(15)

# SYLLABUS

# BACHELOR IN ORTHOPEDIC TECHNOLOGY

## 4 Years (VIII Semesters)

**(3 Years+1 Year (VII-VIII Semester) Internship)**

# BACHELOR OF ORTHOPEDIC TECHNOLOGY

**Learning Objectives:**

At the end of the B.Sc. in Orthopaedic Technology course, the student should be able to:

1) Test patients for bone related issues.
2) Understand care of patients suffering from musculoskeletal disorders.
3) Use and maintain medical equipment and machines used in the field.
4) Apply basic and advanced life support skills.
5) Study emergency invasive procedures that could save an individual's life.
6) Assist in various orthopedic surgical procedures.
7) Learn about fracture and plasters techniques.
8) Observe the correct way to perform surgical procedures before applying practical skills.

**Expectations from the future graduate in providing patient care**

The goal of B.Sc. in OrthopedicTechnology course is to produce a competent orthopedictechnician who:

1) Are trained to assist interventional orthopedics in performing diagnostic and therapeutic invasive orthopedic procedures with the help of orthopedic imaging.
2) Are trained to assist doctors during procedures such as orthopedic imaging including X-ray, MRI, CT-scan etc., sutures, surgery, first aid procedure.
3) Also, be able to interpret basic diagnosis, surgical procedure.
4) Understand orthopaedic surgical procedures equipment, basic trauma handling, operationroomtechniques.
5) Understand programming of orthopedics instruments and other surgicalinstruments.

| SEMESTER –I | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Category** | **Paper Title** | Credits | Contact per week | | | Evaluation | | |
| | | | | L | T | P | Internal | External | Total |
| | Core | Human Anatomy | 4 | 3 | 1 | - | 20 | 80 | 100 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Core | Human Physiology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | General Biochemistry | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Medical Ethics & Computer Skills related to Orthopedic Technology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Ability Enhancement Course | Environmental Science and Health | 2 | 2 | | | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses offered by Institute/ College/University. | 2 | 2 | | | 20 | 80 | 100 |
| **Total Credit- 25** | | | **Total Contact Hours- 30** | | | | | | |
| ***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective** | | | | | | | | | |

| **SEMESTER –II** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Category** | **Paper Title** | Credits | Contact per week | | | Evaluation | | |
| | | | | L | T | P | Internal | External | Total |
| | Core | General Microbiology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | General Pathology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | General Pharmacology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | General Orthopedics | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Skill Enhancement Course | Medical terminology and Record keeping | 2 | 2 | | | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses | 2 | 2 | | | 20 | 80 | 100 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | offered by Institute/ College/University. | | | | | | | |
| **Total Credit- 25** | | | **Total Contact Hours- 30** | | | | | | |
| ***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective** | | | | | | | | | |

**SEMESTER –III**

| **Course Code** | **Course Category** | **Paper Title** | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Orthopedic Instruments & Its Maintenance | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | First Aid Procedures | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Deformities: Congenital & Acquired | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Trauma in Orthopedics | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Discipline Specific Elective | General Principles and Practices of Public Health/ Forensic Psychology | 2 | 2 | - | - | 20 | 80 | 100 |
| | Ability Enhancement Course | Computer/BASIC EMERGENCY MANAGEMENT | 2 | 2 | - | - | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses offered by Institute/ College/University. | 2 | 2 | - | - | 20 | 80 | 100 |
| **Total Credit- 27** | | | **Total Contact Hours- 32** | | | | | | |
| ***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective** | | | | | | | | | |

**/General Elective**

| SEMESTER –IV | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Category** | **Paper Title** | Credits | Contact per week | | | Evaluation | | |
| | | | | L | T | P | Internal | External | Total |
| | Core | Plaster Technology – I | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Operation Room Techniques - I | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Common Orthopedic Procedures – I | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Environmental & Biomedical Waste Management; entrepreneurship and professional management | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Discipline Specific Elective | Communication skill for Health care professional/ introduction to national healthcare system | 3 | 3 | - | | 20 | 80 | 100 |
| | Skill Enhancement Course | MEDICAL LAW/ Ethics in public health | 2 | 2 | - | - | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses offered by Institute/ College/University. | 2 | 2 | - | - | 20 | 80 | 100 |
| **Total Credit- 28** | | | **Total Contact Hours- 33** | | | | | | |
| ***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective** | | | | | | | | | |

## SEMESTER –V

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Plaster Technology – II | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Operation Room Techniques - II | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Common Orthopedic Procedures – II | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Immunology | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Discipline Specific Elective | Medical psychology/ Biostatics and Research methodology | 3 | - | - | 3 | 20 | 80 | 100 |
| | Ability Enhancement | Entrepreneurship development/ Introduction to quality and patient safety | 2 | - | - | 2 | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses offered by Institute/ College/University. | 2 | 2 | - | 2 | 20 | 80 | 100 |
| **Total Credit- 28** | | | **Total Contact Hours- 33** | | | | | | |

***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective**

## SEMESTER –VI

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Physiotherapy in Orthopedics | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Biomechanics in Orthopedics | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Plaster room ethics | 4 | 3 | 1 | - | 20 | 80 | 100 |
| | Core | Professionalism and values | 4 | 3 | 1 | - | 20 | 80 | 100 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Practical | Practical for all subjects / Clinical Posting | 5 | - | - | 10 | 50 | 150 | 200 |
| | Discipline Specific Elective | HOSPITAL MANAGEMENT/ Basics of clinical Skill Learning | 3 | 3 | - | | 20 | 80 | 100 |
| | Skill Enhancement Course | BASIC AND ADVANCE LIFE SUPPORT/ ORGANIZATIONAL BEHAVIOUR | 2 | 2 | | | 20 | 80 | 100 |
| | *Generic Elective | *Students have to opt any one of the open elective courses offered by Institute/ College/University. | 2 | 2 | | | 20 | 80 | 100 |
| **Total Credit- 28** | | | **Total Contact Hours- 33** | | | | | | |
| ***Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective** | | | | | | | | | |

| SEMESTER – VII& VIII INTERNSHIP | | | | |
|---|---|---|---|---|
| **Subject Code** | **Course category** | **Course title** | Evaluation | |
| | | | Internal | External |
| | Core | Internship | 40 | 60 |
| | Core | Internship | 40 | 60 |
| **Internship is for 12 months** | | | | |

| SEMESTER | CREDIT |
|---|---|
| I | 25 |
| II | 25 |
| III | 27 |
| IV | 28 |
| V | 28 |
| VI | 28 |
| VII | 20 |
| VIII | 20 |
| **TOTALCREDITS** | **201** |

**Exit: Honours' Orthopedic Technology**

## SEMESTER-1

## HUMAN ANATOMY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Human Anatomy | 4 | 3 | 1 | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describe the anatomy & terminology of cell, tissues of body Skin & its Blood supply. | Remember |
| 2 | Explain the blood circulation system & skeleton system with Classification of bones, Parts of developing long bone. | Understand |
| 3 | Determine the muscular system, Muscles of Upper limb, Muscles of lower limb, Muscles of Neck, Muscles of back & joints. | Apply |
| 4 | Analyse the respiratory system with Bronchopulmonary segments & circulatory system: Types of blood vessels, Heart& Pericardium. | Analyze |
| 5 | Assess the digestive system, role of digestive juices & enzymes & reproductive system: spermatogenesis & oogenesis. | Evaluate |
| 6 | Formulate the excretory system Pathway of glomerulus filtration rate with structure & structure of nephrons. | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

| | |
|---|---|
| **Learning Outcomes** | 1. To introduce the students to the concepts related to General anatomy, Muscular, Respiratory, Circulatory, Digestive and Excretory system<br>2. Demonstrate and understand the basic anatomy of Respiratory and Circulatory system<br>3. Demonstrate and understand the basic anatomy of Digestive and Excretory system<br>4. Knowledge of basic concept of human body anatomical structure. |

| | |
|---|---|
| | 5. Knowledge of interrelationships, gross, functional and applied anatomy of various structures in the human body. |

**UNIT-I**

1. Introduction to anatomy,anatomical terms, planes, organization of human body- cell, tissue, organ and organ system.
2. Musculo-skeletal system:
   Types of bones, structure & divisions of the skeleton system, name of all the bones and their parts, joints- classification. Structure and types of muscles
3. Anatomy of the Nervous system
   Central nervous system & Peripheral nervous system- different components

**UNIT-II**

1. Anatomy of Circulatory system:
   General plan of circulatory system and its components.
2. Heart- size, location, coverings, chambers, blood supply, nerve supply, the blood vessels
   General plan of circulation, pulmonary circulation
3. Name of arteries and veins and their positions Lymphatic system - general plan Anatomy of the Respiratory system:
   Organs of Respiratory System (Brief knowledge of parts and position)

**UNIT-III**

1. Anatomy of the Digestive system:
2. Anatomy of alimentary tract; Parts of the tract
3. Accessory glands of digestion; Pancreas, Liver, Gall Bladder
4. Anatomy of Excretory system Kidneys- location, gross structure, excretory ducts, ureters, urinary bladder, urethra

**UNIT-IV**

1. Reproductive system: Male Reproductive System, Female Reproductive System

**UNIT-V**

1. Anatomy of the endocrine system: Name of all endocrine glands their positions
2. Hormones and their functions- Pituitary, Pituitary, Thyroid, Parathyroid, Adrenal glands, Gonads & Islets of pancreas

**PRACTICALS**

1. Demonstration of parts of microscope and its uses
2. Demonstration of skeleton and joints.
3. Demonstration of deltoid and gluteus maximus, Cubital fossa.
4. Clinical Examination of Arterial Pulse
5. Demonstration of body temperature.

**Reference Books:**

a. Human Anatomy Regional and Applied Vol. 1, Vol.2 & Vol.3, B.D.ChaurasiaC.B.S.Publishers, New Delhi- 9th edition -2022
2. Hand Book of General Anatomy B.D.Chaurasia, C.B.S.Publishers, New Delhi-9th edition -2022
3. Text Book of Human Histology Inderbir Singh, Jaypee Brothers, Medical
4. Publishers, Delhi -7th edition - 2021
5. Gray's Anatomy Susan Standring, Elsevier Churchill Livingstone, Edinburg – 42nd edition- 2021

| Course Code | Course Category | Paper Title | Credits | Contact per week | Evaluation |
|---|---|---|---|---|---|

| | | | | L | T | P | Internal | External | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Core | Human Physiology | 4 | 3 | 1 | - | 20 | 80 | 100 |

# HUMAN PHYSIOLOGY

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describe the basic physiology of hematology, Homeostasis, Hemopoiesis, Hemogram, Anemia, Body Fluid, Immunity. | Remember |
| 2 | Explain the basic physiological concept of cardiovascular system, functions, properties of cardiac muscle, Origin of Cardiac Impulse. | Understand |
| 3 | Determine the nerve – muscle physiology, neuromuscular junction & Mechanism of muscle contraction & central nervous system. | Apply |
| 4 | Analyze the Physiologic anatomy, functions of respiratory system, Mechanism of respiration & circulatory system. | Analyze |
| 5 | Assess the physiology of digestive system Composition and functions of all Digestive juices, Movements. | Evaluate |
| 6 | Formulate the physiological concept of excretory system, structure & function of excretory organs. | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

| Learning outcomes | 1. To understand the basic physiological concepts of General physiology<br>2. To understand the basic physiological concepts of Hematology<br>3. To understand the basic physiological concepts of Nerve-Muscle physiology.<br>4. To understand the basic physiological concepts of Respiratory physiology.<br>**5.** To understand the basic physiological concepts of Cardiovascular physiology |
|---|---|

**UNIT-I**

1. General Physiology
2. Cell, Transport across cell membrane, homeostasis, resting membrane potential, action potential
3. Blood: Composition and functions of Blood, RBC, WBC, Platelet count, Hemoglobin
4. Blood Groups - ABO and RH grouping
5. Hemostasis & Anticoagulants

**UNIT-II**

1. Cardio vascular system
2. Cardiac muscle, Pacemaker & conducting tissue
3. Cardiac Cycle, Cardiac output, Heart rate, ECG, Arterial blood pressure
4. Respiratory System: Functions of Respiratory system, Mechanism of respiration, lung volumes & capacities

**UNIT-III**

1. Nerve & Muscle physiology
2. Neuron structure & properties, Neuromuscular junction
3. Skeletal muscle structure mechanism of contraction
4. Cerebrospinal Fluid (CSF): Composition, functions & Circulation.
5. Central & autonomic Nervous system Organization of CNS
6. Functions of various parts of Brain, in brief
7. Composition, functions and circulation of CSF
8. Differences between sympathetic and parasympathetic division

**UNIT-IV**

1. Digestive system: Functional Anatomy, organization & innervations
2. Composition and functions of all Digestive juices
3. Digestion & Absorption of carbohydrates, proteins and fats

**UNIT-V**

1. Excretory System
2. Kidneys: Functions, Nephron, Juxta-glomerular Apparatus
3. Renal circulation
4. Mechanism of Urine formation, GFR
5. Endocrine and Reproductive systems Endocrine glands & hormones secreted
6. Functions of Reproductive system: Male Reproductive System: spermatogenesis, Testosterone, Female reproductive system: Ovulation, Menstrual cycle, Pregnancy test

**PRACTICALS**

1.Estimation of Hemoglobin Concentration

2.Determination of Bleeding Time and Clotting Time
3.Determination of Blood Groups
4.Recording of normal Blood Pressure
5.Determination of Vital Capacity

**Reference Books:**

1. A.K.Jain, Textbook of Physiology (Volume I & II) -9th edition -2021.

2. Dr. Venkatesh.D and Dr. Sudhakar H.S.Basic of Medical Physiology- Wolter-Kluwer Publication- edition – 4th edition - 2018

3. Chaudhari (Sujith K) Concise Medical Physiology - New Central Book- 7th edition - 2016

# GENERAL BIOCHEMISTRY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | General Biochemistry | 4 | 3 | 1 | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describe the biomolecules Introduction and scope of biochemistry, Chemistry of carbohydrates, proteins, lipids. | Remember |
| 2 | Explain the metabolism of glucose, fats & amino acids & their regulatory pathways. | Understand |
| 3 | Determine the structure & function of enzymes & its clinical importance | Apply |
| 4 | Analyze the RDA, Sources of Vitamins and Minerals, functions and deficiency of fat-soluble vitamins. | Analyze |
| 5 | Assess the balanced diet, Satiety value, Energy imbalance-obesity, starvation, Limitations of the daily food guide. | Evaluate |
| 6 | Formulate the conventional & specialized lab investigation, Principle and applications of Colorimeters, pH Meter. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

| Learning outcome | 1. To identify the five classes of polymeric biomolecules and their monomeric building blocks.<br>2. Explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.<br>3. Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP.<br>4. Describe how fats and amino acids are metabolized, and explain how they can be used for fuel. |
|---|---|

## UNIT-I

1. Cell: Morphology, structure & functions of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes.
2. Carbohydrates: Definition, chemical structure, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopoloysaccharide and its importance, glycoproteins

## UNIT-II

1. Lipids: Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid. Essential fatty acids and their importance, Blood lipids and their implications, cholesterol with its importance.
2. Proteins: Definition, sources, amino acids, structure of protein, their classification, simple protein, conjugated protein, derived proteins and their properties.

## UNIT-III

1. Enzymes: Definitions, mechanism of action, factors affecting enzyme action, enzyme of clinical importance.
2. Nutrition 1) Vitamins: Types, functions and role. 2) Principal minerals and their functions (Ca, P, Mg, Na, K, Cl) 3) Balanced diet, Diet for Chronically and terminally ill patients, post-operative patients

## UNIT- IV

1. Carbohydrate Metabolism: Glycolysis, TCA cycle, Glycogen metabolism, Gluconeogenesis, Maintenance of Blood Glucose. Diabetes Mellitus and its complications.
2. Lipid Metabolism: Beta oxidation, Ketone bodies, Cholesterol and atherosclerosis, obesity.

## UNIT-V

1. Protein metabolism: Transamination, Deamination, Fate of ammonia, urea synthesis and its inborn errors.
2. Water and Electrolyte, Fluid compartment, daily intake and output sodium and potassium balance

**PRACTICALS**

1.Introduction of Laboratory apparatus
2.Instruments (Theory & demonstration)
3. Urine Analysis
4. Analysis of blood sugar c.
5. RFTs (Estimation of blood urea, serum creatinine, creatinine clearance, and their implications)

**Reference Books:**

**1**: Essentials of Biochemistry – U.Satyanarayan , U.Chakrapani – 4th edition-2021

**2**: A textbook of Biochemistry – Dr S Anatomy of the endocrine system Anatomy of the endocrine system K Gupta – 2nd edition-2019

**3**: Concise textbook of Biochemistry for paramedical students – DM Vasudevan, Sukhas Mukherjee – 2nd edition.-2021

**4**: Essentials of Biochemistry - Pankaj Naik -6th edition.-2022

# MEDICAL ETHICS & COMPUTER SKILLS RELATED TO ORTHOPEDIC TECHNOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Medical Ethics & Computer Skills related to Orthopedic Technology | 4 | 3 | 1 | - | 20 | 80 | 100 |

**Course Outcomes:**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Legal and ethical challenges in healthcare. | Receive |
| 2 | Students explore the legal, ethical and moral issues in healthcare professionals. Identify issues related to potential legal liability in the workplace. | Respond |
| 3 | To introduce students to the discipline of public health. | Value |
| 4 | To give an overview of the methods of prevention and health promotion | Organize |
| 5 | To understand the determinants and measures of disease and health related states. | Characterize |
| 6 | To understand the status of health and disease at global and national levels. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

| Learning Outcome | 1. To develop ability to design and implement strategies to enhance public health and strengthen the health systems<br>2. To develop the critical ability to analyze and understand the impact of public health policies on health status and indicators Medical ethics is a practical application of moral standards that are meant to benefit the patient.<br>3. Able to understand complex healthcare public policy from all sides of an issue, regardless of your personal beliefs. |
|---|---|

**UNIT- I**

1. Medical ethics - Definition - Goal - Scope
2. Introduction to Code of conduct
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational drug therapy
5. Autonomy and informed consent - Right of patients
6. Care of the terminally ill- Euthanasia

**UNIT- II**

1. Organ transplantation
2. Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects
3. Professional Indemnity insurance policy
4. Development of standardized protocol to avoid near miss or sentinel events.
5. Obtaining an informed consent
6. Ethics in the profession of Medical Laboratory Science

**UNIT- III**

Computer applications related to Cardiology lab technician; various software's used in Cath Lab; interpretation of various laboratory parameters with computer software; advantages of using computers in Cath labs.

**Suggested readings:**

1. Medical Law and Ethics by Bonnie F Fremgen
2. Medical Law and Ethics by Jonathan Herring

## ENVIRONMENTAL SCIENCE & HEALTH

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement Course | ENVIRONMENTAL SCIENCE & HEALTH | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes:**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describes the components of Environment, basic concepts of Ecosystem & interaction of man & environment. | Receive |
| 2 | Discuss the Global environment problems, biodiversity loss, deforestation & desertification. | Respond |
| 3 | Demonstrate the environmental pollution with impact & control strategies of pollution in urban, rural & industrial areas. | Value |
| 4 | Define the environmental management, concept of health sanitation, environmental disease. | Organize |
| 5 | Revise the Environmental Protection Act, Environmental laws, National movements, environmental ethics. | Characterize |
| 6 | Follow the IUCN – role in environmental protection, aims & objectives of human right policies. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

| | |
|---|---|
| Learning Outcome | 1. Current environmental issues and highlights the importance of adopting an interdisciplinary approach.<br>2. Sample an ecosystem to determine population density and distribution.<br>3. Create food webs and analyse possible disruption of feeding relationship |

**UNIT-I**

**Components of Environment** – Hydrosphere, lithosphere, atmosphere and biosphere – definitions with examples; Interaction of man and environment;

Ecosystem: Basic concepts, components of ecosystem, Tropic levels, food chains and food webs, Ecological pyramids, ecosystem functions, Energy flow in ecological systems, Characteristics of terrestrial fresh water and marine ecosystems.

**UNIT-II**

**National Health Program-**Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Program.

**UNIT-III**

**Introduction toAYUSHsystemofmedicine-**IntroductiontoAyurveda;Yogaand Naturopathy;Unani;Siddha;Homeopathy;Needforintegrationofvarioussystemofmedicine.

**UNIT-IV**

**Environmental Management** – Concept of health and sanitation, environmental diseases – infectious (water and air borne) and pollution related, spread and control of these diseases, health hazards due to pesticide and metal pollution, waste treatment, solid waste management, environmental standards and quality monitoring.

**UNIT-V**

**Environmental Protection Act –** Environmental Laws, national movements, environmental ethics – holistic approach of environmental protection and conservation, IUCN – role in environmental protection. Concept with reference to UN – declaration, aim and objectives of human right policies with reference to India, recent north-south debate on the priorities of implementation, Environmental Protection Agency Bioremediation – Oil spills, Wastewater treatment, chemical degradation, heavy Metals.

**Reference books:**

1.National Health Programmes & Policies 2020-2021 – Samta Soni- 2nd edition.
**2.**Practical & Viva Community Medicine – J Kishore, Sneha Kumari- 5th edition.-2021
3.Textbook of Environmental Science – Dr Aruna Kumari Nakkella – 2022
4.Environmental Studies – Purnima Das - 2023

## SEMESTER-2

# GENERAL MICROBIOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | General Microbiology | 4 | 3 | 1 | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describes the Classification of microorgaisms, size, shape and structure of bacteria & Use of microscope in the study of bacteria. | Remember |
| 2 | Explain the classification & different methods with advantages and disadvantages of the various methods infection control measures. | Understand |
| 3 | Determine the immunology & perform serological tests or microbiological laboratory procedures. | Apply |
| 4 | Analyse the etiological agents of global infectious diseases, causative agents, transmission methods, investigation, prevention & control. | Analyse |
| 5 | Assess the clinical relevance of bacteriology, parasitology mycology & virology. | Evaluate |
| 6 | Formulate the causative agents & guidelines to stop the spread of infection in healthcare system. | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

| Learning Outcome | Upon completion, students should be able to demonstrate:<br>1. Knowledge of microorganisms and the disease process as well as aseptic and sterile techniques.<br>2. Perform microbiological laboratory procedures according to appropriate safety standards |
|---|---|

**UNIT-I**

Microorganisms

(a) Classification-Prokaryotes, Eukaryotes, Viruses, Fungi

(b) Morphology-size, shape, arrangement
(c) Special characteristics–spores, capsules, enzymes, mortality, reproduction
(d) Gram staining, ZN staining
(e) Different types of microscopes.

**UNIT-II**

Sterilization
(a) Definition.
(b) Different methods of sterilization including – Gaseous sterilization Plasma sterilization
(c) Advantage and disadvantage of various methods and their controls
(d) Sterilization of different instruments used in patients
(e) Preparation of materials for Autoclaving: packing, loading, holding time, unloading

**UNIT-III**

Disinfection
(a) Definition
(b) Different type of methods including High level disinfectants
(c) Disinfection of patient care unit and rooms(O.T., Wards, ICUs & Laboratories)
(d) Central supply department Areas and floor plan for instrument cleaning high level disinfection & sterilizing area

**UNIT-IV**

Asepsis
(a) Universal Precautions
(b) Use of aseptic precautions to prevent infection,
(c) Safety mechanisms including vaccination in prevention of blood borne infections
Hospital acquired infections

**UNIT-V**

Virology with special reference to hepatitis, poliomyelitis, HIV & Influenza
Immunity – Non-specific
- Natural & Acquired
- Allergy and Anaphylaxis

**PRACTICALS:**

1. Compound microscope and its application in microbiology.
2. Demonstration of sterilization equipment: hot air oven, autoclave.
3. Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Mac conkey medium, L J media.
4. Grams staining.
5. Acid fast staining

**Reference books:**

**1**: Complete Microbiology – 7 th edition -2022

**2**: Text & Practical Microbiology – CP Bveja& V Baveja – 3rd edition - 2022
**3**: Essentials of Medical Microbiology- Apurba S Sastry & Sandhya Bhat – 3rd edition-2021
**4**: Textbook of Microbiology – 12th edition- 2022

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | General Pathology | 4 | 3 | 1 | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Describes basis of systemic pathology & morphology of common disorders. | Remember |
| 2 | Explain the general principles of hematology & histopathology techniques. | Understand |
| 3 | Determine the general principle of cytopathology techniques & universal safety precaution. | Apply |
| 4 | Analyse the general principles of clinical pathology techniques, autopsy & museum. | Analyse |
| 5 | Assess the clinical information of accurate pathology diagnosis. | Evaluate |
| 6 | Formulate the pathological laboratory procedures according needed for final pathologic report. | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

| Learning Outcomes | 1. The student should submit the appropriate tissue sections per protocol to demonstrate the lesion and other clinically-relevant information needed for the final pathologic report.<br>2. To aid hematology in the reference ranges for hemoglobin, hematocrit, erythrocytes, and leukocytes in infants, children and adult. |
|---|---|

**UNIT: I**

Cell injury, cellular adaptation and cell death

- Causes of cell injury
- Reversible and Irreversible cell injury (Necrosis and its types with examples & morphology)
-Apoptosis
-Calcification
-Hyperplasia, Hypertrophy, Atrophy Metaplasia (Definition with examples).

**UNIT-II**

Inflammation and Repair

-Definition and type of inflammation
-Granulomatous inflammation with examples
-Chemical mediators of inflammation.
-Wound healing by 1st & 2nd intention.

**UNIT-III**

Fluid and Hemodynamic disturbances

-Oedema (Pathogenesis)
-Shock (Definition, Types)
-Thrombosis (Definition & Pathogenesis)
-Embolism (Definition & Pathogenesis)
-Infarction (Definition & Pathogenesis)

**UNIT-IV**

Neoplasia

-Definition and types of Neoplasia (Benign & Malignant neoplasms)
-Charactisties of Neoplasia.
-Pathogenesis of Neoplasia.
-Routes of spread

**UNIT-V**

Blood

Blood groups-ABO system, Rh system, Blood transfusion- Indication, transfusion reactions.

- Anaemias-classification, morphological and Etiological, effects of anaemia on body.

**PRACTICALS**

1. Collection of blood Samples
2. Various instruments used in Haematology
3. H b estimation.
4. Blood grouping

5. Urine complete examination

**Reference Books:**

**1**: Review of Pathology – Sparsh Gupta – 12th edition - 2020
**2**: Textbook of Haematology – Dr Tejinder Singh -2017
**3**: Essentials in Hematology&Clincal Pathology – 2nd edition - 2017
**4**: A textbook of Pathology–Harsh Mohan– 8th edition.-2019

# PHARMACOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Pharmacology | 4 | 3 | - | 2 | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Recall and identify the major drug classifications and their pharmacological properties | Remember |
| | Understand the mechanisms of drug action and their effects on various physiological systems | Understand |
| | Apply knowledge of pharmacological principles to assess and select appropriate drug therapies for specific medical conditions | Apply |
| | Analyse drug interactions and potential contraindications in clinical scenarios | Analyse |
| | Evaluate the efficacy and safety of drug therapies based on evidence-based medicine principles | Evaluate |
| | Create individualized pharmacotherapy plans for patients based on their specific needs and medical conditions. | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

| | |
|---|---|
| Learning Outcomes | 1. Students will be proficient in Pharmacology with proficient knowledge about the different drugs / medicines to be given in various cardiovascular diseases, dose calculation and mode of administration.<br>2. Also, recent advances in pharmacology will play a key role in research aspect of the students |

**UNIT- I**

General Pharmacology

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

b) routes of drug administration.

c) Adverse reactions to drugs.

d) Factors modifying drug response

**UNIT- II**

Autonomic nervous system & Peripheral nervous system

a) Sympathetic nervous system - sympathomimetics, sympatholytics

c) Parasympathetic - Cholinergics, Anticholinergics Drugs

d) Skeletal muscle relaxants

e) Local anaesthetics

**UNIT- III**

Central nervous system

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

c) Non-steroidalanti-inflammatory drugs

d) General anesthetics

AUTOCOIDS

a) Histamine and antihistaminics

**UNIT- IV**

(E) Cardiovascular system

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

c) Diuretics

d) Coagulants and anticoagulants, antiplatelet drugs

e) Hypo-lipidemics

(F) Gastrointestinal and respiratory system

c) Drug treatment of peptic ulcer

d) Drug therapy of bronchial asthma

**UNIT- V**

(G) Hormones

a) Drug therapy of Diabetes

d) Corticosteroids

b) Chemotherapeutic agents - b- Lactam Antibiotics, fluoroquinolones, aminoglycoside, tetracyclines, chloramphericol

**PRACTICALS**

a) Study of laboratory animals and their handling (a. Frogs, b. Mice, c. Rats, d. Guinea pigs, e. Rabbits).

b) Study of laboratory appliances used in experimental pharmacology.

c) Study of use of anesthetics in laboratory animals.

d) Effects of skeletal muscle relaxants using rota-rod apparatus.

e) Effect of drugs on locomotor activity using actophotometer.
f) Anticonvulsant effect of drugs by MES and PTZ method.
g) Study of local anesthetics by different method

**Reference Books:**

**1**: Padmaja Udaykumar – Pharmacology for Dental & Allied Health Sciences – 4th edition, 2017.
**2**: Joginder Singh Pathania,Rupendra Kumar Bharti,Vikas Sood-Textbook of Pharmacology for Paramedical Students 2019
**3**: KD Tripathi- Essentials of Pharmacology – 8th edition, 2018.
**4**: HL Sharma & KK Sharma – Principles of Pharmacology – 3rd edition, 2017.

**GENERAL ORTHOPEDICS**

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | General orthopedics | 4 | 3 | - | 2 | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describe the etiopathogenesis of orthopedic diseases. | Remember |
| | Explain the pharmacotherapy of drugs used for orthopedic diseases. | Understand |
| | To determine the drugs used in orthopedic surgeries. | Apply |
| | Analyzedrug-diseases andtherapeutic responses. | Analyze |
| | Assess the antibacterial drugs & Narcotics with indications & contraindication in day to day life | Evaluate |
| | Formulate the types of anesthesia and mechanism of action of local & general anesthetic drugs. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcomes

1. Students will be proficient in General orthopedics with proficient knowledge about the different drugs / medicines to be given in various musculoskeltal diseases, dose calculation and mode of administration.
2. Also, recent advances in pharmacology will play a key role in research aspect of the students

1. InfectionsofBone &Joints
2. TuberculosisofBone&Joints

3. InfectionsoftheHand
4. CTEV(CongenitalTalipesEquinoVarus)
5. CongenitalDislocationofHip
6. Poliomyelitis&otherNeuromusculardisorders
7. BoneTumors
8. ProlapsedIntervertebraldisc
9. Scoliosis &other spinaldeformities
10. Approachtopatientwithbackpain
11. Arthritis&relateddisorders
12. Degenerativedisorders
13. Affectionsofsofttissues
14. Metabolicbonediseases
15. Miscellaneousaffectionsofbone
16. Miscellaneousregionaldiseases
17. Amputations,Prosthetics&Orthotics
18. SportsMedicine&ArthroscopicSurgery
19. JointReplacementSurgery
20. OrthopaedicInstruments&Implants

## Practical: -

1. Joint Range of Motion Measurement:
   - Learn and practice the techniques for measuring range of motion (ROM) of various joints, such as the shoulder, elbow, wrist, hip, knee, and ankle.
   - Perform goniometric measurements and use appropriate tools for accurate assessment.
   - Interpret and document ROM findings for clinical evaluation.
2. Musculoskeletal Examination:
   - Learn and practice systematic musculoskeletal examination techniques, including inspection, palpation, range of motion assessment, muscle strength testing, and special tests.

- Perform musculoskeletal assessments for common orthopedic conditions, such as sprains, strains, fractures, and joint disorders.
- Develop proficiency in identifying abnormalities and assessing functional limitations.

3. Splinting and Casting:
   - Learn and practice the application of various types of splints and casts for immobilization and support of fractures, sprains, and other orthopedic conditions.
   - Understand the principles of proper splinting and casting techniques, including patient positioning, padding, and bandaging.
   - Gain proficiency in applying different types of splints and casts to different body parts, such as the upper extremities, lower extremities, and spine.
4. Orthopedic Imaging Interpretation:
   - Learn the basics of interpreting common orthopedic imaging modalities, such as X-rays, CT scans, and MRI scans.
   - Understand the radiographic appearances of fractures, dislocations, joint degeneration, and other orthopedic pathologies.
   - Practice interpreting imaging studies and correlating findings with clinical presentations.
5. Joint Injection Techniques:
   - Learn and practice joint injection techniques for the administration of corticosteroids, local anesthetics, and other therapeutic agents.
   - Understand the indications, contraindications, and potential complications associated with joint injections.
   - Gain proficiency in identifying proper injection sites, using aseptic techniques, and ensuring patient comfort and safety.
6. Surgical Skills Workshops:
   - Participate in simulated surgical skills workshops to develop an understanding of orthopedic surgical procedures.
   - Practice techniques such as suturing, knot tying, and basic orthopedic surgical procedures using synthetic models or cadavers under the guidance of experienced faculty.
7. Clinical Case Discussions:
   - Engage in interactive case discussions with peers and faculty members to analyze and evaluate orthopedic cases.
   - Apply knowledge of anatomy, biomechanics, and clinical assessment to formulate appropriate management plans for different orthopedic conditions.
   - Enhance critical thinking skills in evaluating treatment options and considering patient-specific factors

**Reference Books:**

1: "Orthopedic Physical Examination" by Bruce Reider, George J. Davies, and Matthew T. Provenche.
2: "Orthopedic Surgery: Principles and Practice" edited by Mark D. Miller, Jennifer Hart, and John M. Cuckler
3."Current Diagnosis & Treatment in Orthopedics" edited by Harry B. Skinner and Patrick J. McMahon

**SKILL ENHANCEMENT COURSE**

MEDICAL TERMINOLOGY AND RECORD KEEPING

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Skill Enhancement Course | MEDICAL TERMINOLOGY AND RECORD KEEPING | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes the basic importance of medical terms into their component parts. | Receive |
| | Analyze and spell words correctly. | Respond |
| | Identify combining forms, prefixes, suffixes and terminology associated with each of the body systems. | Value |
| | Understand the importance and types of medical records along with its management | Organize |
| | Revise to compose records in hospitals | Characterize |
| | Follow the values and skills required in medical audit | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes:

After completion of the course, students would be able to:

1. Ensuring successful learning of basic and advance medical terminology

2. Student will able to read, write, spell and understand the medical terminology

3. Understand the types, importance and role of medical records and its management techniques.

**UNIT-I**

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

**UNIT-II**

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

**UNIT-III**

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

**UNIT-IV**

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

**UNIT-V**

Medical Audit: its process, role and importance in hospitals.

**Reference Books:**


- Davies, Juanita. Essentials of Medical Terminology. 3rd edition. New York. Delmar. 2008.
- Mogli. J.D. Medical Records: Organization & Management 2ndedition New Delhi: Jaypee Brothers.
- The body by Bilbirson Agreed for Occupance

## SEMESTER-3

# ORTHOPEDIC INSTRUMENTS & ITS MAINTENANCE

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Orthopedic instruments & its maintenance | 4 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Use of mandatory orthopedic equipment. | Remember |
| 2 | Procedure of handling and safety measures of these instruments. | Understand |
| 3 | To determine the instruments used in orthopedic surgeries. | Apply |
| 4 | Analyze the use of instrumentsfor orthopedics. | Analyze |
| 5 | Validate the instruments and calibration. | Evaluate |
| 6 | Preparation of the pre-surgical mandates. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcomes

1. Students will be proficient in orthopedics instruments and its maintenance with proficient knowledge about the different drugs / medicines to be given in various musculoskeletal diseases, dose calculation and mode of administration.
2. Also, recent advances in orthopedics instruments and its maintenance will play a key role in research aspect of the students

1.Introduction to equipment's.

This is a practical oriented laboratory in which the students. Will be given hands on experience of the equipment's used in the laboratory. After undergoing the practical, the students will be able to handle the equipment's properly and he / she will be able to repair and maintain the equipment's used in the laboratory.

2. Simple usage.
3. Indication and contraindication of use.
4. Repair and maintenance of equipment's used in laboratory.
5. Microscope digital.
6. Centrifuge (different types).
7. Serological water Bath 37$^{O}$C.
8. Micropipette.
9. Balances (different type)
10. Distilled water units.
11. Hot air oven.
12. Autoclave.
13. Sterilization.
14. Water bath. (Different types).
15. pH Meter.
16. Incubator
17. Microtome (different types).
18. Semi auto and fully automatic analyzer.
19. Fully automatic cells counits.
20. Flame photometer.
21. Automatic tissue processor.
22. Automatic cover slipper. Automatic blood weight machine.
23. Freeze, Rotary shaker.
24. Core meter.
25. Microscope, monocular, binocular, dark field immersion.
26. Computer

## GLASS WARE:

- General Glass ware.
- Different types of glass pipette.
- Different types of glass flasks and funnel
- Care and maintain of glass ware plastic units. Different types of test tubes.
- Glass capillary.
- Automatic dispensers and diluters.
- Different types of slide racks, glass slides and cover glass.
- Demonstration of all Instruments and glass ware and other Instruments.

**PRACTICALS**

- **Use of Osteotomes** for cutting and preparing bone.
- **Use of Bone Cutting Forceps** for cutting and removing bones during orthopedic surgery.
- **Use of Gigli Saws** for flexible wire saws used by surgeons for bone cutting. Used mainly for amputations.
- **Use of Plate Benders** for bend a plate to the appropriate configuration and during bone fracture surgery.

**Reference Books**

1. "Orthopedic Instruments: A Manual of Their Use and Care" by Adrian D. Osbon and Sam W. Wiesel
2. "Orthopedic Surgery Instrumentation: A Comprehensive Guide" by Mihir M. Shah
3. "Orthopedic Instruments: A Pocket Guide" by John R. Goldner and John J. Burke

# FIRSTAID PROCEDURES

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Firstaid procedures | 4 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Basic necessities and safety measures for first-aid. | Remember |
| | Understand appropriate first-aid sequence. | Understand |
| | Basic first-aid protocol. | Apply |
| | Use of medicines and therapeutics of first-aid and their response. | Analyze |
| | Primary care response outcomes | Evaluate |
| | First-aid box with all necessary medicines | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

| | |
|---|---|
| Learning Outcomes | 1. Students will be proficient in First-aid with proficient knowledge about the different drugs / medicines to be given in various musculoskeletal diseases, dose calculation and mode of administration. |

1. Definitionoffirstaid,aimsandobjectives,responsibilitiesandgeneralprinciplesforfirstaiders
.
2. Firstaidkit,articlesandpurposes
3. Dressing materials and principles of wound dressing
4. Principles and uses of traction splint and slings
5. Basic trauma support
6. Transportation and triage in polytrauma patients

**Reference Books:**


1. The AMA Handbook of First Aid and Medical Care
2. Manual of FIRST AID: Management of General injuries, Sports injuries and Common Ailments Paperback – 1 January 2012 by LC Gupta(Author).
3. The scouting guide to wilderness first aid, Grant S. Lipman.

# DEFORMITIES: CONGENITAL & ACQUIRED

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Deformities: congenital & acquired | 4 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Different types of deformities and malformations | Remember |
| | Diagnostics and imaging of deformities | Understand |
| | Therapeutics and physiotherapy for deformities | Apply |
| | Therapeutic response for deformities | Analyze |
| | Deformities and their causes | Evaluate |
| | Easy and rapid assessment for deformities | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcomes

1. Students will be proficient in orthopedicsdeformities with proficient knowledge about the different drugs / medicines to be given in various musculoskeletal diseases, dose calculation and mode of administration.
2. Also, recent advances in orthopedicsmalformations will play a key role in research aspect of the students

1. CongenitalTalipesEquinoVarus(CTEV)
2. Genu varum
3. Genu valgum
4. Coxa vara
5. Coxa Valga
6. Post traumatic deformity of long bone
    A. Varus and valgus deformity of long bone fracture
    B. Flexion and extension deformity of long bone fracture
    C. Rotational deformity of long bone fractures
7. Flexion contracture of knee
8. Scoliosis
9. Kyphosis
10. Winging of scapula
11. Gunstock deformity
12. Dinner fork deformity
13. Wedge correction of malunited fracture
14. DDH

**Reference Books:**


1. Essential Orthopaedics (Including Clinical Methods) Paperback – 1 January 2019 by J Maheshwari (Author), Vikram A Mhaskar (Author)
2. Deformities: A Textbook on Orthopedic Surgery (Classic Reprint) Hardcover – 22 April 2018 by Edward J Farnum (Author)


# TRAUMA IN ORTHOPEDICS

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Trauma in orthopedics | 4 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| 1 | Different kinds of trauma in orthopedics | Remember |
| 2 | Deformities and fractures | Understand |
| 3 | Fracture and injuries for deformities | Apply |
| 4 | First aid and deformities analysis | Analyze |
| 5 | Primary and secondary care evaluation | Evaluate |
| 6 | Easy understanding for different kinds of injuries and trauma | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

| Learning Outcomes | 1. Students will be proficient in orthopedicstrauma with knowledge about the different drugs / medicines to be given in various musculoskeletal diseases, dose calculation and mode of administration.<br>2. Also, recent advances in orthopedicstrauma and its maintenance will play a key role in research aspect of the students |
|---|---|

1. Fractures-Types,Healing&Complications
2. Functionalpositionofjoints
3. Careofpatientswithplaster
4. Howtoapplytractionandcounter-traction.
5. Reductiontechniques
6. RegionalTrauma

A. Proximal humerus fracture
B. Shaft of humerus bone
C. Supracondylar fracture of humerus
D. Forearm fracture
E. Distal radios fracture
F. Metacarpal and finger fracture
G. Pelvis fracture
H. Hip fracture
I. Femur fracture
J. Tibial plateau fracture
K. Leg bone fracture
L. Ankle fracture
M. Metatarsal fracture

7. Common dislocation and subluxations (Shoulder, Hip, Elbow, Knee and Finger)

**Practical:**

1. Dressingmaterialandmethods
2. Firstaidkitdescription
3. Ivcannula,needles,syringes -theirproperuseanddisposal
4. Woundcare
5. Steriledressingtechniques
6. Differentmodesofadministrationofdrugs
7. Basicinterpretationofradiographs

**ReferenceBooks:**


1. "Rockwood and Green's Fractures in Adults" edited by Charles Court-Brown, James D. Heckman, and Michael McKee
2. "Skeletal Trauma: Basic Science, Management, and Reconstruction" edited by Bruce D. Browner, Jesse B. Jupiter, and Christian Krettek
3. "Orthopaedic Trauma: The Stanmore and Royal London Guide" edited by Sebastian Dawson-Bowling, Mohit Bhandari, and Tim Briggs


**CLINICAL POSTING: 45 days of hospital duty is necessary.**

## DISCIPLINE SPECIFIC ELECTIVE

## GENERAL PRINCIPLES AND PRACTICES OF PUBLIC HEALTH

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Discipline Specific Elective | General Principles and Practices of Public Health | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | To provide students an insight into core concepts, theories and accounting practices which are adapted and practice on day to day basis in the organization. | Receive |
| | It also helps to develop analytical and problem-solving skills which are required by administrators. | Respond |
| | To learn Patient's record keeping preoperatively, during anesthesia and post-operatively. | Value |
| | To learn Principles and techniques of temperature monitoring. | Organize |
| | Positioning during surgical procedures | Characterize |
| | Able to manage Indenting, Record keeping and inventory maintenance | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. To acquire understanding of the functions of management and administration of the healthcare business.
2. To understand healthcare delivery systems.
3. To acquire and practice leadership and managerial skills that will positively affect performance as a healthcare manager
4. Learn the basic nursing skills of various surgical procedures including the surgical instruments used in the surgical procedures
5. Assist in various invasive and non-invasive procedures

## UNIT-I

Introduction to Patient Care:

a)Principles of patient care b)Types of patients (gender, age, diseases, severity of illness, triage)

Communication:

Communication with doctors, colleagues and other staffs.

b)Non-verbal communication, Inter-personnel relationships.

c)patient contact techniques, communication with patients and their relatives

Documentation:

a.Importance of documentation,

b.initial and follow up notes;

c.documentation of therapy, procedures and communication.

## UNIT-II

Universal Precautions and Infection Control:

a)Hand washing and hygiene. b)Injuries and Personal protection, Insulation and safety procedures. c)Aseptic techniques, sterilization and disinfection. d)Disinfection and Sterilization of devices and equipment e)Central sterilization and supply department f)Biomedical Medical waste management.

## UNIT-III

Medication Administration:

a) Oral / Parenteral route
b) Parenteral medication administration: Intra venous, intra muscular, sub-cutaneous,intra dermal routes, Intra venous Infusion
c) Aerosol medication administration, Oxygen therapy
d) Intravenous fluids,e)Blood and blood component transfusion Position and Transport of patient:
a) Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
b) Lifting and transporting patients: lifting patients up in the bed, transferringfrom bed to wheel chair, transferring from bed to stretcher.
c) Transport of ill patients (inotropes, intubated /ventilated patients)

## UNIT-IV

Bedside care:

a) Methods of giving nourishment: feeding, tube feeding, drips, transfusion.b)Recording of pulse, blood pressure, respiration, saturation and temperature.c)Bedside management: giving and taking bed pan, urine container.d)Observation of stools, urine, sputum, drainse)Use and care of catheters and rubber goods.f)Care of immobile/bed ridden patients, bed sore and aspiration prevention

Monitoring of Patient:

a)Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure,Respirationb)Multi parameter monitors, Capnography and End Tidal CO2 (ETCO2)c)Hydration, intake and output monitoringd)Monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures,Compliance, Resistance

## UNIT-V

Dressing and wound care:

a)Bandaging: basic turns, bandaging extremities, triangular bandages and theirapplication.b)Surgical dressing: observation of dressing procedures.c)Suture materials and suturing techniquesd)Splintinge)Basic care of patient with burns.

**Reference books:**

1.Hospital and patient care management – Dr.Vidhya Srinivasan &Dr.Akshay Ch.Deka-2022
2.Principles of hospital practice and patient care – P Srinivasulu Reddy – 1st edition -2019
3.Principles & Practice of Critical Care – P.K Verma – 3rd edition- 2019.
4.Standard treatment guidelines – a manual of medical therapeutics- Sangeeta Sharma & GR Sethi – 6th edition – 2021.

# FORENSIC PSYCHOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Discipline Specific Elective | Forensic Psychology | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Develop understanding about the interplay of various psychological factors. | Receive |
| | Respond & familiarize with basics of psychology. | Respond |
| | Understand the psychology of offenders & defenders. | Value |
| | Apply psychological knowledge to the legal system. | Organize |
| | Learn the psychology of eyewitness testimony. | Characterize |
| | Receive complex ethical issues and resolve ethically. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Cognitive Thinking.
2. Analyze complex & diverse concepts
3. Think critically.

**UNIT-I**

The Psychology of Criminal Conduct
Offender Profiling

**UNIT-II**

Eyewitness Testimony and Identification
Investigative Interviewing of Children

**UNIT-III**

Investigative Interviewing of Suspects
The Psychology of Lying and the Detection of Deception

**UNIT-IV**

The Psychology of False Confessions
Famous Miscarriages of Justice

**UNIT-V**

Jury and Decision-Making
Juvenile Delinquency and Underage Crimes
The Psychologist as Expert Witness: Practical and Ethical Issues

**Reference books:**

1.The Forensic Psychology of Criminal Minds- Katherine Ramsland – 1st edition -2010
2.Forensic Psychology Workbook- Connor Whiteley – 2018
3.Forensic Psychology- Avery short introduction-David Canter – 2010.
4.Forensic Psychology-Dr Lakshmaeshwar Thakur-2019.

## ABILITY ENHANCEMENT COURSE

## COMPUTER

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement Course | Computer | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Aim at imparting a basic level appreciation programme for the common man. Able to the use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc. | Receive |
| | Make digitally literate. | Respond |
| | Understand to aid the PC penetration program. | Value |
| | Helps the small business communities, housewives to maintain their small account using the computers and enjoy in the world of Information Technology. | Organize |
| | Characterize Cultural and Global Awareness. | Characterize |
| | Receive knowledge of Professional Practice. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Systems Thinking.
2. Problem-Solving.
3. Communication.
4. Teamwork.
5. Context Awareness.

## UNIT-I

**Introduction and Definition of Computer:** Computer Generation, Characteristics of Computer,Advantages and Limitations of a computer, Classification of computers, Functional componentsof a computer system (Input, CPU, Storage and Output Unit), Types of memory (Primary andSecondary) Memory Hierarchy. Hardware: a) Input Devices- Keyboard, Mouse, Scanner, BarCode Reader b) Output Devices – Visual Display Unit (VDU), Printers, Plotters etc. Software:Introduction, types of software with examples, Introduction to languages, Compiler, Interpreterand Assembler. Number System: Decimal, Octal, Binary and Hexadecimal Conversions, BCD,ASCII and EBCDIC Codes.

## UNIT-II

**MS – DOS:** Getting Started on DOS with Booting the System, Internal Commands: CHDIR(CD),CLS, COPY, DATE, DEL(ERASE), DIR, CHARACTER, EXIT,MKDIR(MD), REM, RENAME(REN), RMDIR(RD), TIME, TYPE, VER, VOL, External Commands: ATTRIB, CHKDSK, COMMAND, DOSKEY, EDIT, FORMAT,HELP, LABEL, MORE, REPLACE, RESTORE, SORT, TREE, UNDELETE, UNFORMAT,XCOPY. **Introduction of Internet:** History of internet, Web Browsers, Searching and Surfing, Creating anE-Mail account, sending and receiving E-Mails.

## UNIT-III

**MS Word:** Starting MS WORD, Creating and formatting a document, Changing fonts and pointsize, Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Insertingobjects, Page setup, Page Preview, Printing a document, Mail Merge.

## UNIT-IV

**MS Excel:** Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Textwrapping , Sorting data, Auto Sum, Use of functions, Cell Referencing form, Generating graphs,Worksheet data and charts with WORD, Creating Hyperlink to a WORD document, Page set up,Print Preview, Printing Worksheets.MS Power Point: Starting MS–Power Point,, Creating a presentation using auto content Wizard,Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation,Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word artgallery, Adding Transition and Animation effects, setting timings for slide show, preparing notepages, preparing audience handouts, printing presentation documents. MS – Access: creating tableand database.

## UNIT-V

**MS-POWERPOINT:** Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using

Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents.

## BASIC EMERGENCY MANAGEMENT

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement Course | Basic Emergency Management | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Emergency plan during crisis & knowledge of emergency equipment's. | Receive |
| | Emergency plan specifies procedures for handling sudden or unexpected situations. | Respond |
| | Recognize common,urgent and emergent problems | Value |
| | Organize planning of special resuscitative procedures. | Organize |
| | Characterize medical & surgical emergencies. | Characterize |
| | Receive knowledge of emergency drugs or medicines. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome — On completion of this course, the students will be able to do the following:

1. Emergency planning
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

**UNIT-I**

**Emergency Equipment**

1. Laryngoscopes
2. Endo-tracheal tubes (ETT), boogie
3. Ambu bag and mask
4. Airway adjuncts, supra-glottic airway devices including Laryngeal mask airway

(LMA)
5. Types of oxygen masks, venturi etc.
6. Oropharyngeal and nasopharyngeal airways (OPA and NPA)
7. ICD tubes, bags, jars, instrument tray
8. Suction apparatus
9. Pulse oximeter
10. EtCO2 monitor
11. Oxygen pipe-line and medical gas cylinders, pipelines and manifold
12. Ambulance (Cervical) Collar, Philadelphia Collar

**UNIT-II**

**Introductions to Emergency Services**

Principles of resuscitation
1. Sudden cardiac death
2. Cardiac, respiratory arrest
3. Basic cardiopulmonary resuscitation in adults, neonates ,paediatrics& pregnancy.
4. Advanced cardiac life support

**UNIT –III**

Specific resuscitative procedures
1. Airway management
2. Breathing and ventilation management
3. Venous and intraosseous access
4. Defibrillation and cardioversion
5. Fluid and blood resuscitation
6. Vasoactive agents in resuscitation
7. Arrhythmias

**UNIT-IV**

1. Medical emergencies
2. Fluids and electrolytes
3. Respiratory Emergencies
4. Gastrointestinal Emergencies
5. Cardiovascular Emergencies
6. Central Nervous System Emergencies
7. Genito urinary emergencies
8. Hematological Disorders
9. Endocrine and Metabolic Emergencies

**UNIT-V**

**Emergency Drugs** - Drug introduction, indication, contra-indications, side – effects and routes of administration with doses of following drugs:
Toxicology

Emergencies due to venomous bites and stings:
Industrial Hazards
Obstetrical emergencies
Mental Health Emergencies
Paediatric emergencies

**Reference books:**

1. Medical Emergencies in general practice-S.P.Gupta& O.K.Gupta-2011
2. Manual of Emergency Medicine-Lippincott & Williams & Wilkins-6th edition-2011
3. Handbook of casualty and Emergency –Rajiv-2nd edition-2019.
4. Emergency medicines-SN Chugh& Ashima Chugh-5th edition-2019

## SEMESTER-4

# PLASTER TECHNOLOGY – I

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement Course | Plaster technology – I | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Types of plasters and techniques used | Remember |
| | Necessity of different kinds of deformities | Understand |
| | Procedures of application of POP | Apply |
| | Outcomes of different types of plaster techniques | Analyze |
| | Treatment response | Evaluate |
| | New and appropriate technique for fracture management | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Plasters
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

1. HistoryofplasterofParis
2. PropertiesofplasterofParis
3. PreparationofplasterofParisbandages,
4. Synthetics cast material
5. Use, advantage and disadvantages of synthetic cast

6. Differenttypesofslabsandcasts

A . Hip Spica
B. Gt Slab And Cast
C. Below Knee Slab And Cast
D. Cylindrical Slab And Cast
E. U-Slab And Cast
F. Above Elbow Slab And Cast
G. Below Elbow Slab And Cast
H. Cock up Slab And Cast
I. Scaphoid Slab And Cast
J. Finger Splinting
K. Boot And Bar Cast
L. Hanging Cast
M. Minerva Cast

7. Specialplaster-CTEV Cast andPTB Castetc.

**Reference books:**


1. Plaster application by Rajendra Kumar Kanojia
2. "Practical Fracture Treatment" by Ronald McRae and Max Esser
3. "Orthopedic Casting, Splinting, and Traction" by Robert L. Paris Jr. and Fred T. Valentine

# OPERATION ROOM TECHNIQUES – I

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Operation room techniques – I | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | The basic requirements of equipment's in OT | Remember |
| | Importance of hygienicity and safety measures for OT | Understand |
| | OT specifications | Apply |
| | The case and its surgical requirements | Analyze |
| | The hygiene conditions for OT and ethics in OT | Evaluate |
| | To formulate new case specific conditions in OT for surgery | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Requirements of equipments in OT
2. The hygiene conditions for OT
3. Safety measures for OT.

1. ReceptionofpatientsinOTpremises
2. Scrubbing and Preparation of operation site
3. Tourniquet- types and it's usage,
4. Functioning of Tourniquet, Handling and its storage
5. Gowning,paintinganddraping
6. OT Specifications, and properties

7. OTFumigation
8. Autoclaving
9. UV lights sterilization
10. Preparationforanesthesia

**Reference books:**

1.OperationTheatreTechniques by RashmiS.Patil
2. "Alexander's Care of the Patient in Surgery" by Jane C. Rothrock
3. "Berry & Kohn's Operating Room Technique" by Nancymarie Phillips

# COMMON ORTHOPEDIC PROCEDURES – I

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement Course | Common orthopedic procedures – I | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Memorize the steps involved in pre-operative and post-operative care for orthopaedic procedures. | Remember |
| | Understand the rationale behind common orthopedic procedures and their impact on patient outcomes | Understand |
| | Apply the knowledge of surgical instruments, implants, and sterile techniques during orthopedic procedures. | Apply |
| | Analyze pre-operative assessments and diagnostic tests to determine the need for orthopedic procedures. | Analyze |
| | Evaluate the effectiveness of different orthopedic procedures in addressing specific conditions | Evaluate |
| | Design protocols and guidelines to improve the quality and safety of orthopedic procedures. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Orthopedic procedures
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

1. -Wiring in hand fracture
2. K-Wiring in Bennet's fracture
3. K-Wiring in Distal end radius fracture
4. K-Wiring in Pediatric supracondylar fracture
5. K-Wiring in in foot fractures
6. Patella Tension Band Wiring
7. Olecranon tension band wiring
8. Tension band wiring of medial malleolus and plating of fibula fracture

**Reference books:**

1.Operative techniques in orthopaedic surgery 4 volume set Product Bundle – Illustrated, 1 January 2015By Sam W Wiesel Samuel W Wiesel (Author)
2.Essentials of Orthopedic Surgery Paperback – Illustrated, 5 October 2010
by Sam W. Wiesel (Editor), John N. Delahay (Editor)

# ENVIRONMENTAL & BIOMEDICAL WASTE MANAGEMENT; ENTREPRENEURSHIP AND PROFESSIONAL MANAGEMENT

**1.(A) General:**

a. Biotic and biotic environment
b. Adverse effects of Environmental Pollution
c. Control Strategies
d. Various Acts and Regulations

**(B) Water Pollution:**

a. Water Quality Standards for potable water
b. Surface and underground water sources
c. Impurities in water and their removal
d. De-fluoridation
e. Adverse effects of domestic waste water and industrial effluent to surface water sources
f. Eutrophication of lakes
g. Self-purification of streams

**(C) Air Pollution:**

a. Sources of air contaminants
b. Adverse effects on human health
c. Measurement of air quality standards and their permissible limits
d. Measures to check air pollution
e. Greenhouse effect
g. Ozone depletion

**2(A). Bio Medical Waste Management**

a. Introduction to bio-medical Waste
b. Types of bio-medical waste
c. Collection of bio-medical waste
d. Treatment and safe disposal of bio-medical waste

1. Ethics of Bio-Safety.
2. Code of good and safe laboratory practice for support staff and responsibilities of the workers regarding Bio-safety.
3. Rules for laboratory medicine.
4. Set up of a laboratory o the basis of safety priority and Laboratory Bio-safety Guidelines.
5. Laboratory Biosafety Level Criteria (BSL-1-4).
6. Handling, transfer and shipment of specimen. Decontamination and disposal. Treatment and disposal technologies for health-care waste.
7. Wastes management, life cycle of bio-medical wastes.

8. Reduce recycle and reuse of wasters, technology used for bio-medical wastes treatment and disposal.
9. Chemical, electrical, fire and radiation safety. Safety organization.
10. General safety checklist.
11. Hazardous properties of instruments and Laboratory chemicals. Laboratory first-aid measures and Kit.
12. Safety equipments. Safety signs.

**Unit 1: Introduction to environmental studies;**

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept to sustainability and sustainable development.
  **(2 Lectures)**

**Unit 2: Ecosystems**

- What is an ecosystem; Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case Studies of the following ecosystems:
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)
  **(6 Lectures)**

**Unit 3: Natural resources: renewable and Non-renewable resources**

- Land resources and landaus change; land degradation, soil erosion and desertification.
- Deforestation: Causes and impact due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.
  **(8 Lectures)**

**Unit 4: Biodiversity and Conservation**

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot sport.
- India as a mega-biodiversity nation; Endangered and endemic species of India.
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and informational value.

**(8 Lectures)**

**Unit 5: Environmental Pollution**

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies.

**(8 Lectures)**

**Unit 6: Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.**

- Environment Laws: Environmental Protection Act; Air (Prevention & Control of Pollution) Act; water (Prevention and control of Pollution) Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological diversity (CBD).
- Nature reserves, tribal population and rights, and human wildlife conflicts in India context.

**(7 Lectures)**

**Unit 7: Human Communities and the Environment**

- Human population growth: Impacts on environment, human health and welfare.
- Resettlements and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movements: Chipko, silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of India and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

**(6 Lectures)**

**Unit 8: Field Work**

- Visit to an area to documents environmental assets: river/forest/flora/fauna, etc.
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-pond, river, Delhi Ridge, etc.

**(Equal to 5 Lectures)**

**Suggested Readings**:


1. Carson, r. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. Of California Press.
3. Gleeson, B. and low, N. (eds.) 1999. Global Ethics and Environment, London, Rout ledge.

4. Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinaure Associates, 2006.
6. Grumbine, R Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
7. McCully, P. 1996 river no more: the environmental effects of dams (pp.29-64). Zed Books.
8. McNeill, john. R. 2000. Something New Under the Sun: An Environmental History of the twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, j.1971. fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. &Brusseau,M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.n& Datta, A.K. 1987. Waste water treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan,t S., Noble, M.L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R.2003. Ecology and economics: An approach to sustainable Development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Sciecne and Conservation. S.Chand Publishing. New Delhi.
16. Sodhi, N.S., Gibson, L.& raven, P.H. (eds) 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C.E. 1971. Biology and Water Pollution Control. WB Sauders.
19. Wilson, E.O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. Word Commission on Environment and Development. 1987. Our Common future. Oxford University Press.

## DISCIPLINE SPECIFIC ELECTIVE

Communication skill for Health care professional

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Discipline Specific Elective | Communication skill for Health care professional | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Explain and describe effective and non-effective communication techniques | Receive |
| | Differentiate between verbal and non-verbal communication. | Respond |
| | Identify behaviors that interfere with effective communication | Value |
| | Understand interview techniques and demonstrate or explain appropriate patient education practices | Organize |
| | Characterize relationships among various health care professionals and patients of various educational levels. | Characterize |
| | Follow elements of active listening and benefits of professional communication | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. The purpose of this course is to prepare students with basic interpersonal and communication skills needed by the Medical Assistants in the medical office or clinic setting

## UNIT-I

Identify practices for effective verbal communication with patients and other healthcare providers .Develop skills for listening and paraphrasing. Demonstrate methods of questioning the patient

## UNIT-II

Explain how low health literacy may impact a patient's health. Describe strategies that will facilitate communication between a healthcare professional and a patient who is visually impaired, hearing impaired, or speaks a different language

## UNIT-III

Identify the benefits of patient education. Distinguish the three types of learning styles. Describe the benefits of using visual aids and written materials

## UNIT-IV

Explain how telecommunication, fax, and email differ from face-to-face communication. Discuss the guidelines for the effective use of the telephone in the healthcare setting. List the symptoms and conditions that require immediate medical help

## UNIT-V

Explain the purposes of the parts of speech and punctuation. Illustrate correct sentence grammar

**Reference books:**


4. Communication Skills for the Healthcare Professional, First edition
5. McCorry, L., Mason, J, Lippincott Williams & Wilkins, Copyright 2011
3. Textbook of radiological safety- GK Rath – 1st edition – 2010
4. Aids to radiological differential diagnosis- Stephen Davies- Elsevier -6th edition -2013

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Discipline Specific Elective | INTRODUCTION TO NATIONAL HEALTHCARE SYSTEM | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes &Orient the students towards the Hospital Personnel Management and Legal Aspects in Hospitals | Receive |
| | Discuss the parameters of Hospital Operations Management | Respond |
| | Demonstrate theRecent Trends in Healthcare Systems | Value |
| | Define the Do's and Don'ts for Occupational Health | Organize |
| | Revise the Role of Planning and Organization of Utility Services in hospital | Characterize |
| | Follow the skills for Inventory and Stores Administration Fundamentals of Financial Management | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Course Objective

1. To familiarise with the healthcare environment ¬ To understand the concepts of management with relevance to hospitals

**UNIT I**

Introduction – Theoretical frame work - Environment - Internal and External – Environmental Scanning – Economic Environment – Competitive Environment – Natural Environment – Politico Legal Environment – Socio Cultural Environment - International and Technological Environment.

**UNIT II**

A Conceptual Approach to Understanding the Health Care Systems – Evolution – Institutional Setting - Out Patient services – Medical Services – Surgical Services – Operating department – Pediatric services – Dental services – Psychiatric services – Casualty & Emergency services – Hospital Laboratory services – Anesthesia services – Obstetrics and Gynecology services – Neuro – Surgery service – Neurology services.

## UNIT III

Overview of Health Care Sector in India – Primary care – Secondary care – Tertiary care – Rural Medical care – urban medical care – curative care – Preventive care – General & special Hospitals-Understanding the Hospital Management – Role of Medical, Nursing Staff, Paramedical and Supporting Staff - Health Policy - Population Policy - Drug Policy – Medical Education Policy

## UNIT IV

Health Care Regulation – WHO, International Health regulations, IMA, MCI, State Medical Council Bodies, Health universities and Teaching Hospitals and other Health care Delivery Systems

## UNIT V

Epidemiology – Aims – Principles – Descriptive, Analytical and Experimental Epidemiology - Methods - Use

**Reference books:**


1.Seth,M.L. MACROECONOMICS, Laksminarayana Agrawal, Edu,Pub.Agra.1996

2. Peter,Z& Fredrick, B. HEALTH ECONOMICS, Oxford Pub., New York, 1997

3. Shanmugansundaram, Y., HEALTH ECONOMICS, Oxford Pub. New York, 1997

## SKILL ENHANCEMENT COURSE

## MEDICAL LAW

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Skill Enhancement Course | Medical Law | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Introduces learners to the linkages between the fields of law and health in order to assist them in taking informed | Receive |
| | Contextualizes the constitutional dimension to 'right to health' | Respond |
| | Relevant for doctors | Value |
| | Identify and value legal sources and norms in the field of medical law at both a national, and international, level | Organize |
| | Characterize the rules of medical law in a qualified manner and to identify possible solutions to biomedical legal problems | Characterize |
| | Receive the interplay and differences between different types of legal responsibilities and sanctions in medical law | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. The students are expected after the conclusion of the course to be able to:
2. Understand the interplay between ethics and law in the field of biomedicine
3. To identify and analyse the conflicts of interest and legal problems that are relevant in different areas of medical law

**UNIT-I**

Medical ethics - Definition - Goal – Scope
Introduction to Code of conduct

**UNIT-II**

Basic principles of medical ethics –Confidentiality
Malpractice and negligence - Rational and irrational drug therapy

**UNIT-III**

Autonomy and informed consent - Right of patients
Care of the terminally ill- Euthanasia

**UNIT-IV**

Organ transplantation
Medico legal aspects of medical records –Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects.

**UNIT-V**

Professional Indemnity insurance policy
Development of standardized protocol to avoid near miss or sentinel events
Obtaining an informed consent

**Reference books:**

1.Law relating to medical negligence and compensation- Dr.K.P.D.A. Prabakar &Dr.J.Paulraj Joseph – 2023
2.A textbook of medical jurisprudence and toxicology – Justice K Kannan -25th edition – 1st edition – 2016
3.Law the doctor must know- Hitesh J Bhatt &Geetebdra Sharma – 2017
4.Law on medical negligence and legal remedies – Dr.Annu Bahl Mehra & Harshit Kiran-2022

## ETHICS IN PUBLIC HEALTH

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Skill Enhancement Course | Ethics in public health | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describe how the ethical principles/virtues of autonomy, justice, trust, caring beneficence, and normal efficiency apply to the delivery of health care | Receive |
| | Use a foundation in moral philosophy to make and support ethical decisions as a health care leader | Respond |
| | Apply an ethical decision-making process to various contemporary and complex health care issues | Value |
| | Influence decision-making among peers; use and model self-reflection, listening, empathy, and awareness as an ethical leader | Organize |
| | Recognize the importance of and bring to bear ethical principles, virtues, values and theory in professional discourse. | Characterize |
| | Receive of human rights in ethics. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes The students will develop:

1. Clinical ethical Competency.
2. Ethical awareness, Empathy

**UNIT-I**

Introduction to Public Health Ethics
Theories of Justice and Distribution of Public Health Resources
Principle for Public Health Ethics

**UNIT-II**

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

**UNIT-III**

Medical Ethics, Legal Aspects and Medical Terminology
1) Role Definition and Interaction, Ethical, Moral, and Legal Responsibilities
2) Medical terminology
3) Medical waste Management

**UNIT-IV**

Contemporary Ethical and Legal Issues In Health Care: Legal regulation of a standalone diagnostic center, medico-legal cases and medical negligence, ethical aspects of health care.
Balancing Individual and Community Interests
Ethics and Health Promotion

**UNIT-V**

Role of Human Rights in Public Health
Ethics of Health Promotion and Disease Prevention

**Reference books:**

1.Ethics and Public Health – Archana Rani Sahoo &Patitapaban Das -2017
2.Public Health,Ethics and Equity-Sudhir Anand, Fabienne Peter and Amartya Sen – 2006
3.Nursing and healthcare ethics-Robinson & Doody-6th edition -2022
4.Ethics- William K.Frankena – 2nd edition-2015

## CLINICAL POSTING:45 days of hospital duty is mandatory

## SEMESTER –V

## PLASTER TECHNOLOGY – II

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Plaster technology – II | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Types of plasters and techniques used | Remember |
| | Necessity of different kinds of deformities | Understand |
| | Procedures of application of POP | Apply |
| | Outcomes of different types of plaster techniques | Analyze |
| | Treatment response | Evaluate |
| | New and appropriate technique for fracture management | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Plasters
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

1. Functional Cast Bracing
2. Moulding of cast
3. Wedge correction of limb deformities
4. Correctmethodofapplyingslabsand casts
5. Plasterremoval

6. Complication of cast
7. Plastercutterandassociatedinstruments
8. Castingand splinting
9. Typesofplasteritsadvancement

**Reference books:**


1. Plaster application by Rajendra Kumar Kanojia
2. "Principles of Orthopaedic Practice" by David J. Dandy and Dennis J. Edwards
3. "Orthopaedic Casts and Splints: Indications and Techniques" by Robert W. Bucholz and Charlie Jobin

# OPERATION ROOM TECHNIQUES – II

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Operation room techniques – II | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | The basic requirements of equipment's in OT | Remember |
| | Importance of hygienicity and safety measures for OT | Understand |
| | OT specifications | Apply |
| | The case and its surgical requirements | Analyze |
| | The hygiene conditions for OT and ethics in OT | Evaluate |
| | To formulate new case specific conditions in OT for surgery | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Plasters
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

1.Checkoutprotocol

2.Handling of Bio waste and Hazardous body fluids and parts.

3.Maintenance of surgical instruments

4.Sterilization: Definition, classification of sterilization, importance of sterilization, sterilizingagents, physical methods

5.Sterilization and disinfection of equipment

6.Basic sterility protocol in operation theater

7.Positioning of patients on OT table

8.Radiation sources and protection from hazards.

9.Sutures material

A. Absorbable - Surgical catgut, collagen sutures, synthetic absorbable sutures etc.

B. Nonabsorable-silks,cotton,polyamide,polypropylene,stainlesssteeletc.

10.Basic suturing techniques and surgical knots

11. How to use C-Arm for common orthopaedics procedure

**Reference books:**

1.OperationTheatreTechniques by RashmiS.Patil
2. "Alexander's Care of the Patient in Surgery" by Jane C. Rothrock
3. "Berry & Kohn's Operating Room Technique" by Nancymarie Phillips

## IMMUNOLOGY AND BACTERIAL SEROLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Immunology and bacterial serology | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Recall basic concepts and terminology related to immunology and bacterial serology. | Remember |
| | Comprehend the fundamental principles of immunology and bacterial serology. | Understand |
| | Utilize the principles of immunology to understand and interpret various immune-related diseases and disorders | Apply |
| | Evaluate the effectiveness and limitations of different serological tests in diagnosing bacterial diseases. | Analyze |
| | Assess the strengths and weaknesses of different immunological and serological techniques. | Evaluate |
| | Create research proposals or protocols for investigating immunological mechanism | Create |

Taxonomy: Remember, Understand, Apply, Analyse, Evaluate, Create

Learning Outcome — On completion of this course, the students will be able to do the following:

1. immunology and bacterial serology
2. immunological mechanism

.

1. History and introduction to immunology

2. Immunity

2.1 Innate

2.2 Acquired immunity

2.3 Basic concepts about their mechanisms

3. Definition, types of antigens and determinants of antigenicity

4. Definition, types, structure and properties of immunoglobulin

5. Antigen-Antibody reactions

5.1 Definition

5.2 Classification

5.3 General features and mechanisms

5.4 Applications of various antigen antibody reactions

6. Principle, procedure and applications of under mentioned in Medical Microbiology:

6.1 Complement fixation test

6.2 Immuno- fluorescence

6.3 ELISA

6.4 SDS-PAGE

6.5 Western blotting

7. Principle, procedure and interpretation of various serological tests:

7.1 Widal

7.2 VDRL

7.3 ASO

7.4 CRP

7.5 Brucella tube agglutination

7.6 Rose-Waaler

8. Complement system:

8.1 Definition

8.2 Basic concepts about its components

8.3 Complement activation pathways

9. Immune response:

9.1 Introduction

9.2 Basic concepts of Humoral and Cellular immune responses

10. Hypersensitivity:

10.1 Definition

10.2 Types of hypersensitivity reactions

11. Basic concepts of autoimmunity and brief knowledge about autoimmune diseases

12. Automation in diagnostic serology

13. Vaccines:

13.1 Definition

13.2 Types

13.3 Vaccination schedule

13.4 Brief knowledge about _Extended programme of immunization‘(EPI) in India

**Practical**

1. Collection of blood sample by vein puncture, separation and preservation of serum

2. Performing Haemolysin titration for Rose-Waaler test

3. Preparation of Phosphate buffers, Verinol buffer, ASO buffer, Richardson‘s buffer,

Buffers of different pH and Molarity, Tris buffer, Standardization of cell concentration

by Spectrophotometer

4. Performance of Serological tests i.e.

4.1 Widal,

4.2 Brucella Tube Agglutination,

4.3 VDRL (including Antigen Preparation),

4.4 ASO (Anti-Streptolysin _O‘)

4.5 C-Reactive Protein (Latex agglutination)

4.6 Rheumatoid factor (RF) Latex agglutination

4.7 Rose Waaler test,

5. Demonstration of antigen/antibody determination by Immuno fluorescence (IF), Immunodiffusion, precipitation in Agarose gel (Ouchterlony), CCIEP, ELISA, SDS-PAGE and Western blotting.

**Suggested Readings:**


1. Practical Medical Microbiology by Mackie & McCartney Volume 1 and 2
2. Text book of Microbiology by Ananthanarayanan
3. Medical Microbiology by Paniker& Satish Gupte
4. Medical laboratory Technology Vol. I ,II, III by Mukherjee
5. Medical Laboratory manual for tropical countries Vol II Microbiology by Monica
Cheesbrough
6. Immunology by Riot
7. Basic & Clinical Immunology by P. Daniel Fudenberg. H. Hugh and Stites


## COMMON ORTHOPEDIC PROCEDURES – II

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Core | Common orthopedic procedures – I | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Memorize the steps involved in pre-operative and post-operative care for orthopaedic procedures. | Remember |
| | Understand the rationale behind common orthopedic procedures and their impact on patient outcomes | Understand |
| | Apply the knowledge of surgical instruments, implants, and sterile techniques during orthopedic procedures. | Apply |
| | Analyze pre-operative assessments and diagnostic tests to determine the need for orthopedic procedures. | Analyze |
| | Evaluate the effectiveness of different orthopedic procedures in addressing specific conditions | Evaluate |
| | Design protocols and guidelines to improve the quality and safety of orthopedic procedures. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome — On completion of this course, the students will be able to do the following:

1. Plasters
2. Prevent fatalities & injuries
3. Complex medical and surgical emergencies management.

1.Forearm plating

2.Interlock nailing tibia fracture

3.Interlock nailing of femur fracture

4.DHS for IT fracture

5.Surgical debridement of compound fracture

6.SSG for wound defect

7.Carpal tunnel Release

8.Ganglion cyst excision.

9. Injection techniques for

A. Trigger finger

B. De Quervain tenosynovitis

C. Planter fascitis

D. Subacromial bursitis

**Reference books:**

1.Operative techniques in orthopaedic surgery 4 volume set Product Bundle – Illustrated, 1 January 2015 By Sam W Wiesel Samuel W Wiesel (Author)

2.Essentials of Orthopedic Surgery Paperback – Illustrated, 5 October 2010 by Sam W. Wiesel (Editor), John N. Delahay (Editor)

**CLINICAL POSTING:45 days of hospital duty is mandatory**

## DISCIPLINE SPECIFIC ELECTIVE

## MEDICAL PSYCHOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | Evaluation |
|---|---|---|---|---|---|

| | | | | L | T | P | Internal | External | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Discipline Specific Elective | Medical Psychology | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | **CO Statement** | **Taxonomy** |
|---|---|---|
| | Thiscoursecoversvariousaspectsofmedicalpsychology. | Receive |
| | Understand different aspectsofmedicalpsychologyessentialin medical professional. | Respond |
| | Applymedical psychology in clinicalscenarioduringclinical postings. | Value |
| | Use of scientific methods for assessment. | Organize |
| | Identify behaviors& experiences that promote health | Characterize |
| | Follow the skills adapting changes in vision | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes

1. Cognitive thinking
2. Demonstrate skills in communication.
3. Ethical behavior

**UNIT-I**

Introduction to psychology
Intelligence, Learning, Memory, Personality, Motivation

**UNIT-II**

Body integrity- one's body image
Patient in his Milan

**UNIT-III**

Self-concept of the therapist, Therapist patient relationship-some guidelines
Illness and its impact on the patients.

**UNIT-IV**

Maladies of the age and their impact on the patient's own and others concept of his body image.

**UNIT-V**

Adapting changes in vision
Why Medical Psychology needs / demands commitment?

**Reference book:**

1.Fundamentals of Psychology for graduate nurses- P Prakash-1st edition- 2016
2.Modern clinical psychology-Sheldon J.Korchin-2004
3.Psychology – Robert A .Baron&Girishwar Misra-5th edition – 2000
4.Applied psychology for nurses – R Sreevani– 4th edition- 2021

# BIOSTATISTICS & RESEARCH METHODOLOGY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Discipline Specific Elective | Biostatistics & Research Methodology | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | To enable students to present, analyze and interpret data. | Receive |
| | To enable students to use concepts of probability in business situations. | Respond |
| | To enable students to make inferences from samples drawn from large datasets. | Value |
| | To enable students to apply univariate and multivariate statistical techniques | Organize |
| | Revise the issues in ethical research | Characterize |
| | Follow the basic concepts of biostatistics. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. To understand the importance & Methodology for research
2. To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

**UNIT-I**

Introduction to research methods.
Sampling methods

**UNIT-II**

Identifying research problem
Developing a research proposal

**UNIT-III**

Ethical issues in research

**UNIT-IV**

Research design
Types of Data

**UNIT-V**

Basic Concepts of Biostatistics
Research tools and Data collection methods

**Reference books:**

1.Research methodology- CR K othari& Gaurav Garg – 4th edition – 2019
2.Introduction to research methodology – Bhanwar Lal Garg, Renu Kavdia, Sulochana Agarwal & Umesh kumar Agarwal – 2019
3.Research methodology for health professionals – RC Goyal – 2nd edition – 2023
4.Research Methodlogy and applied statistics – DN Sansanwal - 2020

# ABILITY ENHANCEMENT COURSE

## ENTERPRENEURSHIP DEVELOPMENT

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement course | Entrepreneurship Development | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| CO Number | CO Statement | Taxonomy |
|---|---|---|
| | Inspire students and help them imbibe an entrepreneurial mind-set. | Receive |
| | Respond entrepreneurship impacted the world and their country. | Respond |
| | Introduced to key traits and the DNA of an entrepreneur | Value |
| | Organize the opportunity to assess their own strengths | Organize |
| | Understand the DNA of an entrepreneur and assess their strengths and weaknesses from an | Characterize |
| | Receive knowledge of Entrepreneurial perspective | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes

1. Develop awareness about entrepreneurship and successful entrepreneurs.
2. Develop an entrepreneurial mind-set by learning key skills such as design, personal selling, and communication.
3. Understand the DNA of an entrepreneur and assess their strengths and weaknesses from an
4. Entrepreneurial perspective.

## UNIT-I

**Introduction to Entrepreneurship**

Meaning and concept of entrepreneurship, the history of entrepreneurship development, role of entrepreneurship in economic development, Myths about entrepreneurs, agencies in entrepreneurship management and future of entrepreneurship types of entrepreneurs.

## UNIT-II

**The Entrepreneur**

Why to become entrepreneur, the skills/ traits required to be an entrepreneur, Creative and Design Thinking, the entrepreneurial decision process, skill gap analysis, and role models, mentors and support system, entrepreneurial success stories.

## UNIT-III

**E-Cell**

Meaning and concept of E-cells, advantages to join E-cell, significance of E-cell, various activities conducted by E-cell

## UNIT-IV

**Communication** Importance of communication, barriers and gateways to communication, listening to people, the power of talk, personal selling, risk taking & resilience, negotiation.

## UNIT V

Introduction to various forms of business organization (sole proprietorship, partnership, corporations, Limited Liability Company), mission, vision and strategy formulation.

**Reference Books:**

1:Title Entrepreneurial DevelopmentAuthor S S Khanka Edition reprint Publisher S. Chand Publishing, 2006

2: Entrepreneurship Development and Business Ethics Paperback – 1 January 2019by Abhik Kumar Mukherjee and Shaunak Roy Author

3: Margie Lovett Scott, Faith Prather. Global health systems comparing strategies for deliveringhealth services. Joney& Bartlett learning, 2014

4:Taxmann'sEnterpreneurship development – CA(Dr.)Abha Mathur- 2021.

# INTRODUCTION TO QUALITY & PATIENT SAFETY

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Ability Enhancement course | Introduction to Quality & Patient Safety | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes the Quality assurance and management | Receive |
| | Discuss the Basics of emergency care and life support skills | Respond |
| | Demonstrate the processes used in developing communication &Impact of communication skills on Organizational design | Value |
| | Define the Infection prevention and control | Organize |
| | Revise the Antibiotic Resistance | Characterize |
| | Follow the skills required for Disaster preparedness and management - Fundamentals of emergency management, | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

Use healthcare data and analytics to measure healthcare quality and patient safety and plan improvement measures.

Participate in research projects that can lead to quality improvement, risk reduction and enhanced patient safety within the healthcare system.

## UNIT-I

**Quality assurance and management** – Concepts of Quality of Care, QualityImprovement Approaches,StandardsandNorms,IntroductiontoNABHguidelines

## UNIT-II

**Basics of emergency care and life support skills**- Basic life support (BLS), Vitalsignsandprimaryassessment,Basicemergencycare–firstaidandtriage,Ventilations Including use of bag-valve-masks (BVMs), Choking, rescue breathing methods, One-andTwo-rescuerCPR

## UNIT-III

**Bio medical waste management and environment safety -**Definition of Biomedical Waste, Waste minimization, BMW – Segregation, collection, transportation, treatment and disposal (including color coding), Liquid BMW, Radioactive waste, Metals/ Chemicals / Drug waste, BMW Management & methods of disinfection, Modern Technology for handling BMW, Use of Personal protective equipment (PPE), Monitoring & controlling of cross infection (Protective devices)

## UNIT-IV

**Infection prevention and control -**Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)], Prevention & control of common healthcare associated Infections, Components of an effective infection control program, Guidelines (NABH and JCI) for Hospital Infection Control

## UNIT V

**Antibiotic Resistance -** History of Antibiotics, How Resistance Happens and Spreads, Types of resistance- Intrinsic, Acquired, Passive, Trends in Drug Resistance, Actions to Fight Resistance, Bacterial persistence, Antibiotic sensitivity, Consequences of antibiotic resistance.
Disaster preparedness and management - Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness and risk reduction, information management, incident command and institutional mechanisms.

**Reference books:**

1.Handbook of healthcare quality & patient safety- Girdhar J Gyani & Alexander Thomas – 2nd edition- 2017

2.Total quality management in the healthcare industry:An efficient guide for healthcare management- Balasubramanian Mahadevan – 2022
3.Step by step Quality Hospital Care- Farooq Jan- 1st edition – 2013
4.Patient safety and healthcare improvement Willey Blackwell- 1st edition - 2014

## SEMESTER –VI

## PHYSIOTHERAPY IN ORTHOPEDICS

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Physiotherapy in orthopedics | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Memorize the common orthopaedic conditions and injuries that require physiotherapy intervention. | Remember |
| | Understand the pathophysiology and underlying mechanisms of orthopaedic conditions. | Understand |
| | Apply appropriate assessment techniques to evaluate the functional limitations and impairments in orthopaedic patients. | Apply |
| | Evaluate and interpret clinical and diagnostic findings to develop effective physiotherapy treatment plans. | Analyze |
| | Evaluate the progress and outcomes of physiotherapy interventions in orthopaedic patients. | Evaluate |
| | Create individualized exercise programs and rehabilitation protocols for specific orthopaedic conditions. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

1. Develop a comprehensive understanding of the anatomy and biomechanics of the musculoskeletal system.
2. Demonstrate knowledge of common orthopaedic conditions, injuries, and their underlying pathophysiology.
3. Apply evidence-based practice principles to physiotherapeutic assessment and treatment techniques in orthopaedics.

1. **Introduction to physiotherapy**
2. Types, Technique of application, indications, contraindications, effects and uses of the following:-
   A) Active movement
   B) Passive movement
   C) Active assisted movement
   D) Resisted movement
   E) Manual muscle testing
   F) Soft tissue manipulation
   G) Relaxation
   H) Therapeutic Gymnasium
   I) Hydrotherapy
   J) Traction
   K) Stretching exercises
   L) Strengthening exercises
   M) Joint mobilization
3. Electrotherapy: - Indications, contraindications, precautions, operational skills of equipment and patient preparation:
   A) Moist heat and electrical heating pads
   B) Short Wave Diathermy
   C) Infra-red rays
   D) Ultra-violet rays (UVR)
   E) Ultra sonic therapy
   F) Transcutaneous Electrical Nerve stimulation (TENS)
   G) Interferential Therapy (IFT)
   H) Electrical Muscle Stimulation
   I) Paraffin Wax Bath
4. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation.

5. Epidemiology of disability with emphasis on loco-motor disability, its implications – individual, family, social, economic and the state.
6. Rehabilitationofpatientafterrecoveryfromtrauma/injury/Operativeprocedure

**Practical :**

1. Preparationof POPbandages
2. PreparationofvariousPlaster Slabs
3. Castingand Splintingtechniques
4. ApplicationofPadding
5. Special Plasters(CTEV, FCB, PTB,HipSpica,etc)
6. PlasterRemoval(HandSaw,MachineSaw)
7. Plastercutterandassociatedinstruments
8. Suturingmaterial andvarioussuturingtechniques
9. Painting,Drapinginthe OT
10. Basic use of C-Arm in OT
11. Basic use of Surgical Instruments
12. BasicphysiotherapyofUpper andLowerlimbs

**ReferenceBooks:**


1. "Orthopaedic Physical Assessment" by David J. Magee
2. "Orthopaedic Rehabilitation Clinical Advisor" by Derrick Sueki and Jacklyn Brechte

# BIOMECHANICS IN ORTHOPEDICS

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Biomechanics in orthopedics-I | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Recall and describe the basic concepts and principles of biomechanics. | Remember |
| | Understand the application of biomechanics in orthopaedics and its relevance to musculoskeletal function. | Understand |
| | Apply biomechanical techniques and tools to assess and measure joint kinematics, forces, and muscle activity. | Apply |
| | Analyze the biomechanics of normal and abnormal movement patterns in orthopaedic conditions. | Analyze |
| | Evaluate the effectiveness of biomechanical interventions in improving movement and function in orthopaedic patients. | Evaluate |
| | Create individualized biomechanical treatment plans based on assessment findings and patient goals. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Biomechanics.
2. The effectiveness of biomechanical interventions
3. Create individualized biomechanical treatment.

1. Introduction to Biomechanics
    - Basic principles of biomechanics
    - Applications of biomechanics in orthopedics
    - Laws of motion and their relevance to musculoskeletal biomechanics
2. Skeletal Biomechanics
    - Structure and mechanical properties of bone
    - Load distribution and stress analysis in bones
    - Bone adaptation and remodeling
3. Joint Biomechanics
    - Anatomy and mechanics of different joints (e.g., knee, hip, shoulder)
    - Joint stability and range of motion
    - Articular cartilage biomechanics
4. Muscular Biomechanics
    - Muscle structure and function
    - Muscle-tendon unit mechanics
    - Muscle force generation and control
5. Biomechanics of Orthopedic Implants
    - Design and mechanics of orthopedic implants
    - Fixation methods and biomechanical considerations
    - Implant-bone interface and implant performance evaluation
6. Biomechanics of Orthopedic Injury and Fracture Healing
    - Mechanisms of injury and fracture patterns
    - Fracture healing process and factors affecting healing
    - Biomechanical analysis of fractures and fracture fixation
7. Gait Analysis
    - Analysis of human gait and its clinical applications
    - Measurement techniques for gait analysis
    - Gait abnormalities and their biomechanical implications
8. Biomechanical Evaluation and Modeling
    - Experimental techniques in biomechanics

- Computer modeling and simulation in orthopedics
- Biomechanical testing and validation methods

9. Clinical Applications of Biomechanics in Orthopedics
    - Biomechanical considerations in orthopedic surgery
    - Rehabilitation and therapeutic interventions based on biomechanical principles
    - Biomechanics in sports medicine and injury prevention

**Practical:**

1. Under and handling of various joints
2. Mechanics of bone
3. Musculoskeletal system

**ReferenceBooks:**

1. "Basic Biomechanics" by Susan J. Hall
2. "Biomechanics and Motor Control: Defining Central Concepts" by Mark L. Latash
3. "Clinical Mechanics and Kinesiology" by Janice Kaye Loudon and Robert C. Manske

# PLASTER ROOM ETHICS

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Plaster room ethics | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Memorize ethical considerations and guidelines for patient confidentiality, informed consent, and privacy in the plaster room | Remember |
| | Understand the importance of ethical decision-making and professional behavior in the plaster room setting. | Understand |
| | Apply ethical decision-making frameworks to resolve ethical dilemmas encountered in the plaster room setting. | Apply |
| | Analyze the ethical implications of different plaster room practices and procedures. | Analyze |
| | Evaluate the effectiveness of ethical guidelines and procedures in the plaster room environment. | Evaluate |
| | Create strategies and guidelines to promote ethical practice in the plaster room. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. Ethical considerations
2. Importance of ethical decision-making
3. Promote ethical practice.

1. Introduction to Plaster Room Ethics
    - Overview of ethical principles in healthcare

- Importance of ethical considerations in the plaster room setting
- Ethical decision-making frameworks

2. Patient Autonomy and Informed Consent
    - Respect for patient autonomy and decision-making capacity
    - Consent process for plaster application and removal
    - Communication of risks, benefits, and alternatives
3. Confidentiality and Privacy
    - Protection of patient information in the plaster room
    - Handling of patient records and documentation
    - HIPAA regulations and patient privacy rights
4. Professional Boundaries and Relationships
    - Maintaining professional boundaries with patients
    - Addressing potential conflicts of interest
    - Recognizing and managing dual relationships
5. Cultural Competence and Diversity
    - Understanding cultural beliefs and practices related to plastering
    - Providing culturally sensitive care in the plaster room
    - Addressing cultural and linguistic barriers
6. Ethical Issues in Plaster Room Practices
    - Allocation of limited resources (e.g., casting materials, equipment)
    - Ethical considerations in pain management during plastering
    - Infection control and prevention practices
7. Ethical Dilemmas and Case Studies
    - Discussion of real-life ethical dilemmas in the plaster room
    - Analysis and resolution of ethical conflicts
    - Ethical decision-making in challenging situations
8. Legal and Ethical Responsibilities
    - Understanding legal obligations related to plastering

- Professional codes of ethics for plaster technicians
- Reporting and addressing unethical behaviors

9. Ethical Considerations in Plaster Room Research and Education
    - Ethical principles in research involving plaster techniques
    - Ethical considerations in teaching and mentoring
    - Informed consent and patient involvement in research or educational activities

**ReferenceBooks:**


1. "Ethics in Health Services and Policy: A Global Approach" edited by Dean M. Harris
2. "Clinical Ethics: A Practical Approach to Ethical Decisions in Clinical Medicine" by Albert R. Jonsen, Mark Siegler, and William J. Winslade
3. "Ethics, Professionalism and Healthcare: Transforming Education and Practice" edited by Mary R. Anderlik and David C. Thomasma


# PROFESSIONALISM AND VALUES

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Professionalism and values | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Remember the importance of integrity, honesty, and accountability in professional settings. | Remember |
| | Grasp the concept of professional ethics and its role in decision-making and behaviour. | Understand |
| | Demonstrate ethical decision-making skills in professional contexts. | Apply |
| | Analyse the consequences of unethical behaviour on individuals and organizations. | Analyze |
| | Evaluate the ethical standards and practices within specific professions or industries | Evaluate |
| | Design programs or initiatives to enhance ethical awareness and behavior in professional settings. | Create |

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create

Learning Outcome

On completion of this course, the students will be able to do the following:

1. integrity, honesty
2. Importance of ethical decision-making
3. Promote ethical practice.

1. Professional values – Integrity, Objectivity, Professional competence and due care, confidentiality
2. Personal values – ethical or moral values

3. Attitude and behavior – professional behavior, treating people equally

4. Code of conduct, professional accountability and responsibility, misconduct

5. Differences between professions and importance of team efforts

6. Cultural issues in the healthcare environment

**Suggested Readings**

1. R. R. Gaur, R. Sangal, G.P. Bagaria, 2009, a Foundation Course in Value Education.

2. E.F. Schumacher, 1973, Small is Beautiful: A study of Economics as if people mattered, Blond & Briggs, Britain.

3. A. Nagraj, 1998, Jeevan VidyaekParichay, Divya Path Sansthan, Amarkantak.

4. P.L.Dhar, R.R.Gaur, 1990, Science and Humanism, Common wealth Publishers.

5. A.N. Tripathy, 2003, Human Values, New Age International Publishers

6. E G Seebauer& Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press

7. B. P. Banerjee, 2005, Foundations of Ethics and Management, Excel Books.

**CLINICAL POSTING: 45 days of hospital duty is necessary.**

## DISCIPLINE SPECIFIC ELECTIVE

## HOSPITAL MANAGEMENT

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Hospital Management | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes the Ability to use disciplines and concepts required in formulating, implementing and evaluating strategic choices in health care | Receive |
| | Discuss the Knowledge of key options in the policy, planning and financing of health care services | Respond |
| | Demonstrate theUnderstanding of the diversity of international health policies | Value |
| | Define International and comparative views on solutions and best practices | Organize |
| | Revise the Practical experience in managerial issues | Characterize |
| | Follow the skills required for Long-run orientation in problem analysis and solving | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Objective

1. To provide an environment that enables students to benefit and learn nuances of Hospital Management from their collective learning experiences.
2. To offer opportunities to develop the ability to think analytically and build capacity for independent learning.

**UNIT-I**

**Quality Concepts:** Definition of Quality, Dimensions of Quality, Basic concepts of Total Quality Management, Quality Awards. Accreditations for hospitals: Understanding the process of getting started on the road to accreditation, National and International Accreditation bodies, overview of standards- ISO (9000 & 14000 environmental standards), NABH, NABL, JCI, JACHO.

**UNIT-II**

**Hospital Information System:** Hospital Information System Management and software applications in registration, billing, investigations, reporting, ward management and bed distribution, medical records management, materials management and inventory control, pharmacy management, dietary services, management, information processing. Security and ethical challenges.

**UNIT-III**

**Inventory Control:** Concept, various costs of inventory, Inventory techniques-
ABC, SDE/VED Analysis, EOQ models. Storage: Importance and functions of storage. Location and layout of stores. Management of receipts and issue of materials from stores, Warehousing costs, Stock verification.

**UNIT-IV**

**Operations management:** Hospital equipment repair and maintenance, types of maintenance, job orders, equipment maintenance log books, AMCS, outsourcing of maintenance services, quality and reliability, concept of failure, equipment history and documents, replacement policy, calibration tests, spare parts stocking techniques and polices

**UNIT-V**

**Biomedical Waste Management:** Meaning, Categories of Biomedical Wastes, Colour code practices, Segregation, Treatment of biomedical waste-Incineration and its importance. Standards for waste autoclaving, microwaving. Packaging, Transportation & Disposal of biomedical wastes.

**Reference books:**

1.Hospital and patient care management – Dr Vidhya Srinivasan & Dr Akshay Ch. Deka – 2022
2.Hospital management & administration – BV Subrahmanyam – 2018
3.Hospital management- Manisha Saxena – volume 3 – 2018
4.Hospital management – Ashvini Arun Vora – 1st edition - 2018

# BASICS OF CLINICAL SKILL LEARNING

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |
| | Core | Basics of clinical Skill Learning | 3 | 3 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes the After successful accomplishment of the course, the students would be able to Measure Vital Signs | Receive |
| | Discuss the Do basic physical Examination of the patients, NG tube basics, Administration of Medicines | Respond |
| | Demonstrate theThe students will learn about Asepsis and the Cleanliness related to asepsis and on mobility of the patients. | Value |
| | Define the They will also learn on the Basics of Nasal-Gastric Tube | Organize |
| | Revise the Also they will know about clean lines in the Asepsis | Characterize |
| | Follow the skills required for They will also learn on the Basics of Nasal-Gastric Tube. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. To Understand and the basic ideas on how to check for Vital Signs of the Patient
2. They will also learn on the Basics of Nasal-Gastric Tube.
3. This course the student will learn how to handle the patients and their positioning

**UNIT- I**

**MEASURINGVITALSIGNS:** Temperature: Axillaries Temperature, Pulse: Sites of pulse, Measurement, Respiratory, Blood Pressure, Pain: Pain Scale

**UNIT-II**

**PHYSICAL EXAMINATION:** Observation, Auscultation (Chest), Palpation, Percussion, History Taking.

**UNIT- III**

**FEEDING: ENTRAL FEEDINGNG TUBE:** Measurement, Procedure, Care, Removal of Nasal-
Gastric Tube, Nasal-Gastric Tube Feeding, and Parenteral Nutrition

**UNIT- IV**

**ASEPSIS:** Hand wash Techniques, (Medical, Surgical) Universal Precaution, Protecting Equipment's: Using Sterile Gloves, opening a Sterile package and Establishing a Sterile Field, Sterile Dressing Changes, Surgical Attire, Wound Dressing, Suture Removal, Cleaning and Application of Sterile Dressing, Wearing and Removal of personal protective Equipment

**UNIT- V**

**MOBILITYANDSUPPORT:** Moving and positioning, range of Motion exercises (Active & Passive) Assisting for Transfer, Application of Restraints.

**Reference books:**

1.Basic surgical skills and techniques – Sudhir Kumar -3rd edition – 2018
2.Essentials of clinical diagnosis – Sunil K Sen-9th edition – 2019
3.Manual of clinical methods – P.S.Shankar – 4th edition – 2017
4.Communication skills in clinical practice – KR Sethuraman- 2nd edition - 2018

## SKILL ENHANCEMENT COURSE

## BASIC AND ADVANCE LIFE SUPPORT

| Course Code | Course Category | Paper Title | Credits | Contact per week | Evaluation |
|---|---|---|---|---|---|

| | | | | L | T | P | Internal | External | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Skill Enhancement Course | Basic and Advance Life Support | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Demonstrate how to open a casualty's airway and check for breathing | Receive |
| | Demonstrate how to place an unresponsive casualty in the recovery position | Respond |
| | Perform Cardiopulmonary Resuscitation using a manikin | Value |
| | Identify safety considerations when using an automated external defibrillator (AED) | Organize |
| | Be able to safely use an automated external defibrillator | Characterize |
| | Follow the skills need to commence Cardiopulmonary Resuscitation (CPR). | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Course Objective

1. Demonstrate how to open a casualty's airway and check for breathing
2. Demonstrate how to place an unresponsive casualty in the recovery position
3. Perform Cardiopulmonary Resuscitation using a manikin
4. Identify safety considerations when using an automated external defibrillator (AED)
5. Be able to safely use an automated external defibrillator

Learning Outcomes

1. Recognize the need to commence Cardiopulmonary Resuscitation (CPR)
2. Assess a casualty's level of consciousnes

**UNIT- I**

Review of anatomy and physiology of blood and cardio vascular system, Assessment-History and Physical assessment • Etiology, Path physiology, clinical manifestations,

**UNIT- II**

- **Diagnosis, treatment modalities of:**

- Vascular system
- Heart Congenital and acquired - Rheumatic Heart diseases

**UNIT- III**

- **Diagnosis, treatment modalities of:**
  - Infective Endocarditic, congenital heart Diseases
  - Cardiac emergencies and arrest
  - Cardio Pulmonary Resuscitation (CPR)

Drugs used in treatment of blood and cardio vascular disorders

**UNIT- IV**

**Basic Life Support**

- Airway Management
- Anaphylaxis
- Approach to Shock

Initial Management of Shock

**UNIT- V**

**Basic Life Support**

- Approach to Syncope
- Approach to Restless Patient
- Approach to Pediatric Patients
- Safe transfer of patients to definitive care areas
- Approach to Trauma Patients

**Reference books:**

1.Basic Life Support-Manual – AHA- 2016
2.Advance Emergency Life Support Protocols – Gireesh Kumar KP – 1st edition – 2015
3.First aid for nurses – TK Indrani- 2nd edition – 2018
4.ACLS Study Guide – Barbara Aehlert – 6th edition - 2022

## ORGANIZATIONAL BEHAVIOUR

| Course Code | Course Category | Paper Title | Credits | Contact per week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Internal | External | Total |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Skill Enhancement Course | Organizational Behaviour | 2 | 2 | - | - | 20 | 80 | 100 |

**Course Outcomes**

After completing this course, the student will be able to:

| | CO Statement | Taxonomy |
|---|---|---|
| | Describes the organizational behavior, types, importance& Fundamental concepts of OB | Receive |
| | Discuss the individual behavior related to motivation and rewards &Characteristics of motives. | Respond |
| | Demonstrate the processes used in developing communication &Impact of communication skills on Organizational design | Value |
| | Define the management of resolving destructive conflicts &Strategies for encouraging constructive conflict. | Organize |
| | Revise the group dynamics, Models and theories of Leadership Styles. | Characterize |
| | Follow the skills required for working in groups (team building) &Importance of Leadership Styles. | Receive |

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome

1. To analyze and compare different models used to explain individual behaviour related to motivation and rewards.
2. To identify the processes used in developing communication and resolving conflicts. to explain group dynamics and demonstrate skills required for working in groups (team building)

**UNIT-I**

OrganizationalBehavior-Definition-Importance -HistoricalBackground-FundamentalconceptsofOB-21stCenturycorporate-DifferentmodelsofOBi.e.autocratic,custodial, Supportive

**UNIT-II**

**Organization Structure and Design**- Authority and Responsibility Relationships - DelegationofAuthorityandDecentralization-InterdepartmentalCoordination-Emerging Trends in Corporate Structure, Strategy and Culture - Impact of TechnologyonOrganizationaldesign-Mechanisticvs AdoptiveStructures –FormalandInformalOrganization

## UNIT-III

**Perception Process -** Nature & Importance - Perceptual Selectivity - Perceptual Organization - Social Perception - Impression Management. Learning-ProcessofLearning-PrinciplesofLearning-OrganizationalRewardSystems –Behavioral Management

## UNIT-IV

**Motivation - Motives - Characteristics -** Classification of motives - Primary Motives - Secondary motives - Morale - Definition and relationship with productivity – Morale Indicators

## UNIT V

**Leadership - Definition** - Importance -Leadership Styles - Models and Theories ofLeadership Styles.

**Conflict Management -**Traditional vis-a-vis Modern view of conflict - Constructive and Destructive conflict - Conflict Process - Strategies for encouraging constructive conflict - Strategies for resolving destructive conflict

**Reference Books:**

1:Human Relations & Organizational Behaviour - R.S.Dwivedi 2007
2:Organizational Behaviour - Uma Sekaran 2005
3:Margie Lovett Scott, Faith Prather. Global health systems comparing strategies for delivering health services.Joney& Bartlett learning, 2014
4:HumanBehaviour at Work - Keith Davis 2004

**SEMESTER – VII & VIII**

## INTERNSHIP

| Course Code | Course Category | Paper Title | Evaluation | |
|---|---|---|---|---|
| | | | Internal | External |
| | Core | INTERNSHIP | 20 | 80 |

**Guidelines:**

1. The internship shall commence after the student has completed and passed all subjects up to VI semesters.
2. The internship is compulsory.
3. The duration of the internship shall be one year.
4. The degree of Bachelor in Allied Health Sciences shall be awarded after the satisfactory completion of the internship.

**Evaluation of Internees:**

**Formative Evaluation:** Day to day assessment of the internees during their internship postings should be done by the Head of the Department/Faculty assigned.

The objective is that all the interns must acquire necessary minimum skills required for carrying out day to day professional work competently. This can be achieved by maintaining Records /Log Book by all internees. This will not only provide a demonstrable evidence of the processes of training but more importantly of the internee's own acquisition of competence as related to performance.

**Summative Evaluation:** It shall be based on the observation of the Sr. Technical staff / Faculty of the department concerned and Record / Log book maintained by the interns.

Based on these two evaluations, the Head of the Department shall issue certificate of satisfactory completion of training, following which the university shall award the degree or declare him/her eligible for it. To implement the project work uniformly for all the specialties in view of the curriculum and training to be acceptable internationally and the students to get opportunity for higher studies and employment.