	60	100
4		Pediatrics	2	-	2	4	40	60	100
5		Surgical Skills and Postoperative Care	1	-	2	3	40	60	100
6		Pharmacology in special populations	3	-	-	3	40	60	100
TOTAL			12	-	11	23	240	360	600

II-year III semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Palliative Care	2	-	1	3	40	60	100
2		Core Clinical Medicine II (systems based)	2	-	2	4	40	60	100
3		Geriatrics	2	-	2	4	40	60	100
4		Preventive medicine	2	-	-	2	40	60	100
5		Medical Education-I	1	-	1	2	40	60	100
6		Cardiovascular And Thoracic Surgery	1	-	1	2	40	60	100
7		Clinical posting	-	-	3	3	40	60	100
TOTAL			10	-	10	20	280	420	700

II year IV semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Core Clinical Medicine III (systems based)	2	-	2	4	40	60	100
2		Consents and Medico legal issues	2	-	-	2	40	60	100
3		Rehabilitative Medicine	2	-	-	2	40	60	100
4		Medical Education-II	2	-	1	3	40	60	100
5		Neurosurgery	1	-	1	2	40	60	100
6		Clinical posting	-	-	4	4	40	60	100
7		Thesis/Research Project	-	-	3	3	40	60	100
TOTAL			9		11	20	280	420	700

1.1 Post Graduate Programme

Sl. No.	Course	Duration	Eligibility for admission
1	M.Sc. Physician Associate	2 years	He/she has passed the BSc. Physician Associate in equivalent examination of a recognized Indian University or a duly constituted Board with pass marks (50%).

1.2. Medium of Instruction:

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

1.3. Duration of the Course

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

1.4 Examination Regulations

1.4.1 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.

1.4.2 Internal Assessments:

a) Regular periodic assessment shall be conducted throughout the course. In each semester there will be **two one-hour internal assessments (15 marks each)** and a continuous assessment (10 marks). Thus, a total of 40 marks for the internal exam. (i.e. weightage for internal assessment shall be 40% of the total marks in each subject).

b) **Exam pattern for internal assessment** in each semester will be
(a) Short questions 3 nos. each carrying 5 marks (i.e. 3 x 5=15 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, presentations, extra-curricular activities etc will be assessed. Continuous assessment carries 10 marks.
(d) Thus, a total of 40 marks for the internal examination. (15+15+10=40 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 internal examination will be conducted. The assessment comprised of five assignments/presentations/case presentations each carrying 10 (i.e. 5 x 10 = 50 marks). Final examination will be for 50 marks with 5 questions each carrying 10 marks (5 x 10 = 50 marks). The minimum pass is 40% marks.

1.4.3 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 (60 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 (6 x 5 = 30 marks). (c) Ten very short questions each carrying 1 mark (i.e. 10 x 1 = 10 marks). Thus, a total of 60 marks.
d) The question pattern for practical examination (a) Spotters/major practical/minor practical/case presenting/Viva/practical/log record.
The minimum pass for 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 examination) to pass in each subject.

SEMESTER – I

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Human Anatomy	3	-	-	3	40	60	100
2		Human Physiology	3	-	-	3	40	60	100
3		Clinical Assessment Techniques	2	-	8	10	40	60	100
4		Pharmacology for Physician Assistants	2	-	-	2	40	60	100
5		Medical Ethics and Law	2	-	-	2	40	60	100
6		Research Methodology and Biostatistics	2	-	-	2	40	60	100
7		Clinical Posting	-	-	-	-	-	-	-
		TOTAL	14		8	22	240	360	600

Human Anatomy

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

Learning Objectives

1. To understand the structure and organization of the human body and anatomical terminology.
2. To learn the gross anatomy of body systems and regions with their functions.
3. To develop the ability to apply anatomical knowledge in clinical practice and identification of structures.

Learning Outcomes

1. Describe and apply basic anatomical concepts, terminology, and body organization.
2. Identify and explain the structure and function of major body systems and regions.
3. Apply anatomical knowledge in clinical scenarios and basic diagnostic understanding.

UNIT 1: General Anatomy & Basic Structures (9 hours)

1. **Scope of Anatomy** – Definition, branches, and importance in clinical practice.
2. **Anatomical Position & Terminology** – Standard position, planes, axes, terms (groove, tuberosity, trochanter, etc.).
3. **Cells, Tissues & Basic Concepts** – Overview of body organization.
4. **Bones (Osteology)**

- Composition, functions, classification (long, short, flat, irregular bones)
- Structure & development (ossification, long bone parts)
- Blood supply of bones

5. **Cartilage** – Types (hyaline, elastic, fibrocartilage) and features
6. **Joints (Arthrology)**

- Definition and classification
- Fibrous, cartilaginous, synovial joints & subtypes

7. **Muscles (Myology)**

- Skeletal, smooth, cardiac muscles – comparison
- Blood & nerve supply, motor unit

8. **Integumentary System** – Structure of skin and appendages

UNIT 2: Upper Limb & Thorax (9 hours)

Upper Extremity

1. Osteology: Clavicle, scapula, humerus, radius, ulna, carpals, metacarpals, phalanges
2. Soft tissues:
    - Breast, pectoral region, axilla
    - Arm, cubital fossa, forearm
    - Hand (palm, dorsum, arches)
    - Muscles, nerves, vessels, lymphatics
3. Joints: Shoulder, elbow, radioulnar, wrist, hand joints

Thorax

1. **Thoracic Wall & Mediastinum** – Divisions and contents
2. **Heart**
    - Position, shape, parts
    - Blood supply, nerve supply, conducting system
3. **Respiratory System**
    - Respiratory passages
    - Lungs, pleura, bronchopulmonary segments
4. **Diaphragm** – Attachments, openings, nerve supply, action

UNIT 3: Lower Limb, Vertebral Column & Pelvis (9 hours)

Lower Extremity

1. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals, phalanges
2. Soft tissues:
    - Gluteal region, thigh compartments
    - Femoral triangle, inguinal canal, adductor canal
    - Popliteal fossa, leg compartments
    - Foot (sole, arches, skin)
3. Joints: Hip, knee, ankle, foot joints

Vertebral Column & Trunk

1. Vertebrae: Cervical, thoracic, lumbar, sacral, coccyx
2. Muscles: Prevertebral, paravertebral, intercostal, abdominal
3. Intervertebral disc

Pelvis

1. Pelvic girdle
2. Pelvic floor muscles

UNIT 4: Abdomen, Pelvis & Endocrine System (9 hours)

Abdomen

1. Peritoneum – Types, folds, functions
2. Gastrointestinal organs:
    - Stomach, liver, spleen
    - Intestines, gall bladder
3. Urinary system:
    - Kidneys, ureters, urinary bladder
4. Blood supply of gut

Pelvis & Reproductive System

1. Male & female reproductive organs – structure, blood & nerve supply

Endocrine Glands

1. Hypothalamus & pituitary
2. Thyroid & parathyroid
3. Adrenal glands
4. Pancreatic islets
5. Gonads (ovaries & testes)
6. Pineal gland & thymus

UNIT 5: Head, Neck & Nervous System (9 hours)

Head & Neck

1. Osteology: Skull bones, mandible
2. Muscles: Face, neck, extraocular muscles
3. Blood and nerve supply

Nervous System

1. **Basic Concepts** – Neuron, neuromuscular junction, sensory receptors
2. **Central Nervous System (CNS)**
    - Brain: Cerebrum, cerebellum, brainstem
    - Thalamus, hypothalamus, basal ganglia
    - Ventricular system
3. **Spinal Cord** – Segments and functions
4. **Peripheral Nervous System (PNS)** – Spinal and cranial nerves
5. **Autonomic Nervous System (ANS)**
    - Sympathetic & parasympathetic (CVS, respiratory, urogenital)
6. **Functional Systems**
    - Pyramidal and extrapyramidal systems
    - Blood supply of brain

HUMAN PHYSIOLOGY

L/T/PC
3/-/-/3

Learning Objectives

1. To understand the basic physiological principles of human body systems including cardiovascular, respiratory, renal, endocrine, and nervous systems.
2. To learn the mechanisms of normal body functions such as circulation, respiration, digestion, excretion, and neural control.
3. To develop the ability to correlate physiological concepts with clinical conditions and diagnostics.

Learning Outcomes

1. Explain and apply core physiological concepts and mechanisms of major body systems.
2. Analyze and interpret normal physiological functions and their variations in different conditions.
3. Apply physiological knowledge to clinical scenarios, basic diagnosis, and patient care understanding.

UNIT 1: General Physiology & Cardiovascular System – I (9 hours)

1. **Cell Physiology**

- Cell morphology, organelles – structure & functions
- Transport mechanisms across cell membrane

2. **Body Fluids**

- Distribution and composition

3. **Cardiovascular System (Basics)**

- Physiological anatomy & nerve supply of heart and blood vessels
- Organization of CVS
- Cardiac muscle – structure
- Ionic basis of action potential & pacemaker potential

4. **Cardiac Function**

- Conducting system & impulse conduction
- Cardiac cycle – phases, pressure & volume changes
- Heart sounds – causes and characteristics

UNIT 2: Cardiovascular System – II & Blood (9 hours)

1. **Blood**

- Composition and functions of blood and plasma
- RBC – count, variations, erythropoiesis
- Hemoglobin – structure, function, derivatives
- Anemia, jaundice, blood indices, PCV, ESR

2. **WBC & Immunity**

- Morphology, functions, count, variations
- Immunity (basic)

3. **Platelets & Hemostasis**

- Platelets – morphology, function, count
- Blood coagulation, factors, disorders, anticoagulants

4. **Blood Groups & Transfusion**

- Blood groups, cross matching
- Blood transfusion – indications & complications
- Lymph – formation, circulation, functions

5. **Cardiac Output & Blood Pressure**

- Cardiac output, stroke volume, heart rate regulation
- Arterial blood pressure – determinants, regulation
- Arterial pulse & shock

UNIT 3: Respiratory System (9 hours)

1. Basic Structure & Functions
   - Pleura, tracheobronchial tree, alveoli
   - Respiratory membrane & functions
   - Respiratory muscles

1. **Mechanics of Respiration**
   - Intrapleural & intrapulmonary pressure
   - Breathing mechanism & chest expansion
2. **Lung Function Tests**
   - Spirometry, lung volumes & capacities
   - Vital capacity, MVV, minute ventilation
3. **Gas Exchange & Transport**
   - Pulmonary circulation
   - Ventilation-perfusion ratio
4. **Regulation of Respiration**
   - Neural & chemical regulation
   - Reflexes (Hering-Breuer)
5. **Applied Physiology**
   - Hypoxia, hypercapnia, cyanosis, asphyxia
   - Acclimatization, dysbarism
   - Respiratory changes during exercise

UNIT 4: Gastrointestinal, Renal & Reproductive System (9 hours)

1. **Digestive System**

- Functions of GIT
- Stomach – gastric juice, gastrin, peptic ulcer
- Pancreatic secretion
- Liver, bile, gall bladder

2. **Renal System**

- Structure of nephron, JGA
- Renal blood flow
- Urine formation – GFR, clearance
- Tubular reabsorption
- Concentration & dilution of urine
- Micturition, cystometrogram
- Acid-base balance

3. **Reproductive System**

- Male: spermatogenesis, testosterone
- Female: oogenesis, menstrual cycle

- Pregnancy, placenta, lactation
- Contraception methods

UNIT 5: Endocrine System & Nervous System (9 hours)

1. **Endocrine System**
   - Classification & mechanism of hormones
   - Pituitary, thyroid, parathyroid, adrenal glands
   - Endocrine pancreas
   - Disorders: diabetes, thyroid disorders, etc.
2. **Nervous System – Basics**
   - Organization of CNS & PNS
   - Neuron, nerve fibers, synapse
   - Resting & action potential
3. **Sensory System**
   - Receptors, sensory pathways
   - Pain, touch, temperature sensations
4. **Motor System**
   - Motor cortex, pyramidal & extrapyramidal tracts
   - Muscle tone, reflexes, posture
5. **Higher Functions & Brain**
   - Cerebellum, basal ganglia, limbic system
   - Cerebral cortex – functions (memory, speech)
   - CSF, blood-brain barrier
6. **Autonomic Nervous System**
   - Sympathetic & parasympathetic system
   - Functions and applied aspects

Clinical Assessment Techniques.

L/T/P/C
2/-/8/10

Learning Objectives

- To understand the principles and process of clinical assessment in health-related settings.
- To gain knowledge of different assessment methods including history taking, MSE, psychological testing, and diagnostic frameworks.
- To develop awareness of ethical, cultural, and age-specific considerations in clinical evaluation.

Learning Outcomes

- Perform systematic clinical assessment using history taking, observation, and standardized tools.
- Interpret assessment data and apply diagnostic frameworks such as DSM-5 and ICD-11 for case formulation.
- Demonstrate competence in clinical report writing, risk assessment (suicide, violence, abuse), and ethical patient evaluation across different age groups.

1. Introduction to Clinical Assessment (2hours)
2. The Assessment Process: History Taking & Interviewing Techniques (3hours)
3. Mental Status Examination (MSE) (3hours)
4. Physical Assessment Techniques (for health-related programs) (3hours)
5. Behavioural Observations and Functional Assessments (3hours)
6. Psychological Testing: Intelligence, Personality, Neuropsychological (2hours)
7. Clinical Report Writing & Documentation (2hours)
8. Diagnostic Frameworks: DSM-5 ((Diagnostic and Statistical Manual of Mental Disorders), ICD-11 (International Classification of Diseases) (2hours)
9. Risk Assessment: Suicide, Violence, Abuse (2hours)
10. Cultural and Ethical Considerations in Assessment (2hours)
11. Child and Adolescent Assessment (2hours)
12. Geriatric Assessment (2hours)
13. Integrated Case Formulation (2hours)

Recommended Text Book

1. Handbook of Psychological Assessment by Groth-Marnat, G., & Wright, A. J.
2. Foundations of Mental Health Care by Varcarolis, E. M.

Clinical Assessment Techniques (Practical) (120 hours)

1. History Taking & Interviewing Skills (12hours)

- Practice structured patient history taking
- Conducting clinical interviews (open & closed questions)
- Building rapport and communication skills

2. Mental Status Examination (MSE) (12hours)

- Assessment of appearance, behavior, speech
- Mood, thought process, perception, cognition
- Documentation of MSE findings

3. Physical Assessment Techniques (12hours)

- General physical examination (inspection, palpation, auscultation)

- Vital signs monitoring
- Basic neurological and systemic examination

4. Behavioural Observation & Functional Assessment (12hours)

- Observation of patient behavior in clinical settings
- Functional ability assessment in daily activities
- Recording abnormal behavioral patterns

5. Psychological Testing (Demonstration & Practice) (12hours)

- Basic intelligence testing procedures
- Personality assessment tools (introductory level)
- Neuropsychological screening methods (awareness level)

6. Clinical Report Writing & Documentation (12hours)

- Writing structured clinical reports
- Case sheet preparation
- Maintaining assessment records

7. Diagnostic Application (12hours)

- Practice using DSM-5
- Understanding ICD-11 coding system
- Case-based diagnostic formulation

8. Risk Assessment Practice (12hours)

- Identifying suicide risk indicators
- Violence and abuse risk screening
- Reporting and documentation of high-risk cases

9. Case Formulation Exercises (12hours)

- Integration of assessment data
- Developing biopsychosocial case formulation
- Presentation of clinical cases

10. Age-Specific Assessment Practice (6hours)

- Child and adolescent assessment techniques
- Geriatric patient evaluation methods
- Communication adjustments for different age groups

11. Ethical & Cultural Assessment Practice (6hours)

- Maintaining confidentiality during assessment
- Cultural sensitivity in patient evaluation
- Ethical decision-making in clinical situations

Pharmacology for Physician Assistants (30 hours)

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

Learning Objectives

1. To understand the principles of pharmacology, including pharmacokinetics, pharmacodynamics, and drug regulations.
2. To learn the classification, mechanisms, uses, and adverse effects of major drug groups across body systems.
3. To develop the ability to apply drug knowledge for safe, rational, and effective patient care.

Learning Outcomes

1. Explain the mechanisms, actions, and therapeutic uses of commonly used drugs in different systems.
2. Analyze and identify drug interactions, adverse effects, and safety considerations in clinical practice.
3. Apply pharmacological knowledge to select appropriate drugs for common clinical conditions.

1. Introduction to Pharmacology, Drug Regulations, Schedules, and Safety (1 hour)
2. Pharmacokinetics & Pharmacodynamics (2 hours)
3. Autonomic Nervous System Pharmacology (1 hour)
4. Cardiovascular Pharmacology I – Antihypertensives (1 hour)
5. Cardiovascular Pharmacology II – Antiarrhythmics, CHF drugs, Lipid-lowering agents (1 hour)
6. Antibiotics & Antimicrobials I (1 hour)
7. Antibiotics & Antimicrobials II (1 hour)
8. Endocrine Pharmacology – Diabetes, Thyroid, Adrenal (1 hour)
9. Central Nervous System – Antidepressants, Antipsychotics, Anxiolytics (1 hour)
10. CNS – Anticonvulsants, Parkinson’s, Alzheimer’s, Pain Management (1 hour)
11. Respiratory Pharmacology – Asthma, COPD, Antihistamines (1 hour)
12. GI Pharmacology – GERD, Constipation, IBD (1 hour)
13. Hematologic & Oncology Pharmacology (1 hour)
14. Dermatologic, Ophthalmic, and Otic Drugs (1 hour)

Recommended Text Books

1. Basic & Clinical Pharmacology by Katzung, B. G., & Trevor, A. J.
2. Pharmacotherapeutics for Advanced Practice by Arcangelo, V. P., & Peterson, A. M.

Medical Ethics and Law

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

Learning Objectives

1. Understand fundamental principles of ethics, professionalism, and legal aspects in healthcare and physiotherapy practice.
2. Gain knowledge of ethical guidelines such as Declaration of Helsinki, Nuremberg Code, and Indian Council of Medical Research guidelines.
3. Develop awareness of ethical decision-making in clinical practice, research, publication, and legal responsibilities.

Learning Outcomes

1. Apply ethical principles and professional conduct in clinical and research settings.
2. Demonstrate ability to handle informed consent, confidentiality, and ethical issues including vulnerable populations and conflicts of interest.
3. Integrate legal knowledge (e.g., Consumer Protection Act, Rights of Persons with Disabilities Act) into physiotherapy practice responsibly.

UNIT 1 (3 hours)

Basics of Ethics

- Principles of ethics
- History & evolution of ethics
- Declaration of Helsinki
- Nuremberg Code
- Core principles:
    - Autonomy
    - Beneficence
    - Non-maleficence
    - Justice

UNIT 2 (3 hours)

Professionalism

- Meaning of professionalism
- Professional behavior and responsibilities

UNIT 3 (3 hours)

Ethics in Professional Practice

- Principles in clinical practice
- Privacy & confidentiality
- Shared decision making
- Informed consent
- Equality, equity & justice

UNIT 4 (3 hours)

Research Ethics & ICMR Guidelines

- Indian Council of Medical Research guidelines
- General principles
- Responsible conduct of research
- Risk–benefit assessment

UNIT 5 (3 hours)

Informed Consent

- Process of informed consent
- Components of consent document
- Procedure of obtaining consent
- Special situations
- Waivers & proxy consent

UNIT 6 (3 hours)

Ethics Committee (IEC)

- Roles & responsibilities of IEC
- Ethical review process
- Classification of research projects
- Responsibilities of members
- Communication with investigators & authorities

UNIT 7 (3 hours)

Ethics in Vulnerable Populations

- Types of vulnerable populations
- Challenges in research
- Ethical guidelines for such groups

UNIT 8 (3 hours)

Conflict of Interest

- Definition & types
- Identification
- Management & mitigation
- International collaboration issues

UNIT 9 (3 hours)

Publication Ethics (3 hours)

- Importance of publishing
- Authorship guidelines (International Committee of Medical Journal Editors)
- Plagiarism

UNIT 10 (3 hours)

Laws in Physiotherapy Practice

National Commission for Allied and Healthcare Professions Act (NCAHP Act)

- Consumer Protection Act
- Rights of Persons with Disabilities Act
- Ethical issues in physiotherapy:
    - Clinical

- Research
- Academics

Research Methodology and Biostatistics

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

Learning Objectives

1. Understand core concepts of research methodology, qualitative and quantitative research designs, and biostatistical methods used in health sciences.
2. Develop knowledge of evidence-based research processes including literature search, systematic reviews, meta-analysis, and manuscript writing standards.
3. Build competence in research ethics, data analysis, questionnaire design, plagiarism prevention, and use of scientific indexing databases.

Learning Outcomes

1. Apply appropriate qualitative, quantitative, parametric, and non-parametric statistical methods for data analysis in research studies.
2. Conduct structured literature searches, critically appraise evidence (e.g., PRISMA guidelines, CASP checklist), and interpret systematic reviews and meta-analyses.
3. Design valid research tools, write scientific manuscripts using IMRAD format, avoid plagiarism, and effectively use databases like Scopus, Web of Science, and Google Scholar for academic work.

RESEARCH METHODOLOGY (15 hours)

Introduction to research; Types of research; Defining a research question; Qualitative study designs; Quantitative study; Type I and type II bias; Study design: types
Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.
Sampling design, calculating minimum sample size based on design
Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.
Outcome measures: Use of outcome measures in rehabilitation research
Research Methods: Designing methodology, Reporting results, Type I and Type II bias.
Communicating research.
Evaluating published research: looking at the evidence Introduction to evidence-based practice, evaluating evidence Asking clinical questions
Translating of evidence into practice: strategies
Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

BIOSTATISTICS (15 hours)

Descriptive Statistics and measurement variability; Inferential
Statistics; Comparison of group means: T test; Analysis of variance; Multiple comparison tests
Parametric and non-parametric tests Correlations
Regression
Analysis of frequencies: Chi square Statistical measure of validity and reliability Factorial Design analysis
Power analysis – Determining sample size, Epidemio logical Measures–Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio
Application of various statistical software.

RECOMMENDED TEXT BOOKS

1. Statistical methods in Biology by Bailey, N.T.J
2. Statistical methods by Gupta, S.P
3. Research Methodology by Kumar, R

CLINICAL POSTINGS

Learning Objectives

- To introduce students to the clinical environment and patient care workflow
- To correlate basic anatomy & physiology with real patients
- To develop basic clinical examination and communication skills
- To observe and understand common diseases, treatments, and procedures
- To apply ethical principles and professional behavior in clinical settings

Learning Outcomes

By the end of posting, the student will be able to:

- Perform basic patient interaction and history taking
- Identify normal vs abnormal clinical signs
- Demonstrate basic physical examination skills
- Maintain clinical records and case sheets
- Follow **ethical, legal, and professional guidelines**
- Correlate **theory with clinical findings**

1. Hospital Orientation

- Introduction to hospital departments:
    - OPD (Outpatient Department)

    - IPD (Inpatient wards)
    - Emergency/Casualty
- Roles of healthcare team:
    - Doctors, nurses, physician assistants
- Basic hospital protocols:
    - Infection control
    - Biomedical waste management
- Patient flow system

2. General Medicine Posting

- Observation of common conditions:
    - Hypertension, diabetes, fever, infections
- Basic clinical skills:
    - History taking (chief complaint, history of present illness)
    - Recording vital signs (BP, pulse, temperature, respiratory rate)
- Systemic examination (intro level):
    - Cardiovascular system
    - Respiratory system
- Correlation with:
    - Physiology (CVS, respiratory)
    - Pharmacology (basic drugs)

3. General Surgery Posting

- Pre-operative and post-operative care observation
- Sterilization and aseptic techniques
- Wound care and dressing techniques
- Identification of surgical instruments
- Observation of minor procedures

4. Orthopedics / Musculoskeletal Posting

- Basic bone and joint examination
- Fractures and immobilization techniques
- Gait observation
- Application of anatomy knowledge:
    - Upper limb
    - Lower limb

5. Respiratory & Cardiology Observation

- Lung examination:
    - Inspection, palpation, percussion, auscultation
- Heart examination:
    - Heart sounds
- Observation of investigations:
    - ECG (Electrocardiogram)
    - Chest X-ray

6. Clinical Assessment Practice

- Detailed history taking:
    - Personal, medical, family history
- Mental Status Examination (MSE)
- Behavioural observation
- Risk assessment basics:
    - Suicide, violence indicators

7. Basic Nursing & Patient Care Skills

- Bed making
- Patient positioning
- Hygiene care
- Assisting in feeding and mobility

8. Pharmacology in Practice (6 hours)

- Drug chart reading
- Routes of drug administration:
    - Oral, IV, IM
- Observation of drug administration
- Understanding prescriptions

9. Ethics & Communication Skills

- Doctor–patient communication
- Informed consent process
- Confidentiality and privacy
- Professional behavior in wards

10. Record Keeping & Case Presentation

- Case sheet writing
- Clinical documentation
- Basic case presentation:
    - History
    - Examination findings
    - Provisional diagnosis

SEMESTER – II

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Emergency Medicine and Trauma Care	2	-	2	4	40	60	100
2		Critical Care and Intensive Care	2	-	2	4	40	60	100
3		Core Clinical Medicine I (systems based)	2	-	3	5	40	60	100
4		Pediatrics	2	-	2	4	40	60	100
5		Surgical Skills and Postoperative Care	1	-	2	3	40	60	100
6		Pharmacology in special populations	3	-	-	3	40	60	100
TOTAL			12	-	9	23	240	360	600

Emergency Medicine and Trauma Care

L/T/P/C
2/-/2/4

Learning Objectives

- To understand the principles, organization, and scope of emergency medicine, including triage and patient prioritization in acute care settings.
- To gain knowledge of emergency assessment, resuscitation techniques, trauma care, and management of medical and surgical emergencies.
- To develop awareness of diagnostic tools, disaster management, and medico-legal and ethical responsibilities in emergency care.

Learning Outcomes

- Perform rapid patient assessment using ABCDE approach and provide initial stabilization in emergency situations.
- Apply life support skills (BLS, ACLS, PALS), trauma protocols, and manage common medical, surgical, and toxicological emergencies effectively.
- Demonstrate competence in emergency procedures, clinical decision-making, communication, documentation, and ethical-legal practices in the emergency department.

UNIT-1 (3hours)

Introduction to Emergency Medicine:

Scope and importance of emergency care; Emergency department organization and patient flow; Triage principles and prioritization; Roles and responsibilities of PA in emergency settings

UNIT-2 (3hours)

Patient Assessment & Safety: Initial stabilization:

ABCDE approach (Airway, Breathing, Circulation, Disability, Exposure); Focused physical examination in emergent patients; History taking in acute settings; Communication and

handover protocols

UNIT-3 (3hours)

Resuscitation & Life Support:

Basic Life Support (BLS) principles; Advanced Cardiac Life Support (ACLS) algorithms; Pediatric Advanced Life Support (PALS) essentials; Airway assessment and management (bag-mask, intubation basics); CPR skills and defibrillation basics

UNIT-4 (3hours)

Shock & Critical Care:

Recognition and management of shock types (hypovolemic, cardiogenic, septic, anaphylactic); Fluids and hemodynamic support; Monitoring and stabilization in acute care settings; Roles of critical care support in the ED

UNIT-5 (3hours)

Trauma Care & Life-Threatening Injuries:

Trauma assessment protocols: Primary and Secondary surveys; Management principles in Advanced Trauma Life Support (ATLS) framework; Shock resuscitation in trauma; Head injury and Glasgow Coma Scale (GCS)Chest, abdominal, pelvic trauma evaluation; Extremity injuries, compartment syndrome; Special trauma populations (children, elderly, pregnancy)

UNIT-6 (3hours)

Medical Emergencies:

Medical conditions frequently seen in ED such as:

Cardiovascular: MI, arrhythmias, heart failure

Respiratory: severe asthma, COPD exacerbation, pulmonary edema

Neurological: stroke, seizures

Metabolic & endocrine emergencies Sepsis and toxicologic emergencies

UNIT-7 (2hours)

Toxicology & Environmental Emergencies:

Poisonings (organophosphates, sedatives, etc.); Overdose evaluation and management; Environmental emergencies: heat stroke, hypothermia, drowning; Principles of decontamination and antidotes

UNIT-8 (2hours)

Orthopedic and Soft Tissue Emergencies:

Fracture recognition and initial management; Dislocations and splinting; Wound care and laceration repair basics; Management of sprains and strains

UNIT-9 (2hours)

Pediatric & Obstetric Emergencies:

Pediatric assessment and age-specific presentations; Neonatal resuscitation basics;Obstetric emergencies: eclampsia, hemorrhage; Trauma in pregnancy-specific concerns

UNIT-10 (2hours)

Diagnostic Tools & Emergency Procedures:

Point-of-care ultrasound (POCUS) basics; ECG interpretation in the emergency context; Arterial blood gas (ABG) interpretation; Basic emergency procedures (IV access, urinary catheterization, basic airway adjuncts)

UNIT-11 (2hours)

Disaster Management & Pre-Hospital Care:

Mass casualty triage systems; Basic principles of disaster preparedness; Pre-hospital emergency care considerations; Ambulance services and coordination

UNIT-12 (2hours)

Legal, Ethical & Professional Issues:

Medico-legal responsibilities in the ED; Consent in emergency situations; Documentation standards; Ethical dilemmas and decision-making

Recommended Text Books

1. Tintinalli's Emergency Medicine: A Comprehensive Study Guide
2. Textbook of Emergency & Trauma Care - Devendra Richhariya
3. Textbook of Emergency Medicine: Including Intensive Care & Trauma - Devendra Richhariya & Bhawana Sharma

Practical (15 hours)

Learning Objectives

1. To develop skills in initial emergency assessment and stabilization using ABCDE approach and basic triage.
2. To perform essential emergency procedures like CPR, IV access, airway management, and basic trauma care.
3. To understand management of common medical, pediatric, obstetric, and disaster emergencies with proper documentation and safety practices.

Learning Outcomes

1. Students will be able to assess and manage emergency patients effectively in the ED setting.
2. Students will demonstrate basic life-saving and procedural skills like CPR, IV cannulation, and wound care.
3. Students will respond appropriately to common emergencies and follow medico-legal and ethical guidelines.

- ED (Emergency ward) setup & patient flow choodadam
- Triage categories (Red, Yellow, Green) practice
- PPE use & hand hygiene
- **ABCDE assessment** practice
- Simple history taking (AMPLE)
- Patient handover (SBAR)
- **CPR (adult & child)** practice
- AED use
- Bag-mask ventilation
- Basic airway methods
- Shock signs identify cheyadam
- IV line petadam & fluids ivvadam
- Oxygen ivvadam
- Trauma primary survey

- GCS scoring
- Fracture splinting
- Bleeding control & wound dressing
- ECG teesukovadam
- Nebulization
- Sugar check (glucometer)
- Stroke (FAST) & seizure management
- Poison cases basic care
- Gastric lavage (demo)
- Antidote awareness
- Heat stroke / hypothermia care
- Bandaging & splints
- Suturing basics
- Sprain care (RICE)
- Pediatric vitals check
- Pediatric CPR
- Neonatal resuscitation basics
- Delivery assistance (demo)
- IV cannulation
- Catheterization
- ECG lead placement
- ABG (demo)
- Disaster triage basics
- Ambulance & patient transport
- Case sheet writing
- Consent taking
- Basic medico-legal knowledge

Critical Care and Intensive Care

L/T/P/C
2/-/2/4

Learning Objectives

- To understand the principles, organization, and scope of critical care medicine, including ICU workflow and roles of healthcare professionals.
- To gain knowledge of pathophysiology, pharmacological management, and advanced life-support systems in critically ill patients.
- To develop awareness of monitoring techniques, ventilation strategies, and management of multi-system critical conditions.

Learning Outcomes

- Assess and manage critically ill patients using clinical reasoning, monitoring tools, and interpretation of investigations.
- Apply principles of airway management, mechanical ventilation, pharmacotherapy, and shock management in ICU settings.

- Demonstrate competence in handling multi-organ dysfunction, infection control, and providing safe, ethical, and effective critical care.

UNIT-1 (3hours)

Introduction to Critical Care Medicine:

Definition, scope and principles of critical care; Roles of PA/allied health in ICU settings; ICU organization & workflow; Critical thinking and prioritization in critical care; Scope of ICU services (Medical, Surgical, Trauma, Cardiac, Neuro, Pediatric)

UNIT-2 (4hours)

Pathophysiology of Critical Illness:

Physiological changes in shock states; Multiple Organ Dysfunction Syndrome (MODS); Sepsis and septic shock; Systemic inflammatory response; Respiratory failure, cardiovascular collapse, renal impairment; Acid-base, fluid and electrolyte derangements.

UNIT-3 (4hours)

Pharmacology in Critical Care:

Sedatives, analgesics, paralytics and vasopressors; Antibiotics and antimicrobial stewardship; ICU drug protocols and titrations; Adverse reactions and therapeutic monitoring; Sedation scales and pain assessment

UNIT-4 (4hours)

Airway & Ventilation Management:

Airway assessment and stabilization; Endotracheal intubation techniques
Mechanical ventilation principles: Modes of ventilation; Settings adjustments;
Non-invasive ventilation (CPAP/BiPAP)
Weaning preparedness & extubation criteria; Arterial blood gas (ABG) interpretation

UNIT-5 (3hours)

Monitoring & ICU Therapeutics:

Vital signs and advanced monitoring: ECG, pulse oximetry, invasive pressures; Hemodynamic monitoring
Laboratory investigations in critical care; Bedside imaging and point-of-care ultrasound (POCUS); Renal replacement therapy basics; Nutritional support in ICU patients

UNIT-6 (3hours)

Cardiovascular & Shock Management:

Recognition and classification of shock; Fluid resuscitation strategies; Vasopressors and inotropes guidelines; Acute coronary syndromes in ICU; Arrhythmia management in critical patients.

UNIT-7 (3hours)

Respiratory & Pulmonary Care:

ARDS (acute respiratory distress syndrome); COPD/asthma exacerbations; Pulmonary infections; Mechanical ventilator complications; Chest trauma and ventilator support planning

UNIT-8 (3hours)

Neurological & Renal Critical Care:

Neurological monitoring (GCS, ICP basics); Stroke care in ICU; Renal failure and acute

kidney injury in ICU; Electrolyte imbalance correction; Seizure management in critically ill patients

UNIT-8 (3hours)

Infectious & Multi-System Emergencies:

Sepsis identification and management; Antibiotic timing and optimization; multi-organ failure strategies; Supportive care for systemic infections

Recommended Text Books

1. Handbook of Critical Care (Deepak Malviya & Soumya Sankar Nath)
2. ICU Manual (Rahul Anil Pandit — Jaypee)
3. Textbook of Critical Care: Including Trauma and Emergency Care (Jeetendra Sharma & Yatin Mehta)

Practical (30 hours)

Learning Objectives

1. To develop skills in ICU setup, patient monitoring, and basic critical care assessment using ABC approach and GCS.
2. To understand and assist in essential ICU procedures like airway management, ventilation, ABG, IV therapy, and shock management.
3. To gain knowledge of management of major critical conditions including sepsis, cardiac, respiratory, neurological, and renal emergencies with infection control practices.

Learning Outcomes

1. Students will be able to perform basic ICU patient assessment and monitoring effectively.
2. Students will demonstrate understanding of essential life-support procedures such as airway care, ventilation support, and shock management.
3. Students will apply basic critical care principles in managing multi-system emergencies with proper safety and infection control practices.

- ICU setup & patient flow observation
- Roles of PA in ICU & teamwork in critical care
- Patient monitoring (ECG, SpO_2, BP, vitals)
- Basic patient assessment in ICU
- ABC approach in critically ill patients
- GCS scoring & neurological monitoring
- Airway management practice
    - Airway positioning
    - Bag-mask ventilation
    - Intubation (demo/simulation)
    - Suctioning techniques
- Oxygen therapy & ventilator basics
    - Ventilator modes (basic understanding)
    - CPAP/BiPAP demonstration
    - Weaning & extubation observation
- ABG sample collection & interpretation (basic)
- Fluid therapy & IV line management

- Vasopressor / inotrope handling (demo-based)
- Shock patient identification & management practice
- Sepsis recognition & emergency care steps
- Antibiotic administration protocols (awareness level)
- Cardiac monitoring
  - ECG interpretation basics
  - Arrhythmia identification (basic)
  - Acute coronary syndrome management (demo)
- Respiratory care
  - Asthma/COPD emergency management
  - ARDS patient support (observation)
  - Chest trauma care basics
- Neurological care
  - Stroke assessment
  - Seizure management in ICU
  - ICP monitoring awareness
- Renal care
  - AKI patient monitoring
  - Electrolyte imbalance correction (basic understanding)
  - Dialysis (RRT) observation
- Infection control in ICU
  - Hand hygiene & sterile techniques
  - Sepsis bundle awareness
  - Multi-organ failure supportive care
- Nutritional support in ICU (basic feeding methods awareness)
- Bedside investigations & POCUS observation

Core Clinical Medicine I (systems based)

L/T/P/C
2/-/3/5

Learning Objectives

- To understand the pathophysiology, epidemiology, and clinical features of common cardiovascular, respiratory, and gastrointestinal diseases.
- To gain knowledge of diagnostic methods including ECG, chest X-ray, spirometry, and relevant laboratory investigations.
- To develop clinical reasoning in assessment, differential diagnosis, and management of system-based disorders.

Learning Outcomes

- Assess patients with cardiovascular, respiratory, and gastrointestinal complaints using history, examination, and appropriate investigations.
- Interpret diagnostic tools such as ECG, echocardiography, chest X-ray, and spirometry for clinical decision-making.
- Apply knowledge to diagnose and assist in management of common conditions like hypertension, COPD, tuberculosis, hepatitis, and heart failure.

UNIT-1 (10hours)
Cardiovascular System

Pathogenesis & epidemiology of heart diseases
Clinical features, diagnosis & management of: Hypertension; Coronary artery disease (Angina, MI); Heart failure and cardiomyopathies; Valvular heart diseases; Pericardial diseases
Cardiac investigations: ECG, Echocardiography, stress testing

UNIT-2 (10hours)
Respiratory System
Pathophysiology and clinical assessment
Common conditions: Asthma, COPD; Pulmonary infections (including tuberculosis); Pleural effusion, pneumothorax; Respiratory failure
Interpretation of chest X-ray and spirometry

UNIT-3 (10hours)
Digestive System & Hepatobiliary
Disorders of: Esophagus, stomach & intestines (peptic ulcer, IBD)
Liver (hepatitis, cirrhosis)
Pancreas & biliary (pancreatitis, cholelithiasis)
Jaundice: causes and work-up; Abdominal pain assessment and differential diagnosis

Practical (30 hours)

Clinical posting in departments including Cardiology, respiratory/pulmonology and gastroenterology

Recommended Text Books
1. Manual of Clinical Medicine (Vol. I & II) - Dr. Ashis Kumar Saha
2. Clinical Medicine: A Textbook of Clinical Methods and Laboratory Investigations – KV Krishna Das
    1. Principles of Critical Care - Farokh Erach Udwadia

Pediatrics

L/T/P/C
2/-/2/4

Learning Objectives
- To understand principles of pediatric care, growth and development, nutrition, and preventive pediatrics.
- To gain knowledge of common pediatric diseases, system-based disorders, and neonatal care.
- To develop awareness of pediatric emergencies, immunization practices, and ethical-legal aspects in child healthcare.

Learning Outcomes
- Explain normal growth, development, nutrition, and immunization schedules (e.g., National Immunization Schedule).
- Identify clinical features, diagnosis, and basic management of common pediatric and neonatal disorders.
- Apply knowledge to recognize pediatric emergencies and provide initial management appropriately.

UNIT-1 (3hours)

Introduction to Pediatrics:

Scope and principles of Pediatrics; Role of PA/allied health professionals in pediatric care; Differences between child and adult physiology; Pediatric age groups and normal growth patterns; Ethical and legal aspects in child healthcare.

UNIT-2(3hours)

Growth, Development & Nutrition:

Normal growth and development milestones; Physical, cognitive, emotional, and social development; Growth charts and developmental screening; Infant and child nutrition; Breastfeeding and complementary feeding; Protein-energy malnutrition; Micronutrient deficiencies (iron, vitamin A, iodine)

UNIT-3 (3hours)

Preventive Pediatrics:

Immunization schedules (National Immunization Schedule – India); Vaccine storage and cold chain; Adverse events following immunization (AEFI); School health programs; Child abuse and neglect – identification and reporting

UNIT-4 (3hours)

Pediatric System-Based Disorders

Respiratory System: Acute respiratory infections; Pneumonia, bronchiolitis; Asthma in children

Gastrointestinal System: Acute and chronic diarrhea; Dehydration and ORS therapy; Worm infestations

UNIT-5 (2hours)

Cardiovascular System:

Congenital heart diseases (basic understanding); Rheumatic fever and rheumatic heart disease

UNIT-6 (2hours)

Nervous System:

Seizures and epilepsy; Febrile seizures; CNS infections (meningitis, encephalitis)

UNIT-7 (3hours)

Renal & Genitourinary System:

Urinary tract infections; Nephrotic syndrome (overview)

UNIT-8 (3hours)

Infectious Diseases in Children:

Common bacterial and viral infections; Tuberculosis in children; Dengue, malaria, enteric fever; HIV in pediatric population (overview)

UNIT-9 (3hours)

Hematology & Endocrine Disorders:

Anemia in children; Bleeding disorders (basic concepts); Diabetes mellitus in children; Thyroid disorders

UNIT-10 (3hours)

Pediatric Emergencies:

Pediatric assessment triangle (PAT); Shock in children; Acute respiratory distress; Seizures and status epilepticus; Dehydration and electrolyte imbalance; Pediatric Basic Life Support (PBLS) – principles

UNIT-11 (2hours)

Neonatology (Basics):

Care of the normal newborn; Low birth weight and preterm infants; Neonatal jaundice; Neonatal sepsis (overview); Breastfeeding and newborn nutrition

Practical (30 hours)

Learning Objectives

- To develop skills in pediatric history taking and clinical examination.
- To gain hands-on experience in growth monitoring, drug dose calculation, and basic pediatric procedures.
- To learn infection control, immunization practices, and patient care in pediatric settings.

Learning Outcomes

- Perform pediatric assessment including growth and developmental evaluation and clinical examination.
- Assist in procedures such as sample collection, IV line setup, nebulization, and oxygen therapy.
- Demonstrate competence in pediatric patient care, communication, documentation, and infection control practices.

Clinical posting in Pediatric OPDs, Pediatric wards, Neonatal Unit, Pediatric emergency, Pediatric immunization clinics

Clinical skills in Paediatric history taking, Growth & developmental assessment, Drug dose calculation, Sample collection (blood, urine), IV line assistance, Nebulization & oxygen setup, Infection control practices.

Recommended Text Books

1. Partha's IAP Textbook of Pediatrics (3 Vols)- Edited by PSN Menon & team
2. Principles and Practice of Pediatrics - JN Sharma
3. IAP Textbook of Pediatrics - Indian Academy of Pediatrics (IAP)

Surgical Skills and Postoperative Care

L/T/P/C
1/-/2/3

Learning Objectives

- To understand principles of surgical care including preoperative, intraoperative, and postoperative management.
- To gain knowledge of operating room protocols, anesthesia basics, and patient safety measures.
- To develop awareness of postoperative care, complications, documentation, and ethical-legal aspects in surgical practice.

Learning Outcomes

- Explain surgical care continuum including patient preparation, intraoperative assistance, and postoperative management.
- Apply knowledge of asepsis, anesthesia, monitoring, and complication management in surgical settings.
- Demonstrate understanding of clinical documentation, communication, and ethical-legal responsibilities in perioperative care.

UNIT-1 (2hours)

Introduction to Surgical Practice:
Scope and role of PA/allied clinicians in surgical settings; Principles of surgical patient care continuum; Surgical ethics and informed consent; Asepsis and antisepsis; Sterilization techniques and OR protocols; Patient safety fundamentals

UNIT-2 (2hours)

Preoperative Assessment & Preparation:
Surgical history and focused physical examination; Risk assessment (ASA grading, comorbidities); Preoperative investigations; Optimization of chronic conditions prior to surgery; Pre-operative fasting and medication management; Informed consent and patient counselling

UNIT-3 (2hours)

Operating Room (OR) Practices:
OR layout and sterile zones; Surgical instruments identification and handling; Surgical attire, hand scrub, gowning, gloving; Instrument trays and setup; Role of PA/allied staff in OR assistance; Surgical counts (sponges, instruments) and safety checks

UNIT-4 (2hours)

Intraoperative Support Skills:
Assisting in different types of surgeries; Maintaining sterile fields; Retractor handling and operative table management; Team communication in theatre; Observing and assisting with surgical procedures across specialties.

UNIT-5 (2hours)

Anaesthesia & Intraoperative Monitoring:
Basic principles of anaesthesia (general, regional, local); Monitoring vital parameters; Recognizing and responding to intraoperative changes; Anesthesia equipment basics; Pain

control planning for the postoperative phase

UNIT-6 (2hours)

Postoperative Care

Immediate & ongoing management: Transfer and handover from theatre to recovery; Postanaesthesia monitoring (airway, breathing, circulation); Pain assessment and multimodal analgesia approaches; Fluid, electrolyte, and nutrition management; Wound care, drainage management, dressing changes; Critical vital sign interpretation; Recognition and early management of complications (infections, bleeding, DVT, pulmonary issues); Principles of surgical ICU care; Ventilator basics and weaning protocols; Acid-base and blood gas interpretation; Sepsis and shock management strategies; Delirium and postoperative psychosis management

UNIT-7 (2hours)

Clinical Documentation & Communication:

Surgical note writing & perioperative documentation; Case summaries and progress notes; Reporting adverse events; Team communication and handoffs; Patient education on postoperative self-care plans

UNIT-8 (1hours)

Professional Ethics and Legal Considerations:

Informed consent and patient rights; Confidentiality in surgical care; Medico-legal aspects of operative and postoperative complications; Ethical decision making in perioperative care.

Practical (30 hours)

Learning Objectives

- To develop skills in preoperative patient assessment and preparation for surgery.
- To gain hands-on experience in assisting surgical procedures and maintaining sterile techniques.
- To learn postoperative monitoring, patient care, and clinical documentation.

Learning Outcomes

- Perform preoperative assessment, assist in minor/major surgeries, and maintain aseptic techniques in the OR.
- Monitor postoperative patients including vital signs, pain, fluid balance, and early complication detection.
- Demonstrate competence in documentation, communication, and patient education for postoperative care.

2. Preoperative assessments including taking complete surgical history, performing systematic physical examination, assist surgeons in pre-anaesthetic check-up, consent procedures, Prepare patients for surgery: Fasting protocols, bowel preparation, skin preparation

3. Assisting surgeons in minor surgeries (I&D, suturing, biopsies) as well as major surgeries. Training in immediate Post-Op care: Monitoring vital signs, Level of

consciousness, Oxygen saturation, Pain assessment and management, Fluid and electrolyte balance, Intake–output charting. Clinical Documentation & Communication

Recommended Text Books

1. A Guide to Medical Surgical Nursing (Ghosh)
2. Comprehensive Medical Surgical Nursing (Ansari)
3. TNAI Medical Surgical Nursing: A Nursing Process Approach
4. Adult Health Nursing-I: Medical-Surgical Nursing (Jaypee / Elsevier India)

Pharmacology in Special Populations

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

Learning Objectives

- To understand pharmacokinetic and pharmacodynamic variations in special populations.
- To gain knowledge of safe and rational drug use in pediatric, geriatric, pregnant, and critically ill patients.
- To develop awareness of drug safety, pharmacovigilance, and individualized therapy.

Learning Outcomes

- Apply principles of dose adjustment and drug selection in special populations.
- Identify and manage adverse drug reactions and drug interactions effectively.
- Demonstrate safe prescribing practices and patient counseling with focus on vulnerable groups.

UNIT 1 (6 hours)

Introduction to Special Populations

- Definition and clinical importance
- Physiological & biochemical differences affecting drug therapy
- Principles of rational pharmacotherapy in vulnerable groups

UNIT 2 (7 hours)

Pharmacokinetics & Pharmacodynamics

- ADME (Absorption, Distribution, Metabolism, Excretion)
- PK/PD changes with age, pregnancy, disease
- Altered physiology effects (GI, plasma proteins, renal clearance)

UNIT 3 (7 hours)

Pediatric Pharmacology

- Growth & developmental physiology
- Drug metabolism (enzymes & transporters)
- Weight/age-based dosing
- Safe prescribing & formulations
- Adverse drug reactions in neonates & children

UNIT 4 (7 hours)

Geriatric Pharmacology

- Age-related physiological changes
- Polypharmacy & drug interactions
- Beers Criteria
- Dose adjustment & pharmacovigilance
- Monitoring therapeutic outcomes

UNIT 5 (6 hours)

Pregnancy & Lactation

- Physiological changes affecting PK/PD
- Placental drug transfer & fetal exposure
- Teratogenic risk assessment
- Safe drug use in pregnancy & breastfeeding

UNIT 6 (6 hours)

Other Special Populations

- Obesity & altered drug distribution
- Critical illness (shock, sepsis)
- Ethnic & genetic variability
- Basics of pharmacogenomics

UNIT 7 (6 hours)

Drug Safety, Monitoring & Pharmacovigilance

- Adverse drug reaction (ADR) reporting
- Risk reduction strategies
- Patient counselling for adherence
- Clinical documentation & audit

Recommended Text Books

1. Essentials of Medical Pharmacology – K. D. Tripathi
2. Pharmacology for Allied Health Sciences – Padmaja Udaykumar

SEMESTER – III

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		Palliative Care	2	-	1	3	40	60	100
2		Core Clinical Medicine II (systems based)	2	-	2	4	40	60	100
3		Geriatrics	2	-	2	4	40	60	100
4		Preventive medicine	2	-	-	2	40	60	100
5		Medical Education-I	1	-	1	2	40	60	100
6		Cardiovascular And Thoracic Surgery	1	-	1	2	40	60	100
7		Clinical posting	-	-	3	3	40	60	100
TOTAL			10	-	10	20	280	420	700

Palliative Care

L/T/P/C
2/-/1/3

UNIT-1 (6 hours)

Introduction to Palliative Care & Principles

- Definition, concept and philosophy of palliative care
- WHO definition and models of palliative care
- Scope of palliative care in chronic and life-limiting illnesses
- Principles of holistic care (physical, psychological, social, spiritual)
- Role of Physician Associate in palliative care team
- Ethics in palliative and end-of-life care
- Basics of communication in serious illness

UNIT-2 (6 hours)

Symptom Assessment & Management

- Pain physiology and classification of pain
- WHO pain ladder and analgesic principles
- Management of common symptoms:
  - Pain
  - Dyspnea
  - Nausea and vomiting
  - Constipation

    - Fatigue and anorexia
    - Delirium, anxiety and depression
- Basics of palliative pharmacology (opioids, adjuvants)
- Symptom control strategies in advanced illness

UNIT-3 (6 hours)

Communication, Psychosocial & Spiritual Care

- Communication in serious and terminal illness
- Breaking bad news (SPIKES protocol)
- Psychological issues in palliative care (anxiety, depression, grief)
- Family counseling and caregiver burden
- Cultural and spiritual aspects of care
- Bereavement and grief support
- Patient-centered communication skills

UNIT-4 (6 hours)

End-of-Life Care & Ethical Issues

- Dying process and recognition of end-of-life stage
- Principles of end-of-life care
- Advance care planning and directives
- DNR (Do Not Resuscitate) and its implications
- Withdrawal and withholding of life-sustaining treatment
- Ethical issues in palliative care
- Legal aspects of euthanasia (Indian context overview)

UNIT-5 (6 hours)

Palliative Care Settings & Special Populations

- Hospital-based, hospice, and home-based palliative care models
- Community palliative care services
- Pediatric palliative care principles
- Care of elderly patients in palliative settings
- Rehabilitation and quality of life improvement
- Role of multidisciplinary team in palliative care
- Caregiver support and education

Practical (15 hours)

- Palliative care ward / hospice setup observation
- Patient flow and multidisciplinary team functioning
- Basic patient assessment (physical, psychological, social needs)
- Pain assessment using scales (VAS, NRS)
- Symptom assessment (breathlessness, nausea, constipation, fatigue)
- Communication skills practice
    - Patient–doctor interaction
    - Breaking bad news (role-play – SPIKES model)
    - Family counseling simulation
- Basic palliative care procedures
    - Comfort positioning of patients
    - Oral care, hygiene care, pressure sore prevention
    - Feeding support and nutritional care

- Pain and symptom management (case-based practice)
  - Medication chart review
  - Basic opioid dose understanding (simulation level)
- End-of-life care practice
  - Recognition of dying patient signs
  - DNR discussion simulation
  - End-of-life care planning
- Psychological and spiritual support activities
  - Counseling sessions (role-play)
  - Grief and bereavement support discussion
- Home care and community care observation
- Caregiver education practice
- Documentation skills
  - Case sheet writing
  - Care plan preparation
  - Basic medical records in palliative care

CORE CLINICAL MEDICINE 2 (SYSTEM BASED)

L/T/P/C
2/-/2/4

LEARNING OBJECTIVES

1. To develop strong clinical understanding of renal, endocrine, neurological, hematological, infectious, and systemic diseases.
2. To apply structured clinical reasoning in diagnosis and management of common and complex medical conditions.
3. To interpret essential investigations such as ABG, electrolytes, ECG, imaging, and hematology profiles.
4. To recognize and manage medical emergencies including diabetic crises, stroke, sepsis, and shock.
5. To integrate multi-system knowledge for undifferentiated and critically ill patients.
6. To strengthen evidence-based clinical decision-making and patient-centered care approach.

LEARNING OUTCOMES

1. Students will be able to assess, diagnose, and manage renal, endocrine, neurological, hematological, and infectious diseases.
2. Students will demonstrate ability to recognize and respond to medical emergencies like DKA, stroke, sepsis, and shock.
3. Students will interpret laboratory and imaging investigations in clinical practice effectively.
4. Students will apply systematic approach in evaluating undiagnosed and multi-system disease patients.
5. Students will develop competency in clinical decision-making and prioritization in emergency settings.
6. Students will integrate theoretical knowledge into real-world clinical practice in hospital settings.

UNIT-1 (5 hours)

Renal & Electrolyte Disorders

- Acute kidney injury (AKI) – causes, diagnosis, management
- Chronic kidney disease (CKD) and complications
- Glomerular diseases overview
- Nephrotic vs nephritic syndrome
- Electrolyte imbalance:
    - Sodium, potassium, calcium disorders
- Acid–base disorders (metabolic & respiratory acidosis/alkalosis)
- Dialysis: indications and principles
- Fluid management in renal disease

UNIT-2 (5 hours)

Endocrine System

- Diabetes mellitus (Type 1 & 2) – complications & management
- Diabetic emergencies: DKA, HHS, hypoglycemia
- Thyroid disorders: hypo and hyperthyroidism
- Thyroid storm and myxedema coma
- Adrenal disorders: Addison's disease, Cushing's syndrome
- Pituitary disorders overview
- Approach to obesity and metabolic syndrome

UNIT-3 (5 hours)

Neurology System

- Approach to neurological examination
- Stroke: ischemic & hemorrhagic – acute management
- Seizure disorders and status epilepticus
- Meningitis and encephalitis
- Headache: migraine, tension, red flags
- Movement disorders: Parkinson's disease
- Peripheral neuropathy and neuromuscular disorders
- Spinal cord compression and paraplegia

UNIT-4 (5 hours)

Hematology & Oncology (Basic Clinical Medicine Level)

- Approach to anemia (microcytic, macrocytic, hemolytic)
- Bleeding disorders: hemophilia, thrombocytopenia
- Leukemia and lymphoma overview
- Coagulation profile interpretation
- Blood transfusion principles and reactions
- Approach to lymphadenopathy
- Basics of common cancers (lung, breast, GI)
- Paraneoplastic syndromes overview

UNIT-5 (5 hours)

Infectious Diseases & Systemic Illness

- Fever of unknown origin (FUO) approach
- Sepsis and septic shock (clinical approach)
- HIV infection and opportunistic infections
- Malaria, dengue, typhoid – clinical features & management
- Tuberculosis (extra-pulmonary focus + complications)
- Hospital-acquired infections

- Antibiotic principles and resistance (antimicrobial stewardship)
- Infective endocarditis overview (system integration)

UNIT-6 (5 hours)

Integrated Clinical Medicine & Emergency Thinking

- Approach to undiagnosed patient (syndromic approach)
- Multi-system organ failure (MODS)
- Shock: integrated clinical approach (all types)
- Acute breathlessness (cardiac vs respiratory vs metabolic)
- Chest pain differential diagnosis (cardiac + non-cardiac causes)
- Altered sensorium approach
- Polytrauma patient medical management basics
- Critical decision-making in undifferentiated emergencies

RECOMMENDED BOOKS

- **Harrison's Principles of Internal Medicine** (Latest Edition) – *Gold standard for clinical medicine*
- **Davidson's Principles and Practice of Medicine** – *Simple and exam-friendly clinical book*
- **Kumar & Clark's Clinical Medicine** – *System-based detailed understanding*

PRACTICAL (30 hours)

LEARNING OBJECTIVES

1. To develop clinical examination skills across renal, endocrine, neuro, hematology, and infectious disease systems.
2. To interpret basic laboratory investigations and ECG for clinical decision-making.
3. To recognize and manage common medical emergencies using structured clinical approach.

LEARNING OUTCOMES

1. Students will be able to perform systematic clinical examination and patient assessment independently.
2. Students will interpret investigations like ECG, ABG, CBC, and electrolytes in clinical scenarios.
3. Students will identify and initiate management for common medical and emergency conditions in hospital settings.

Patient history taking and complete clinical examination (system-based cases)

- General physical examination and systemic examination practice
- Interpretation of basic investigations:
  - CBC, LFT, RFT
  - Electrolytes
  - ABG analysis
  - Urine analysis
- ECG recording and basic interpretation (arrhythmia, MI patterns)
- Blood glucose monitoring and diabetic emergency recognition
- Neurological examination practice (cranial nerves, motor, sensory, reflexes)

- Stroke and seizure case assessment (simulation/OSCE)
- Renal case evaluation (AKI, CKD patient assessment)
- Fluid chart preparation and IV fluid management practice
- Acid-base disorder case-based interpretation
- Endocrine case discussion (DM, thyroid disorders, adrenal disorders)
- Emergency management drills:
  - DKA, HHS, hypoglycemia
  - Sepsis and shock recognition
- Hematology practical:
  - Anemia workup interpretation
  - Bleeding disorder evaluation
  - Blood transfusion procedure observation
- Infectious disease case studies:
  - TB, malaria, dengue, HIV cases
  - Antibiotic prescription practice (basic level)
- Oncology basics:
  - Cancer patient assessment
  - Lymph node examination
- Emergency medicine integration:
  - Chest pain evaluation
  - Breathlessness approach
  - Altered sensorium assessment
  - Trauma patient initial management

GERIATRICS

L/T/P/C
2/-/2/4

LEARNING OBJECTIVES

1. To understand the biological, psychological, and social aspects of aging and geriatric care principles.
2. To identify and manage common diseases and geriatric syndromes in elderly patients.
3. To develop skills in comprehensive assessment, rehabilitation, and end-of-life care in geriatric population.

LEARNING OUTCOMES

1. Students will be able to assess elderly patients using Comprehensive Geriatric Assessment (CGA).
2. Students will recognize and manage common geriatric syndromes and chronic diseases.
3. Students will apply holistic care including rehabilitation, palliative care, and ethical decision-making in elderly patients.

UNIT-1 (6 hours)

Introduction to Geriatric Medicine

- Definition and principles of geriatrics
- Demography and aging population trends
- Biological, psychological, and social aspects of aging
- Normal vs pathological aging
- Comprehensive Geriatric Assessment (CGA)

- Multidisciplinary team approach in geriatric care
- Ethical issues in elderly care

UNIT-2 (6 hours)

Common Medical Problems in Elderly

- Hypertension in elderly
- Diabetes mellitus in elderly
- Ischemic heart disease and heart failure in elderly
- COPD and respiratory disorders
- Osteoarthritis and osteoporosis
- Chronic kidney disease in elderly
- Polypharmacy and drug interactions

UNIT-3 (6 hours)

Geriatric Syndromes

- Frailty syndrome
- Falls and fall risk assessment
- Delirium and confusion states
- Dementia and cognitive impairment
- Urinary incontinence
- Pressure ulcers (bed sores)
- Malnutrition and dehydration

UNIT-4 (6 hours)

Neurological and Psychiatric Disorders in Elderly

- Stroke in elderly and rehabilitation
- Parkinson's disease and movement disorders
- Alzheimer's disease and other dementias
- Depression and anxiety in elderly
- Sleep disorders in aging
- Behavioral and psychological symptoms of dementia (BPSD)
- Neurocognitive assessment tools

UNIT-5 (6 hours)

Geriatric Emergencies, Rehabilitation & End-of-Life Care

- Geriatric emergency presentations (falls, fractures, acute confusion)
- Acute heart failure and respiratory distress in elderly
- Infection in elderly (atypical presentation)
- Rehabilitation medicine in geriatrics
- Palliative care in elderly
- End-of-life care and advance directives
- Social support systems and elder care laws

RECOMMENDED BOOKS

Core Books

- Hazzard's Geriatric Medicine and Gerontology – *Gold standard textbook*
- Oxford Textbook of Geriatric Medicine – *Comprehensive PG reference*
- Brocklehurst's Textbook of Geriatric Medicine – *Classic geriatrics book*

Clinical & Practical Books

- API Textbook of Medicine (Geriatrics sections)
- Davidson's Principles and Practice of Medicine (Elderly care chapters)
- Oxford Handbook of Geriatric Medicine – *Quick reference guide*

PRACTICAL (30 hours)

LEARNING OBJECTIVES

1. To develop skills in comprehensive assessment of elderly patients including physical, cognitive, and functional evaluation.
2. To identify and manage common geriatric syndromes like falls, dementia, frailty, and incontinence.
3. To understand medication safety, rehabilitation, and holistic care in elderly patients.

LEARNING OUTCOMES

1. Students will be able to perform Comprehensive Geriatric Assessment (CGA) independently.
2. Students will identify geriatric syndromes and plan basic management and prevention strategies.
3. Students will provide holistic elderly care including rehabilitation, counseling, and end-of-life support.

- Comprehensive Geriatric Assessment (CGA) practice
- History taking in elderly patients (medical, social, functional history)
- General physical examination of geriatric patients
- Functional assessment:
  - Activities of Daily Living (ADL)
  - Instrumental ADL (IADL)
- Cognitive assessment:
  - Mini Mental Status Examination (MMSE)
  - Dementia screening tools
- Gait and balance assessment
- Fall risk assessment and prevention strategies
- Assessment of common geriatric syndromes:
  - Delirium
  - Dementia
  - Frailty
  - Incontinence
  - Malnutrition
- Medication review and polypharmacy evaluation
- Blood pressure, diabetes, and chronic disease monitoring in elderly
- Pressure sore (bed sore) assessment and prevention care
- Basic wound care in elderly patients
- Rehabilitation exercises observation (physiotherapy basics)
- Mobility aids usage (walker, stick, wheelchair guidance)
- Counseling elderly patients and caregiver education
- End-of-life care discussion and advance care planning (simulation)

PREVENTIVE MEDICINE

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

LEARNING OBJECTIVES

1. To understand principles of disease prevention, epidemiology, and public health systems.
2. To develop skills in disease surveillance, screening, and control of communicable and non-communicable diseases.
3. To apply preventive strategies through national health programs, lifestyle modification, and community health practices.

LEARNING OUTCOMES

1. Students will be able to apply epidemiological methods to analyze disease patterns and risks.
2. Students will plan and implement preventive strategies for communicable and non-communicable diseases.
3. Students will participate in public health programs and promote community-based health interventions.

UNIT-1 (6 hours)

Principles of Preventive Medicine & Epidemiology

- Concepts of health, disease, and prevention (levels of prevention)
- Natural history of disease
- Epidemiological methods (descriptive, analytical, experimental studies)
- Measures of disease frequency (incidence, prevalence)
- Screening tests and screening programs
- Bias, confounding, and study design basics
- Evidence-based medicine principles

UNIT-2 (6 hours)

Biostatistics & Research Methods

- Basic statistical concepts
- Data collection and presentation
- Measures of central tendency and dispersion
- Probability and statistical inference
- Hypothesis testing (basic concepts)
- Correlation and regression basics
- Research methodology and clinical trials
- Ethical issues in research

UNIT-3 (6 hours)

Communicable Disease Control

- Chain of infection and disease transmission
- Immunization principles and national immunization programs
- Control of infectious diseases (TB, HIV, malaria, dengue)
- Outbreak investigation and surveillance
- Hospital infection control practices
- Antibiotic resistance and antimicrobial stewardship

- Isolation and quarantine principles

UNIT-4 (6 hours)

Non-Communicable Diseases & Lifestyle Medicine

- Epidemiology of NCDs (diabetes, hypertension, cancer, COPD)
- Risk factors and prevention strategies
- Screening programs for NCDs
- Tobacco, alcohol, and substance abuse prevention
- Nutrition and physical activity guidelines
- Obesity prevention and metabolic syndrome
- Mental health promotion and prevention

UNIT-5 (6 hours)

National Health Programs, Environmental & Occupational Health

- National Health Programs in India (NHM, NCD programs, TB program, etc.)
- Maternal and child health programs
- Family planning and reproductive health services
- Environmental health (air, water, sanitation)
- Occupational health hazards and prevention
- Disaster management and public health response
- Health education and community participation

RECOMMENDED BOOKS

- Park's Textbook of Preventive and Social Medicine – *Gold standard for India*
- Gordis Epidemiology – *Best for epidemiology basics*
- Rothman's Epidemiology – *Advanced reference (PG level)*

MEDICAL EDUCATION – I

L/T/P/C

Learning Objectives **1/-/1/2**

The student will be able to:

1. Achieve near-independent clinical competence in patient care.
2. Integrate knowledge from all clinical disciplines into holistic management.
3. Strengthen clinical reasoning, diagnostic accuracy, and decision-making.
4. Perform and assist in advanced clinical procedures under supervision.
5. Manage acute and chronic conditions effectively.
6. Demonstrate leadership in clinical settings and teamwork.
7. Uphold ethical practice, professionalism, and patient safety.

Learning Outcomes

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

1. Independently perform comprehensive patient evaluation.
2. Formulate definitive diagnosis and evidence-based management plans.
3. Interpret advanced investigations and clinical data.
4. Perform basic procedures independently and assist in advanced ones.
5. Manage emergency and critically ill patients (initial stabilization).
6. Present and defend cases during clinical discussions and rounds.
7. Demonstrate professionalism, leadership, and effective communication.

Syllabus (TOTAL HOURS:30 HOURS)

1. **Advanced Ward Posting (Independent Role)**

- Leading parts of ward rounds
- Monitoring and modifying patient management plans

2. **Comprehensive Clinical Assessment**
   - Complete history taking and system-based examination
   - Identification of complex clinical findings
3. **Case Presentation & Clinical Reasoning**
   - Detailed case presentations with justification
   - Formulating differential and final diagnosis
4. **Clinical Decision-Making & Management Planning**
   - Evidence-based treatment planning
   - Drug prescription under supervision
5. **Advanced Interpretation of Investigations**
   - ECG, imaging (X-ray, CT basics)
   - Lab data interpretation and clinical correlation
6. **Procedural Skills (Supervised Practice)**
   - IV access, catheterization, ABG sampling
   - Assisting in lumbar puncture, central line insertion, etc.
7. **Emergency & Critical Care Exposure**
   - Initial stabilization (BLS/ACLS principles)
   - Triage and emergency response
8. **Outpatient Department (OPD) Management**
   - Independent initial evaluation
   - Follow-up and chronic disease management
9. **Clinical Documentation & Audit**
   - Case sheets, discharge summaries
   - Participation in clinical audits and case reviews
10. **Leadership, Teaching & Teamwork**

- Supervising juniors (where applicable)
- Interprofessional collaboration
- Teaching basic clinical skills to peers

REFERENCE TEXTBOOKS

Core Books

1. Bates – *Guide to Physical Examination and History Taking*
2. Macleod's – *Clinical Examination*
3. Hutchison's – *Clinical Methods*

Supplementary Books

1. Oxford Handbook of Clinical Medicine
2. Davidson's – *Principles and Practice of Medicine*
3. Kumar & Clark – *Clinical Medicine*
4. Emergency & Critical Care Manuals (for practical exposure)

CARDIOVASCULAR AND THORACIC SURGERY

L/T/P/C

1/-/1/2

COURSE OBJECTIVES

After completion of this course, the student will be able to:

1. Understand the anatomy, physiology, and pathology of the cardiovascular and thoracic systems relevant to surgical practice.
2. Develop knowledge of common cardiac and thoracic diseases, diagnostic methods, and surgical management principles.
3. Gain competency in perioperative care, monitoring, and assistance during cardiovascular and thoracic surgical procedures.
4. Apply principles of critical care, infection control, and patient safety in cardiothoracic surgical settings.
5. Familiarize with advances in minimally invasive, robotic, and endovascular cardiothoracic procedures.

COURSE OUTCOMES

Upon successful completion of the course, students will be able to:

1. Explain the etiology, clinical presentation, diagnosis, and management of common cardiovascular and thoracic surgical conditions.
2. Perform patient assessment and assist in diagnostic, operative, and postoperative cardiothoracic procedures.
3. Demonstrate knowledge of perioperative monitoring, hemodynamic management, and intensive care support.
4. Identify and assist in the management of cardiothoracic emergencies and surgical complications.
5. Apply evidence-based approaches and multidisciplinary care in cardiovascular and thoracic surgery practice.

Theory Syllabus

Unit I – Introduction to Cardiovascular and Thoracic Surgery (3 hours)

- History and scope of cardiothoracic surgery
- Anatomy and physiology of the heart, lungs, and mediastinum
- Cardiothoracic surgical instrumentation and operation theatre setup
- Diagnostic investigations:
  - ECG
  - Echocardiography
  - Cardiac catheterization
  - Pulmonary function tests
  - CT and MRI imaging
- Principles of cardiopulmonary bypass
- Preoperative assessment and surgical risk evaluation

Unit II – Cardiovascular Surgical Disorders (3 hours)

- Coronary artery disease and coronary artery bypass grafting (CABG)
- Valvular heart diseases and valve surgery
- Congenital heart diseases and corrective procedures
- Aortic aneurysms and dissections
- Peripheral vascular and endovascular procedures
- Cardiac arrhythmias and surgical interventions
- Heart failure and ventricular assist devices
- Cardiac transplantation basics

Unit III – Thoracic Surgical Disorders (3 hours)

- Pleural diseases and thoracic drainage procedures
- Lung tumours and thoracic oncology surgery
- Pneumothorax and thoracic trauma
- Mediastinal disorders
- Esophageal surgical disorders

- Chest wall deformities and reconstruction
- Thoracotomy and video-assisted thoracoscopic surgery (VATS)
- Respiratory complications following thoracic surgery

Unit IV – Perioperative and Critical Care Management (3 hours)

- Preoperative preparation in cardiothoracic surgery
- Intraoperative monitoring and anaesthesia considerations
- Hemodynamic monitoring and ventilatory support
- Postoperative ICU care and recovery
- Fluid, electrolyte, and blood management
- Pain management and rehabilitation
- Infection prevention and wound care
- Recognition and management of postoperative complications

Unit V – Recent Advances and Specialized Procedures (3 hours)

- Minimally invasive cardiac and thoracic surgery
- Robotic-assisted cardiothoracic surgery
- Endovascular and hybrid procedures
- ECMO (Extracorporeal Membrane Oxygenation)
- Advances in cardiac imaging and diagnostics
- Enhanced Recovery After Surgery (ERAS)
- Artificial intelligence and digital technologies in cardiothoracic surgery
- Evidence-based updates and current trends in cardiovascular and thoracic surgery

Reference Textbooks

1. Sabiston and Spencer Surgery of the Chest – Frank W. Sellke, Pedro J. del Nido, Scott J. Swanson.
2. Kirklin/Barratt-Boyes Cardiac Surgery – David P. Taggart et al.
3. Shields' General Thoracic Surgery – Joseph LoCicero et al.
4. Bailey & Love's Short Practice of Surgery – Norman S. Williams et al.
5. Schwartz's Principles of Surgery – F. Charles Brunicardi et al.
6. Oxford Handbook of Cardiothoracic Surgery – Joanna Chikwe et al.
7. Textbook of Cardiovascular Medicine – Eric J. Topol.
8. Hurst's The Heart – Valentin Fuster et al.
9. General Thoracic Surgery Review and Assessment – Ali I. Musani et al.
10. Current Diagnosis & Treatment: Surgery – Gerard M. Doherty.

This course is designed to equip physician associate students with comprehensive knowledge of cardiovascular and thoracic surgical diseases, perioperative care, critical care management, and modern advancements in cardiothoracic surgery.

Practical Syllabus (15 hours)

1. Cardiovascular and respiratory system clinical examination
2. ECG recording and basic interpretation
3. Assisting in echocardiography and cardiac investigations
4. Preparation and assistance in cardiac catheterization procedures
5. Airway management and basic ventilatory support techniques
6. Assisting in chest tube insertion and management (ICD)
7. Preoperative preparation for cardiothoracic surgeries
8. Postoperative monitoring (vital signs, drains, hemodynamic parameters)
9. Infection control and wound care in cardiothoracic patients
10. Assisting in ICU care (ventilator monitoring, basic life support, emergency response)

CLINICAL POSTINGS

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

Learning Objectives

1. To develop competency in managing chronic, critically ill, and elderly patients using a holistic and patient-centered approach.
2. To gain hands-on experience in system-based clinical evaluation, palliative care, and geriatric assessment.
3. To enhance skills in clinical reasoning, communication, ethical decision-making, and preventive healthcare practices.

Learning Outcomes

1. Perform **comprehensive clinical assessment** including system-based, geriatric, and palliative evaluation.
2. Demonstrate ability to **recognize and manage chronic diseases, emergencies, and end-of-life conditions**.
3. Apply knowledge to **provide holistic care including rehabilitation, counseling, and preventive strategies**.

1. Palliative Care Posting (7 hours)

Focus Areas

- Holistic patient care (physical, psychological, social, spiritual)
- Pain and symptom management
- End-of-life care

Skills

- Pain assessment (VAS, NRS scales)
- Symptom assessment (dyspnea, nausea, fatigue)
- Communication skills:
    - Breaking bad news (SPIKES model)
    - Family counseling
- Comfort care:
    - Positioning, oral care, pressure sore prevention
- End-of-life care planning (DNR discussion – simulation)
- Case documentation and care planning

2. Core Clinical Medicine – II Posting (Renal, Endocrine, Neuro, Infectious) (7 hours)

Departments

- General Medicine
- Nephrology
- Neurology
- Endocrinology

Skills

- Complete history taking & systemic examination
- Interpretation of investigations:
    - CBC, LFT, RFT
    - Electrolytes

  - ABG analysis
- ECG recording & interpretation (basic)
- Clinical case discussions:
  - Diabetes, stroke, AKI, sepsis
- Emergency drills:
  - DKA, hypoglycemia
  - Sepsis and shock

3. Geriatric Medicine Posting (7 hours)

Focus Areas

- Comprehensive Geriatric Assessment (CGA)
- Geriatric syndromes
- Functional and cognitive evaluation

Skills

- ADL & IADL assessment
- Cognitive tests (MMSE)
- Fall risk and gait assessment
- Pressure sore assessment & care
- Polypharmacy review
- Counseling elderly patients & caregivers
- Rehabilitation basics and mobility aids

4. Infectious Disease & Public Health Posting (6 hours)

Focus Areas

- Communicable diseases
- Infection control practices
- National health programs

Skills

- Case evaluation:
  - Tuberculosis, dengue, malaria
- Isolation precautions & PPE use
- Immunization practices
- Outbreak awareness
- Antibiotic stewardship basics

5. Emergency Integration Posting (6 hours)

Focus Areas

- Medical emergencies related to systemic diseases

Skills

- Acute case handling:
  - Stroke assessment
  - Altered sensorium
  - Breathlessness
- Shock identification and management
- Rapid clinical decision-making

6. Oncology & Hematology Exposure (6 hours)

Focus Areas

- Cancer patient care
- Blood disorders

Skills

- Lymph node examination
- Anemia workup interpretation
- Blood transfusion observation
- Basic oncology patient assessment

7. Preventive & Community Medicine Posting (6 hours)

Focus Areas

- Community health and disease prevention

Skills

- Screening programs (BP, diabetes)
- Health education sessions
- Nutritional assessment
- Participation in national health programs
- Field visits (if applicable)

SEMESTER – IV

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1		**Core Clinical Medicine III (systems based)**	2	-	2	4	40	60	100
2		**Consents and Medico legal issues**	2	-	-	2	40	60	100
3		**Rehabilitative Medicine**	2	-	-	2	40	60	100
4		**Medical Education-II**	2	-	1	3	40	60	100
5		**Neurosurgery**	1	-	1	2	40	60	100
6		**Clinical posting**	-	-	4	4	40	60	100
7		**Thesis/Research Project**	-	-	3	3	40	60	100
TOTAL			**9**		**11**	**20**	**280**	**420**	**700**

CORE CLINICAL MEDICINE 3 (SYSTEM BASED)

L/T/P/C
2/-/2/4

LEARNING OBJECTIVES

1. To develop advanced clinical understanding of critical care, emergency medicine, and multi-system diseases in severely ill patients.
2. To strengthen clinical decision-making skills in ICU, emergency, oncology, infectious diseases, neurology, and geriatric care.
3. To apply evidence-based medicine in the management of complex and life-threatening medical conditions with ethical practice.

LEARNING OUTCOMES

1. Students will be able to assess and manage critically ill patients using structured ICU and emergency approaches (ABCDE, shock management, sepsis care).
2. Students will demonstrate clinical reasoning in multi-system diseases including cardiac, respiratory, neurological, hematological, and infectious emergencies.
3. Students will integrate palliative care, geriatric care, and ethical decision-making in advanced clinical practice.

UNIT-1 (6 hours)

Critical Care & Emergency Clinical Medicine

- Approach to critically ill patient (ABCDE, ICU thinking)
- Shock states and resuscitation (septic, cardiogenic, hypovolemic)
- Sepsis and MODS (multi-organ dysfunction syndrome)
- Acute respiratory failure and oxygen/ventilation support basics
- Cardiac arrest management and post-resuscitation care
- Acid–base and metabolic emergencies in ICU

UNIT-2 (6 hours)

Cardio-Respiratory Advanced Medicine

- Acute coronary syndrome complications and management
- Advanced heart failure and decompensation
- Hypertensive emergencies and resistant hypertension
- Pulmonary embolism and pulmonary hypertension
- ARDS (acute respiratory distress syndrome)
- Advanced respiratory failure and ventilator-related issues

UNIT-3 (6 hours)

Neurology & Psychiatric Clinical Emergencies

- Coma and altered sensorium approach
- Stroke complications and neurocritical care
- Status epilepticus management
- Neuromuscular emergencies (Myasthenia crisis, paralysis)
- Neurodegenerative diseases (advanced Parkinson’s, dementia)
- Psychiatric emergencies (psychosis, suicide risk, agitation)

UNIT-4 (6 hours)

Oncology, Hematology & Palliative Integration

- Approach to cancer patient in clinical practice
- Oncological emergencies (tumor lysis, spinal cord compression)
- Cancer complications (pain, infection, cachexia)
- Basics of chemotherapy complications (clinical awareness)
- Hematological emergencies (severe anemia, bleeding disorders)
- Palliative care integration in chronic and terminal illness

UNIT-5 (6 hours)

Infectious Diseases, Geriatrics & Clinical Decision Making

- Sepsis syndromes and severe infections
- HIV advanced disease and opportunistic infections
- Tropical infections and emerging diseases
- Hospital-acquired infections and antibiotic resistance
- Geriatric medicine (frailty, delirium, polypharmacy, falls)
- Clinical reasoning in complex multi-system diseases
- Evidence-based medicine and clinical decision making
- Ethical issues in advanced and end-stage care

RECOMMENDED BOOKS

- Harrison's Principles of Internal Medicine – *Gold standard PG textbook*
- Davidson's Principles and Practice of Medicine – *Clinical clarity and exam oriented*
- Kumar & Clark's Clinical Medicine – *System-based detailed learning*

PRACTICAL (30 hours)

LEARNING OBJECTIVES

1. To develop advanced clinical skills in managing critically ill and emergency patients using ICU-based approach.
2. To improve ability in interpreting investigations like ECG, ABG, and clinical data in multi-system diseases.
3. To strengthen clinical decision-making in emergency, oncology, infectious, neurological, and geriatric cases.

LEARNING OUTCOMES

1. Students will be able to assess and stabilize critically ill patients using structured ICU protocols.
2. Students will demonstrate competency in interpreting emergency investigations and recognizing life-threatening conditions.
3. Students will apply clinical reasoning to manage complex multi-system and emergency medical cases effectively.

- ICU patient assessment using **ABCDE approach**
- Monitoring critically ill patients (BP, SpO_2, ECG, vitals)
- Recognition and initial management of **shock states**
- Basic life support and emergency resuscitation practice (CPR, post-arrest care)

- Oxygen therapy methods and ventilator basics (demo/observation)
- ABG sample interpretation (acid–base disorders cases)
- Sepsis identification and emergency management drills
- Cardio-respiratory case evaluation:
  - Acute coronary syndrome cases
  - Heart failure assessment
  - ARDS and respiratory failure cases
- ECG interpretation in emergency conditions (MI, arrhythmias)
- Neurology clinical skills:
  - Coma and GCS assessment
  - Stroke evaluation
  - Seizure emergency management
- Psychiatric emergency handling (agitation, suicide risk simulation)
- Oncology case discussion:
  - Cancer patient assessment
  - Oncological emergency recognition
- Hematology practical:
  - Bleeding disorders evaluation
  - Severe anemia case interpretation
  - Transfusion reaction awareness
- Infectious disease case workup:
  - HIV, TB, malaria, dengue cases
  - Sepsis and hospital infection cases
- Geriatric assessment:
  - Frailty, delirium, fall risk evaluation
  - Polypharmacy review
- Clinical decision-making:
  - Multi-system case discussions
  - Ethical case-based scenarios

CONSENTS & MEDICO-LEGAL ISSUES

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

LEARNING OBJECTIVES

1. To understand legal and ethical principles governing medical practice and patient care.
2. To develop skills in obtaining valid consent and proper medico-legal documentation.
3. To identify medico-legal cases and apply appropriate legal procedures in clinical practice.

LEARNING OUTCOMES

1. Students will be able to obtain and document valid informed consent in clinical practice.
2. Students will recognize medico-legal cases and follow proper reporting procedures.
3. Students will apply legal and ethical principles in decision-making and patient management.

UNIT-1 (6 hours)

Fundamentals of Consent in Medical Practice

- Definition and importance of consent in healthcare
- Types of consent: informed, implied, expressed, written
- Elements of valid consent (capacity, information, voluntariness)
- Competency and decision-making capacity assessment
- Consent in emergency situations
- Role of physician associate in obtaining consent
- Documentation of consent

UNIT-2 (6 hours)

Legal Framework in Medical Practice

- Overview of Indian medical legal system
- Indian Penal Code (relevant medical sections)
- Consumer Protection Act and medical negligence
- Clinical Establishments Act basics
- Professional conduct and ethics (NMC guidelines)
- Patient rights and doctor responsibilities
- Confidentiality and data protection

UNIT-3 (6 hours)

Medical Negligence and Liability

- Definition and components of medical negligence
- Types of negligence (civil, criminal, ethical)
- Standard of care and duty of care
- Doctrine of res ipsa loquitur
- Vicarious liability in healthcare settings
- Defenses in medical negligence cases
- Case examples and judgments overview

UNIT-4 (6 hours)

Medico-Legal Cases (MLC) & Documentation

- Definition and types of medico-legal cases
- Role of doctor/PA in MLC reporting
- Injury documentation and examination
- Death certification and post-mortem procedures
- Accident, poisoning, assault, and trauma cases
- Proper medical record keeping
- Legal importance of clinical documentation

UNIT-5 (6 hours)

Ethical Issues & Special Medico-Legal Situations

- Medical ethics principles (autonomy, beneficence, non-maleficence, justice)
- End-of-life care, DNR, euthanasia (legal aspects)
- Organ donation and transplantation laws
- Consent in minors and mentally ill patients
- Sexual assault examination and legal protocol
- Workplace violence and doctor protection laws
- Emerging issues: telemedicine and digital consent

RECOMMENDED BOOKS

1. Modi's Textbook of Medical Jurisprudence & Toxicology
2. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine & Toxicology
3. RK Sharma – Medico-Legal Aspects of Patient Care

REHABILITATIVE MEDICINE

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

LEARNING OBJECTIVES

1. To understand principles and scope of rehabilitation medicine across physical, neurological, and chronic conditions.
2. To develop skills in functional assessment and rehabilitation planning for patients with disability.
3. To integrate multidisciplinary approaches for improving patient independence and quality of life.

LEARNING OUTCOMES

1. Students will be able to assess disability and functional limitations using standardized tools.
2. Students will design basic rehabilitation plans for musculoskeletal, neurological, and chronic disease patients.
3. Students will apply multidisciplinary and community-based approaches to improve patient recovery and quality of life.

UNIT-1 (6 hours)

Introduction to Rehabilitation Medicine

- Definition and principles of rehabilitation
- Concept of disability, impairment, and handicap (ICF model)
- Types of rehabilitation (medical, physical, vocational, social)
- Multidisciplinary rehabilitation team and roles
- Goals of rehabilitation medicine
- Levels of prevention in rehabilitation
- Ethics in rehabilitation care

UNIT-2 (6 hours)

Musculoskeletal & Orthopedic Rehabilitation

- Fracture rehabilitation principles
- Joint injuries and post-operative rehabilitation
- Osteoarthritis and rheumatoid arthritis rehabilitation
- Amputation and prosthetic training
- Spine disorders and back pain rehabilitation
- Sports injuries and rehabilitation protocols
- Pain management in musculoskeletal conditions

UNIT-3 (6 hours)

Neurological Rehabilitation

- Stroke rehabilitation (acute, subacute, chronic phases)
- Spinal cord injury rehabilitation
- Traumatic brain injury rehabilitation
- Cerebral palsy rehabilitation
- Parkinson's disease and movement disorder rehabilitation
- Peripheral nerve injury rehabilitation
- Spasticity management and mobility training

UNIT-4 (6 hours)

Cardiopulmonary & Medical Rehabilitation

- Cardiac rehabilitation after MI and heart failure
- Pulmonary rehabilitation (COPD, asthma, post-COVID)
- Exercise tolerance and fitness training
- Energy conservation techniques
- Chronic disease rehabilitation (diabetes, CKD)
- ICU and post-critical illness rehabilitation

UNIT-5 (6 hours)

Community, Geriatric & Vocational Rehabilitation

- Geriatric rehabilitation (falls, frailty, functional decline)
- Pediatric rehabilitation (developmental disorders)
- Vocational rehabilitation and return-to-work programs
- Assistive devices and mobility aids (wheelchair, walker, orthotics)
- Community-based rehabilitation (CBR)
- Rehabilitation counseling and patient education
- Quality of life assessment tools

RECOMMENDED BOOKS

- Braddom's Physical Medicine and Rehabilitation – *Gold standard PG textbook*
- DeLisa's Physical Medicine and Rehabilitation – *Comprehensive reference*
- O'Sullivan & Schmitz – Physical Rehabilitation – *Clinical approach focus*

MEDICAL EDUCATION – IV **L/T/P/C**
2/-/1/3

Learning Objectives

The student will be able to:

1. Achieve independent clinical competence in patient care.
2. Integrate knowledge, skills, and attitudes for holistic patient management.
3. Perform clinical decision-making with minimal supervision.
4. Manage emergency, acute, and chronic conditions effectively.
5. Demonstrate leadership, teamwork, and coordination in healthcare settings.
6. Ensure patient safety, ethical practice, and quality care delivery.
7. Prepare for transition into professional clinical practice.

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

1. Independently conduct comprehensive patient evaluation and management.
2. Formulate and implement diagnosis and treatment plans.
3. Perform essential clinical procedures confidently.
4. Manage emergencies and stabilize critically ill patients.
5. Interpret clinical data, investigations, and imaging accurately.
6. Communicate effectively with patients, families, and healthcare teams.
7. Demonstrate professionalism, accountability, and leadership skills.

SYLLABUS (TOTAL HOURS:45 HOURS)

1. **Internship-Level Ward Responsibilities**
    - Independent patient care under supervision
    - Daily rounds, monitoring, and updating treatment plans
2. **Comprehensive Case Management**
    - Full evaluation, diagnosis, treatment, and follow-up
    - Managing multiple patients simultaneously
3. **Advanced Case Presentation**
    - Detailed and structured case discussions
    - Clinical reasoning and justification of management
4. **Independent Clinical Decision-Making**
    - Evidence-based treatment planning
    - Rational drug prescription
5. **Procedural Competency**
    - IV cannulation, catheterization, suturing
    - ABG sampling, basic airway management
    - Assisting advanced procedures
6. **Emergency & Critical Care Management**
    - Initial stabilization (BLS/ACLS principles)
    - Triage and rapid decision-making
7. **OPD & Follow-Up Care**
    - Independent patient evaluation
    - Chronic disease management and counseling
8. **Interdisciplinary Collaboration**
    - Working with doctors, nurses, therapists
    - Coordinating patient care
9. **Clinical Documentation & Legal Aspects**
    - Case sheets, discharge summaries
    - Consent, medico-legal awareness
10. **Leadership, Teaching & Professional Development**

- Supervising junior students
- Teaching basic skills
- Time management and ethical practice

REFERENCE TEXTBOOKS

Core Books

1. Bates – *Guide to Physical Examination and History Taking*

2. Macleod's – *Clinical Examination*
3. Hutchison's – *Clinical Methods*

Supplementary Books

1. Oxford Handbook of Clinical Medicine
2. Davidson's – *Principles and Practice of Medicine*
3. Kumar & Clark – *Clinical Medicine*
4. Emergency & Critical Care Manuals

NEUROSURGERY

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

COURSE OBJECTIVES

After completion of this course, the student will be able to:

1. Understand the anatomy, physiology, and pathology of the central and peripheral nervous systems relevant to neurosurgical practice.
2. Develop knowledge of common neurosurgical disorders, diagnostic modalities, and management principles.
3. Gain competency in neurological assessment, perioperative care, and assistance during neurosurgical procedures.
4. Apply principles of neurocritical care, patient safety, infection prevention, and rehabilitation in neurosurgical settings.
5. Familiarize with recent advances in microsurgery, minimally invasive neurosurgery, neuroimaging, and neurotechnology.

COURSE OUTCOMES

Upon successful completion of the course, students will be able to:

1. Explain the etiology, clinical features, diagnosis, and management of common neurosurgical conditions.
2. Perform neurological evaluation and assist in diagnostic and therapeutic neurosurgical procedures.
3. Demonstrate knowledge of perioperative and postoperative care of neurosurgical patients.
4. Identify neurosurgical emergencies and participate in emergency stabilization and critical care management.
5. Apply evidence-based and multidisciplinary approaches in neurosurgical patient care.

Theory Syllabus

Unit I – Introduction to Neurosurgery **(3 hours)**

- History and scope of neurosurgery
- Functional neuroanatomy and neurophysiology
- Neurological history taking and examination
- Principles of neuroimaging:
  - CT scan
  - MRI
  - Angiography
  - Functional imaging
- Neurosurgical instrumentation and operating room setup
- Sterilization, infection control, and patient safety
- Principles of neurocritical care

Unit II – Cranial Neurosurgery **(3 hours)**

- Traumatic brain injury and head trauma
- Intracranial hematomas:
  - Epidural hematoma
  - Subdural hematoma
  - Intracerebral haemorrhage
- Brain tumours and principles of surgical oncology
- Hydrocephalus and CSF diversion procedures
- Cerebrovascular disorders:
  - Aneurysms
  - Arteriovenous malformations
- Raised intracranial pressure and cerebral oedema
- Cranial surgical procedures and postoperative care

Unit III – Spinal Neurosurgery **(3 hours)**

- Anatomy and physiology of the spinal cord and vertebral column
- Degenerative spine disorders
- Intervertebral disc prolapses and spinal stenosis
- Spinal trauma and spinal cord injury
- Spinal tumours and infections
- Congenital spinal anomalies
- Principles of spinal stabilization and instrumentation
- Rehabilitation following spinal surgery

Unit IV – Peripheral Nerve and Functional Neurosurgery **(3 hours)**

- Peripheral nerve injuries and repair
- Entrapment neuropathies
- Trigeminal neuralgia and facial pain syndromes
- Epilepsy surgery
- Functional neurosurgery and movement disorders
- Deep brain stimulation (DBS)
- Stereotactic and radio surgical procedures
- Neurophysiological monitoring in surgery

Unit V – Recent Advances and Specialized Neurosurgery **(3 hours)**

- Microsurgical techniques and operating microscope
- Endoscopic neurosurgery
- Minimally invasive spine surgery
- Neuronavigation and image-guided surgery
- Robotic-assisted neurosurgery
- Neurointensive care and advanced monitoring
- Artificial intelligence and digital technologies in neurosurgery
- Evidence-based neurosurgical practices and recent updates

Reference Textbooks

1. Youmans and Winn Neurological Surgery – H. Richard Winn.
2. Greenberg's Handbook of Neurosurgery – Mark S. Greenberg.
3. Schmidek and Sweet: Operative Neurosurgical Techniques – Alfredo Quiñones-Hinojosa.
4. Principles of Neurological Surgery – Richard G. Ellenbogen et al.
5. Adams and Victor's Principles of Neurology – Allan H. Ropper et al.
6. Merritt's Neurology – Elan D. Louis, Stephan A. Mayer.
7. Clinical Neuroanatomy – Richard S. Snell.
8. Bailey & Love's Short Practice of Surgery – Norman S. Williams et al.
9. Oxford Handbook of Neurology – Hadi Manji et al.
10. Handbook of Neurosurgery – Mark S. Greenberg.

This course is designed to provide physician associate students with comprehensive knowledge of

neurosurgical disorders, perioperative management, neurocritical care, and modern neurosurgical technologies required for multidisciplinary neurosurgical practice.

Practical Syllabus **(15 hours)**

1. Neurological history taking and detailed clinical examination
2. Assessment of Glasgow Coma Scale (GCS) and level of consciousness
3. Assisting in neuroimaging procedures (CT, MRI basics interpretation)
4. Preoperative preparation of neurosurgical patients
5. Assisting in neurosurgical procedures (cranial and spinal surgeries)
6. Monitoring of intracranial pressure (ICP) and neurological status
7. Postoperative care (neuro-observation, wound and drain care)
8. Basic management of neurosurgical emergencies (head injury, seizures)
9. Infection control and aseptic techniques in neurosurgery
   Rehabilitation support and patient counselling in neurological conditions

CLINICAL POSTINGS

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

Learning Objectives

1. To develop advanced competency in critical care, emergency medicine, and multi-system disease management.
2. To gain practical exposure in ICU care, oncology, infectious diseases, rehabilitation, and medico-legal practices.
3. To enhance clinical decision-making, ethical reasoning, and patient-centered care in complex clinical scenarios.

Learning Outcomes

1. Perform advanced assessment and stabilization of critically ill patients using ICU and emergency protocols.
2. Demonstrate clinical reasoning and procedural skills in managing multi-system and life-threatening conditions.
3. Apply knowledge of rehabilitation, palliative integration, and medico-legal principles in clinical practice.

1. Intensive Care Unit (ICU) Posting (7 hours)

Focus Areas

- Critically ill patient management
- Shock, sepsis, MODS
- Ventilator and monitoring support

Skills

- ABCDE assessment in ICU patients
- Monitoring (ECG, BP, SpO_2, vitals)
- Recognition of shock types & initial management
- Oxygen therapy & ventilator basics (observation)
- ABG interpretation (acid–base disorders)
- Post-resuscitation care observation

2. Emergency & Acute Care Posting (7 hours)

Focus Areas

- Emergency stabilization
- Cardiac and respiratory emergencies

Skills

- CPR and basic life support
- Acute coronary syndrome assessment
- Arrhythmia recognition (basic ECG)
- Stroke and seizure emergency handling
- Acute breathlessness evaluation
- Rapid clinical decision-making

3. Cardio-Respiratory Advanced Medicine Posting (7 hours)

Departments

- Cardiology
- Pulmonology

Skills

- Heart failure assessment
- Hypertensive emergency management
- Pulmonary embolism awareness
- ARDS case observation
- ECG interpretation (MI, arrhythmias)
- Oxygen and respiratory support methods

4. Neurology & Psychiatric Emergency Posting (7 hours)

Focus Areas

- Neurological emergencies
- Mental health crisis management

Skills

- GCS scoring and coma assessment
- Stroke evaluation and referral
- Seizure management (initial care)
- Neurological examination
- Psychiatric emergency handling:
    - Agitation
    - Suicide risk assessment

5. Oncology & Hematology Posting (7 hours)

Focus Areas

- Cancer care and complications
- Blood disorders

Skills

- Cancer patient clinical assessment
- Identification of oncological emergencies
- Anemia and bleeding disorder evaluation
- Blood transfusion observation
- Chemotherapy complication awareness

6. Infectious Disease & Sepsis Care Posting (7 hours)

Focus Areas

- Severe infections and hospital-acquired infections

Skills

- Sepsis recognition and early management
- Case workup:
  - HIV, TB, dengue, malaria
- Infection control practices
- Antibiotic stewardship basics

7. Geriatric Advanced Care Posting (6 hours)

Focus Areas

- Complex elderly care

Skills

- Frailty and delirium assessment
- Fall risk evaluation
- Polypharmacy review
- Functional and cognitive assessment

8. Rehabilitation Medicine Posting (6 hours)

Focus Areas

- Functional recovery and disability management

Skills

- Functional assessment (ADL, mobility)
- Rehabilitation planning (basic level)
- Mobility aids usage (walker, wheelchair)
- Stroke and spinal injury rehab observation
- Patient and caregiver education

9. Medico-Legal & Documentation Posting (6 hours)

Focus Areas

- Legal and ethical clinical practice

Skills

- Informed consent taking & documentation
- Identification of medico-legal cases (MLC)
- Injury documentation basics
- Medical record maintenance
- Ethical case discussions

THESIS / RESEARCH PROJECT

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

Learning Objectives

1. To develop the ability to design, conduct, and analyse a clinical or community-based research study using scientific methodology.
2. To enhance skills in critical thinking, data interpretation, and evidence-based medical practice.

Learning Outcomes

1. Students will be able to conduct a structured research project, including literature

review, data collection, analysis, and report writing.

2. Students will demonstrate the ability to interpret research findings and present them scientifically through thesis writing and presentation.