SYLLABUS

BACHELOR IN TRANSFUSION MEDICINE TECHNOLOGY

4 Years (VIII Semesters)

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

Bachelor of Transfusion Medicine Technology

Learning Objectives:

At the end of the B.Sc. in Transfusion Medicine, the student should be able to:

1. Understand blood transfusion principles, compatibility testing, and reactions for safe practice.

2. Gain proficiency in blood component preparation, storage, and transfusion practices for diverse patients.

3. Recognize and manage transfusion reactions to ensure patient safety.

4. Acquire knowledge of transfusion-transmitted infections and screening procedures.

5. Comprehend the ethical and legal considerations in Transfusion Medicine.

6. Develop skills for blood group typing, antibody screening, and crossmatching.

7. Adapt transfusion practices for special patient populations while adhering to guidelines.

Expectations from the future graduates in providing patient care:

The goal of B.Sc. in transfusion medicine course is to produce a competent transfusion medicine technician who:

1. Demonstrates a comprehensive understanding of blood banking principles, including blood collection, processing, storage, and distribution.

2. Exhibits proficiency in blood typing, crossmatching, and antibody screening techniques to ensure accurate and compatible blood transfusions.

3. Recognizes and manages adverse reactions and complications associated with transfusion therapy to ensure patient safety.

4. Possesses knowledge of transfusion-transmitted infections, screening protocols, and quality control measures to ensure the safety of donated blood products.

5. Adheres to ethical and legal guidelines governing the field of Transfusion Medicine, including informed consent, confidentiality, and professional conduct.

6. Shows competency in the selection and appropriate utilization of blood components for diverse patient populations, considering specific medical conditions and individual needs.

7. Collaborates effectively with healthcare professionals, patients, and donors to facilitate efficient and safe transfusion practices.

8. By achieving these competencies, graduates of the B.Sc. in Transfusion Medicine course are prepared to contribute to the field as competent transfusion medicine technicians, ensuring the availability of safe and compatible blood products for patients in need.

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 Transfusion Medicine Technology	4	3	1	-	20	80	100
	Practical	Practical for all subjects/Clinical Posting	5	-	-	10	10	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 Transfusion Medicine	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 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 –III

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Hematology – I	4	3	1	-	20	80	100
	Core	Blood Banking Organizations	4	3	1	-	20	80	100
	Core	Blood Donation & Doner Management	4	3	1	-	20	80	100
	Core	Hemovigilance	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	Hematology – II	4	3	1	-	20	80	100
	Core	Transfusion Transmitted Infections	4	3	1	-	20	80	100
	Core	Transfusion Techniques	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	2	-	-	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- 32**						
***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	Blood Components	4	3	1	-	20	80	100
	Core	Transfusion Therapy	4	3	1	-	20	80	100
	Core	Blood Bank equipment's	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	-		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	Blood Banking Documentation & Quality Control	4	3	1	-	20	80	100
	Core	Apheresis Technique & Therapeutic Procedures	4	3	1	-	20	80	100
	Core	Recent Advances in Transfusion Medicine	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	20	80
	Core	Internship	20	80

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'Transfusion Medicine 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 Statement	Taxonomy
	Describe the anatomy & terminology of cell, tissues of body Skin & its Blood supply.	Remember
	Explain the blood circulation system & skeleton system with Classification of bones, Parts of developing long bone.	Understand
	Determine the muscular system, Muscles of Upper limb, Muscles of lower limb, Muscles of Neck, Muscles of back & joints.	Apply
	Analyse the respiratory system with Bronchopulmonary segments & circulatory system: Types of blood vessels, Heart& Pericardium.	Analyse
	Assess the digestive system, role of digestive juices & enzymes & reproductive system: spermatogenesis & oogenesis.	Evaluate
	Formulate the excretory system Pathway of glomerulousfilteration 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
2. Demonstrate and understand the basic anatomy of Respiratory and Circulatory system
3. Demonstrate and understand the basic anatomy of Digestive and Excretory system
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

Introduction to Anatomy: Anatomical terms, planes, organization of human body- cell, tissue, organ & organ system.

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

Anatomy of the Nervous system

Central nervous system & Peripheral nervous system- different components

UNIT-II

Anatomy of Circulatory system:

General plan of circulatory system and its components-

Heart- size, location, coverings, chambers, blood supply, nerve supply, the blood vessels

General plan of circulation, pulmonary circulation

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

Anatomy of the Digestive system:

Anatomy of alimentary tract; Parts of the tract

Accessory glands of digestion; Pancreas, Liver, Gall Bladder

Anatomy of Excretory system Kidneys- location, gross structure, excretory ducts, ureters, urinary bladder, urethra

UNIT-IV

Reproductive system:

Male Reproductive System

Female Reproductive System Anatomy of the endocrine system

UNIT-V

Endocrine system:

Name of all endocrine glands their positions

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

HUMAN PHYSIOLOGY

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

Course Outcomes

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

	CO Statement	Taxonomy
	Describe the basic physiology of hematology, Homeostasis, Hemopoiesis, Hemogram, Anemia, Body Fluid, Immunity.	Remember
	Explain the basic physiological concept of cardiovascular system, functions, properties of cardiac muscle, Origin of Cardiac Impulse.	Understand
	Determine the nerve – muscle physiology, neuromuscular junction & Mechanism of muscle contraction & central nervous system.	Apply
	Analyze the Physiologic anatomy, functions of respiratory system, Mechanism of respiration & circulatory system.	Analyze
	Assess the physiology of digestive system Composition and functions of all Digestive juices, Movements.	Evaluate
	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
2. To understand the basic physiological concepts of Hematology
3. To understand the basic physiological concepts of Nerve-Muscle physiology.
4. To understand the basic physiological concepts of Respiratory physiology.
5. To understand the basic physiological concepts of Cardiovascular physiology

UNIT-I

General Physiology

- Cell, Transport across cell membrane, homeostasis, resting membrane potential, action potential
- Blood
- Composition and functions of Blood
- RBC, WBC, Platelet count, Hemoglobin
- Blood Groups - ABO and RH grouping
- Hemostasis & Anticoagulants

UNIT-II

Cardio vascular system

- Cardiac muscle, Pacemaker & conducting tissue
- Cardiac Cycle
- Cardiac output, Heart rate, ECG
- Arterial blood pressure
- Respiratory System
- Functions of Respiratory system
- Mechanism of respiration, lung volumes & capacities

UNIT-III

Nerve & Muscle physiology

- Neuron structure & properties
- Neuromuscular junction
- Skeletal muscle structure mechanism of contraction
- Cerebrospinal Fluid (CSF): Composition, functions & Circulation.
- Central & autonomic Nervous system Organization of CNS
- Functions of various parts of Brain, in brief
- Composition, functions and circulation of CSF
- Differences between sympathetic and parasympathetic division

UNIT-IV

Digestive system

- Functional Anatomy, organization & innervations
- Composition and functions of all Digestive juices
- Digestion & Absorption of carbohydrates, proteins and fats

UNIT-V

Excretory System

- Kidneys: Functions, Nephron, Juxta-glomerular Apparatus
- Renal circulation
- Mechanism of Urine formation
- GFR
- Endocrine and Reproductive systems Endocrine glands & hormones secreted

- 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 Statement	Taxonomy
	Describe the biomolecules Introduction and scope of biochemistry, Chemistry of carbohydrates, proteins, lipids.	Remember
	Explain the metabolism of glucose, fats & amino acids & their regulatory pathways.	Understand
	Determine the structure & function of enzymes & its clinical importance	Apply
	Analyze the RDA, Sources of Vitamins and Minerals, functions and deficiency of Fat-soluble vitamins.	Analyze
	Assess the balanced diet, Satiety value, Energy imbalance- obesity, starvation, Limitations of the daily food guide.	Evaluate
	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.
2. Explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.
3. Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP.
4. Describe how fats and amino acids are metabolized, and explain how they can be used for fuel.

UNIT-I

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

UNIT-II

- **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.
- **Proteins:** Definition, sources, amino acids, structure of protein, their classification, simple protein, conjugated protein, derived proteins and their properties.

UNIT-III

- **Enzymes:** Definitions, mechanism of action, factors affecting enzyme action, enzyme of clinical importance.
- **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

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

UNIT-V

- **Protein Metabolism**: Transamination, Deamination, Fate of ammonia, urea synthesis and its inborn errors.
- **Nucleic Acid Metabolism**
- **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 SK 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 TRANSFUSION MEDICINE 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 Cath Lab Tech	4	3	1	-	20	80	100

Course Outcomes:

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

	CO Statement	Taxonomy
	legal and ethical challenges in healthcare.	Receive
	Students explore the legal, ethical and moral issues in healthcare professionals. Identify issues related to potential legal liability in the workplace.	Respond
	To introduce students to the discipline of public health	Value
	To give an overview of the methods of prevention and health promotion	Organize
	To understand the determinants and measures of disease and health related states	Characterize
	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
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.
3. Able to understand complex healthcare public policy from all sides of an issue, regardless of your personal beliefs.

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

UNIT- VI

- 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.

Reference books:

1.Medical Ethics – CM Francis – 4th edition – 2020
2.Medical Ethics challenges and prospects in India –Subrata Sharma– 2012
3.Medical Ethics – a very short introduction – Michael Dunn & Tony Hope- 2nd edition – 2018
4.Textbook of medical bioethics attitude and communication for medical students – Motilal C Tayade – 2020

ENVIRONMENTAL SCIENCE AND 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 Statement	Taxonomy
	Describes the components of Environment, basic concepts of Ecosystem & interaction of man & environment.	Receive
	Discuss the Global environment problems, biodiversity loss, deforestation & desertification.	Respond
	Demonstrate the environmental pollution with impact & control strategies of pollution in urban, rural & industrial areas.	Value
	Define the environmental management, concept of health sanitation, environmental disease.	Organize
	Revise the Environmental Protection Act, Environmental laws, National movements, environmental ethics.	Characterize
	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.
2. Sample an ecosystem to determine population density and distribution.
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 Programme-**Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

UNIT-III

- **IntroductiontoAYUSHsystemofmedicine-**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 – SamtaSoni- 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 –II

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 Statement	Taxonomy
	Describes the Classification of microorganisms, size, shape and structure of bacteria & Use of microscope in the study of bacteria.	Remember
	Explain the classification & different methods with advantages and disadvantages of the various methods infection control measures.	Understand
	Determine the immunology & perform serological tests or microbiological laboratory procedures.	Apply
	Analyse the etiological agents of global infectious diseases, causative agents, transmission methods, investigation, prevention & control.	Analyse
	Assess the clinical relevance of bacteriology, parasitology mycology & virology.	Evaluate
	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:

1. Knowledge of microorganisms and the disease process as well as aseptic and sterile techniques.
2. Perform microbiological laboratory procedures according to appropriate safety standards

UNIT-I

Microorganisms

- Classification-Prokaryotes, Eukaryotes, Viruses, Fungi
- Morphology-size, shape, arrangement
- Special characteristics–spores, capsules, enzymes, mortality, reproduction
- Gram staining, ZN staining
- Different types of microscopes.

UNIT-II

Sterilization

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

Disinfection

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

UNIT-III

Asepsis

- Universal Precautions
- Use of aseptic precautions to prevent infection,
- Safety mechanisms including vaccination in prevention of blood borne infections, Hospital acquired infections

UNIT-IV

Virology with special reference to hepatitis, poliomyelitis, HIV & Influenza

UNIT-V

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

GENERAL PATHOLOGY

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
	Describes basis of systemic pathology & morphology of common disorders.	Remember
	Explain the general principles of hematology & histopathology techniques.	Understand
	Determine the general principle of cytopathology techniques & universal safety precaution.	Apply
	Analyse the general principles of clinical pathology techniques, autopsy & museum.	Analyse
	Assess the clinical information of accurate pathology diagnosis.	Evaluate
	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.
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 groups

- ABO system, Rh system, Blood transfusion- Indication, transfusion reactions.
- Anemias-classification, morphological and Etiological, effects of anemia on body.

Practicals

1. Collection of blood Samples
2. Various instruments used in Hematology
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 Hematology – Dr Tejinder Singh -2017
3: Essentials in Hematology & Clinical 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	1	-	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Describe the mechanism of anti-anginal drugs, hypertension, arrhythmias & partial or complete heart failure.	Remember
	Explain the pharmacotherapy of insomnia & importance of new generation anti-histaminic drugs over old generation antihistamines.	Understand
	Determine the corticosteroids & drugs which inhibit acid formation to prevent acidity and stomach/peptic ulcer.	Apply
	Analyse the anti-thrombotic agents, lipid lowering agents & anti-atherosclerotic agents.	Analyse
	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, 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.
2. Also, recent advances in pharmacology will play a key role in research aspect of the students

UNIT- I

General Pharmacology

- Absorption, distribution, metabolism and elimination of drugs,
- routes of drug administration.
- Adverse reactions to drugs.
- Factors modifying drug response

UNIT- II

Autonomic nervous system & Peripheral nervous system

- Sympathetic nervous system - sympathomimetics, sympatholytics
- Parasympathetic - Cholinergics, Anticholinergics Drugs
- Skeletal muscle relaxants
- Local anesthetics

UNIT- III

Central nervous system

- Drug therapy of various CNS disorders like epilepsy, depression.
- Non-steroidalanti-inflammatory drugs
- General anesthetics
- Autocoids
- Histamine and antihistaminic

UNIT- IV

Cardiovascular system

- Drug therapy of hypertension, shock, angina, cardiac arrhythmias
- Diuretics
- Coagulants and anticoagulants, antiplatelet drugs
- Hypo-lipidemics

Gastrointestinal and respiratory system

- Drug treatment of peptic ulcer
- Drug therapy of bronchial asthma

UNIT- V

- Hormones
- Drug therapy of Diabetes
- Corticosteroids
- Chemotherapeutic agents - b- Lactam Antibiotics, fluoroquinolones, aminoglycoside, tetracyclines, chloramphenicol

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 methods

Reference Books:

1: Padmaja Uday Kumar – 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 TRANSFUSION MEDICINE

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the basic principles and concepts of transfusion medicine, including blood components, blood groups, compatibility testing, and transfusion reactions.	Remember
	Demonstrate comprehension of the different blood typing systems and their clinical significance, as well as the procedures and techniques involved in blood collection, processing, and storage.	Understand
	Apply the knowledge and skills acquired to perform blood typing and compatibility testing accurately, ensuring the safe selection of appropriate blood products for transfusion.	Apply
	Analyze transfusion reactions and complications to identify their causes, symptoms, and appropriate management strategies. Evaluate the impact of these reactions on patient outcomes.	Analyse
	Evaluate the effectiveness of transfusion practices by critically assessing hemovigilance data, identifying areas for improvement, and implementing quality assurance measures to ensure safe transfusion practices.	Evaluate
	Develop and implement protocols and procedures for transfusion medicine practices, incorporating the latest advancements and technologies.	Create

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

Learning Outcomes

1. Understand blood types, compatibility testing, and safe transfusion practices.
2. Identify and manage transfusion reactions and complications.
3. Apply knowledge to select appropriate blood products for transfusion.
4. Evaluate and improve transfusion practices for patient safety and optimal outcomes.

UNIT-I

- Donor Motivation, Motivational Techniques, Social Marketing, Preparation of IEC Materials
- Donor recruitment & Retention: Types of blood donors, Donor selection, medical interview and medical examination, screening for hemoglobin estimation, Managing deferred blood donors, technique for conversion of first-time donor into regular voluntary donor, donor felicitation.

UNIT-II

- Blood collection room equipment, their principles, and use, emergency medicines, Pre-donation counseling, donor phlebotomy, post donation care, post donation counseling
- Screening of Blood units for mandatory tests, discarding infected units
- Blood Donation drive: Awareness programs prior to Blood donation drive, Camp site, staff requirement management of camp, transportation of Blood units from camp site to blood center
- Preservation of donated Blood, Blood preservation solutions, Additive solutions
- Aphaeresis procedures, Aphaeresis products, preparation of multiple products on cell separators, Maintenance of cell separator equipment
- Autologous Blood donation.

UNIT-III

- Selection of Blood bags for component preparation, preparation of red cell concentrate, Fresh Frozen plasma, platelet concentrate, cryoprecipitate, washed red cells, Frozen red cells.
- Plasma Fractionation: Principles, manufacturing of different plasma derivatives.

UNIT-IV

- Component Testing, Labeling.
- Transportation and storage of Blood components.
- Preparation of leuko-reduced Blood products, Leukocyte filters, plasma extractors.
- Metabolic changes in blood components during storage, release of cytokine during storage.

UNIT-V

- Inventory management and maintenance of Blood stock.
- Irradiated blood components.
- Blood substitutes
- Measurement of factor VIII level in FFP.
- Measurement of fibrinogen level in FFP.
- Sterility test on platelet concentrates.
- Sterility test on whole Blood.
- Measurement of pH and other platelet parameters.

- Aphaeresis procedures

Reference Books:

1. Text book of Pathology. *Author :*Harsh Mohan.
2. Test books of laboratory technology. *Author :*Praful Godkar.
3. Practical Pathology. *Author :*Harsh Mohan.
4. Modern Blood banking & Transfusion Practices - Denise M. Harmening Seventh Ed.

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 managementtechniques.

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

- Medical Audit: itsprocess, role and importance in hospitals.

Reference Books:

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

SEMESTER –III

HEMATOLOGY-I

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall basic concepts of hematological disorders, blood cell morphology, and laboratory tests.	Remember
	Comprehend the pathophysiology of hematological diseases and interpret diagnostic laboratory results.	Understand
	Apply knowledge to diagnose and manage hematological conditions and interpret blood smears.	Apply
	Analyze complex cases to determine appropriate treatment strategies for various hematological disorders.	Organize
	Evaluate the effectiveness of treatment plans and interpret laboratory findings to monitor disease progression.	Evaluate
	Develop research proposals or case studies on emerging trends and advancements in hematology.	Create

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

Learning Outcomes:

After completion of the course:

1. Students will be able to know the basic concepts of Hematology & routine clinical investigations of Hematology laboratory.

2. It also deals with the study of preparation of different types of anticoagulants and their mode of action.

UNIT1

Introductionofhematology

Introduction of hematology Blood and composition, hematopoiesis, RBC count MCV MCH, MCHC, ESR, PCV, WBC Count, DLC, PLT Count and Hemoglobin. Anticoagulants used in hematology and mode of action, Steps in hematology investigation

UNIT II

Erythrocytedisordersandlaboratorydiagnosis

Anemia: Anemia, Introduction, Classification, Microcytic hypochromic anemia, Macrocytic anemia, Normocytic normochromic anemia. LE- Cell Phenomenon, Reticulocyte Sickling tests, Osmotic fragility test, Investigation ofG6PDdeficiency, Hemoglobinopaties

UNIT III

Leukocytesdisordersandlaboratory diagnosis

Leukemia- Definition, types, cause&laboratorydiagnosisofleukemias,Chromosomalstudiesinvarioushematological disorders and their significance Lymphomas and multiple myelomas- their causes, identification andclinicalfeatures.

UNIT IV

HomeostasisandHemorrhagicdisorders

Normal homeostasis, mechanism of coagulation, coagulation regulation, hyper coagulable states, Role of platelets inhaemostatic, platelets function test, Platelets disorders Introduction Causes of bleeding disorders, Vascular defectPlatelet defect,Factor deficiency,Inhibitors,Hyper fibrinolysis, Types of bleeding disorders,Inherited bleedingdisorders, Acquired bleeding disorders, Thrombosis, Introduction, Causes of thrombosis Hemophilia A, B & Von-Willebrand disease,DIC,Platelet disorder (Qualitative and quantitative)Laboratory approach for investigatingthrombosis.

Practical

1. Determination ofHemophiliaAand B
2. StudythemorphologyofSicklingtests
3. DeterminationofRBCcount.
4. DeterminationofWBCcount.
5. DeterminationofDLC.
6. DeterminationofHb byCMGmethod.
7. DeterminationofPCV
8. Determination ofESRby Westergren method and Wintrobemethod.
9. DeterminationofBTand CT
10. DeterminationofPTandAPTT

Reference Book

- HarshMohan,TextBookofPathology.P.Godkar
- Practical pathology P.Chakraborthy
- PracticalHematologybyJBDacie

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BLOOD BANKING ORGANIZATIONS

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the roles and functions of blood banking organizations.	Remember
	Comprehend the processes involved in blood collection, testing, storage, and distribution.	Understand
	Apply appropriate protocols for blood component preparation and selection for transfusion.	Apply
	Analyse compatibility test results and interpret blood group discrepancies.	Organize
	Evaluate the quality and safety measures implemented by blood banking organizations.	Evaluate
	Design strategies to ensure efficient inventory management and emergency response in blood banking organizations.	Create

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

Learning Outcomes:

After completion of the course:

- Ensure donor eligibility and safe blood collection.
- Provide compatible blood products for transfusion.
- Implement quality assurance programs for blood testing and storage.
- Monitor and report adverse reactions and transfusion-related complications

UNIT-I

Historyof TransfusionMedicine

- Identifyand relatethe important features of thehistoryof transfusionmedicine
- Outlinethe scientificbenchmarks in theevolutionoftransfusion medicine-
- Explainhowspecificinnovations affectedtransfusionmedicinepractice
- Describerecenttrendsinthepracticeoftransfusionmedicine

HistoryofdevelopmentTransfusionMedicineinIndia

- Wholeblood,Components&Apheresis,Recent developments

UNIT-II

- Organization of blood bank services regional blood transfusion centers, Blood banks andblood storage centers, Blood Bank premises and infrastructure. Mandatory Technical Staffingpatternofblood bankand role, functions and responsibilityof each technical staff.
- Technicalrequirements:Accommodationandenvironmentalconditions,Bloodbankmanagement system,Regulationsforbloodbankoperation,Drugsandcosmetics Law, National blood policy, standards in Blood Banking, licensing procedures, ethical aspects ofbloodtransfusion
- Statutory regulatorsofBloodbanking inIndia-DrugcontrollerofIndia,State,DirectorGeneralHealth services&NACO.

UNIT-III

- Indian Drugsand cosmeticactandrules1945pertainingto the Bloodbank.
- Indian &otherPharmacopeiapertainingtobloodproducts.
- Licensing norms, Inspections andCompliance.
- Terminologiesused in blood banking including blood donation.

UNIT-IV

- Introductionbloodand blood products.
- IntroductiontoBloodbank equipment
- Weights,Volume.Specific gravity, Conversion ofweighttovolume,Volumedilutions,Weightdilutions etc.
- Etiquetteand discipline tobemaintained inblood bank
- ReportingFormatsandstatistics

Practical:

1.To study the analysis of blood groups.

2.Detremination of Rh-factor

3.Study of hemoglobin analysis by hemoglobinometer

4.Determination of TLC

5.Determination of DLC

6.Determination of BC

7.Determination of BT and CT

Reference books:

- HarshMohan,TextBookof pathology. P.Godkar
- Practical pathology P.Chakraborthy
- PracticalHematologybyJBDacie

BLOOD DONATION & DONER MANAGEMENT

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Blood Donation & Doner Management	4	3	1	-	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall key concepts of blood donation and donor management.	Remember
	Explain the process and procedures involved in blood donation and donor management.	Understand
	Implement appropriate strategies for effective blood donation and donor management.	Apply
	Assess the suitability of potential donors and identify potential risks or issues.	Analyze
	Critique the effectiveness of donor management practices and suggest improvements.	Evaluate
	Develop comprehensive protocols and guidelines for efficient blood donation and donor management.	Create

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

Learning Outcomes:

After completion of the course:

- Understand donor eligibility and selection criteria for safe blood donation.
- Demonstrate proficiency in donor screening and blood collection techniques.
- Apply appropriate donor management strategies to ensure donor safety and well-being.
- Comply with regulatory and ethical guidelines in blood donation practices.

UNIT-I

- Donor Motivation, Motivational Techniques, Social awareness, Preparation of IEC Materials.Blooddonation Motivatingfactors for donation
- Typesofblooddonors,Donorselection,
- Donorquestionnaireandinterview:Eligibilityanddeferralcriteria,medicalinterviewandmedicalexamination
- Pre-donation Investigations-hemoglobinestimation&Bloodgrouping
- Equipment &Reagents usedinscreening,investigations.

UNIT-II

- Managingrejectedblooddonors, a techniqueforconversionoffirst-time donorsintoregularvoluntarydonors,donorfelicitation.
- Donorrecruitment &Retention.
- Pre-donation&Postdonationdonor counselling.

UNIT-III

- Medico-legalAspects,NACO&DGHSguidelines.
- Righttoinformation,DonorConsent,reports, Leaveletters,certificates
- Bloodcollectionroomequipment,theirprinciples,anduse,emergencymedicines,
- Pre-donation counselling, Solutions & Method for Preparing Phlebotomy Site, Test TubeSamples–Methodofaccuratelyrelatingproducttodonorbleedingofthedonor,postdonationcare.

UNIT-IV

- Mandatory emergency medicines to be made available and their uses. Donor reactions andtheirmanagement.
- Screeningofbloodunitsformandatorytests,discardinginfectedunits,postdonationcounselling.
- Blood Donation drive: Awareness programs prior to blood donation drive, Camp site, staffrequirement, management of camp, transportation of blood units from camp site to bloodbank.
- Different types of Blood Collection – Autologous blood donation, Therapeutic PhlebotomyPreservationofdonated blood, blood preservationsolutions, Additive solutions.
- Bloodsalvaging.

Practicals

1. Donor Motivation, Motivational Techniques, Social Marketing, Preparation of IEC Materials.
2. Donor recruitment & Retention: Types of blood donors, Donor selection, medical interview and medical examination, screening for hemoglobin estimation, Managing rejected blood donors, technique for conversion of first-time donor into regular voluntary donor, donor felicitation.
3. Blood collection room equipment, their principles, and use, emergency medicines, Pre-donation counseling, Bleeding of the donor, post donation care, post donation counseling.
4. Screening of blood units for mandatory tests, discarding infected units.
5. Blood Donation drive: Awareness programs prior to blood donation drive, Camp site, staff requirement management of camp, transportation of blood units from camp site to blood bank.
6. Preservation of donated blood, blood preservation solutions, Additive solutions.
7. Aphaeresis procedures, Aphaeresis products, preparation of multiple products on cell separators, Maintenance of cell separator equipment.
8. Autologous blood donation.

Reference books:

- HarshMohan,TextBookof Pathology. P. Godkar
- Practical pathology P.Chakraborthy
- PracticalHematologybyJBDacie

HEMOVIGILANCE

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

Course Outcomes

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

	CO Statement	Taxonomy
	List key components of hemovigilance.	Remember
	Describe the purpose of hemovigilance	Understand
	Demonstrate the application of hemovigilance principles	Apply
	Analyze transfusion-related data for safety monitoring.	Analyze
	Assess the effectiveness of hemovigilance processes.	Evaluate
	Develop a comprehensive hemovigilance program	Create

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

Learning Outcomes:

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

- The student will learn the transfusion technique with the aspect of hemovigilance.

UNIT-I

- History of hemovigilance, hemovigilance system of different countries, hemovigilance program in India.

UNIT-II

- Objectives of hemovigilance programs in India, objectives, enrollment centers

UNIT-III

- Software used for hemovigilance data privacy and security, documentation and reporting

UNIT-IV

- Responsibility of medical and nursing staff of HPVI centers, departmental responsibilities.

UNIT-V

- Custodian record keeping, CDSCO responsibilities.

Practicals:

1.Assisting clinician for transfusion.
2.Blood group analysis.
3.Study of Rh factor of the patients.
4. Follow-up and monitoring of patients after transfusion.
5. Maintaining medical record of the patients gone for transfusion.

Reference books:

- HarshMohan,TextBookof Pathology.P.Godkar
- Practical pathology P.Chakraborthy
- PracticalHematologybyJBDacie

GENERAL PRINCIPLES AND PRACTICES OF PUBLIC HEALTH/ FORENSIC PSYCHOLOGY

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
	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) 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) Injuries and Personal protection, Insulation and safety procedures)Aseptic techniques, sterilization and disinfection.d)Disinfection and Sterilization of devices and equipment) Central sterilization and supply departmentf) 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 f)Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep g) Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher. h) 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 techniques) 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	2	2	-	-	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.	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. Laryngoscopes2. Endo-tracheal tubes (ETT), boogie3. Ambu bag and mask4. 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 tray8. Suction apparatus9. Pulse oximeter10. EtCO2 monitor11. Oxygen pipe-line and medical gas cylinders, pipelines and manifold12. Ambulance (Cervical) Collar, Philadelphia Collar

UNIT-II

- **Introductions to Emergency Services**

Principles of resuscitation

1.Sudden cardiac death2. Cardiac, respiratory arrest3. Basic cardiopulmonary resuscitation in adults, neonates, pediatrics& pregnancy.4. Advanced cardiac life support

UNIT –III

- **Specific resuscitative procedures**

1. Airway management2. Breathing and ventilation management3. Venous and intraosseous access4. Defibrillation and cardioversion5. Fluid and blood resuscitation6. Vasoactive agents in resuscitation7. Arrhythmias

UNIT-IV

1. Medical emergencies 2. Fluids and electrolytes 3. Respiratory Emergencies 4. Gastrointestinal Emergencies5. Cardiovascular Emergencies6. Central Nervous System Emergencies7. Genito urinary emergencies8. Hematological Disorders9. Endocrine and Metabolic Emergencies

UNIT-V

- **Emergency Drugs** - Drug introduction, indication, contra-indications, side – effects and routes of administration with doses of following drugs: 1) Toxicology 2) Emergencies due to venomous bites and stings: 3) Industrial Hazards 4) Obstetrical emergencies 5) Mental Health Emergencies G) 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-IV

HEMATOLOGY-II

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall basic concepts of hematological disorders, blood cell morphology, and laboratory tests.	Remember
	Comprehend the pathophysiology of hematological diseases and interpret diagnostic laboratory results.	Understand
	Apply knowledge to diagnose and manage hematological conditions and interpret blood smears.	Apply
	Analyze complex cases to determine appropriate treatment strategies for various hematological disorders.	Analyse
	Evaluate the effectiveness of treatment plans and interpret laboratory findings to monitor disease progression.	Evaluate
	Develop research proposals or case studies on emerging trends and advancements in hematology.	Create

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

Learning Outcomes:

After completion of the course:

1. Students will be able to know the basic concepts of Hematology & routine clinical investigations of Hematology laboratory.

2. It also deals with the study of preparation of different types of anticoagulants and their mode of action.

UNIT-I

- Bloodcollection
- Anticoagulantsused in Hematology
- Normalvalues inHematology

UNIT-II

- BasicHematologicalTechniques:RBCcount,Hemoglobinestimation,Packedcellvolume.
- Calculationofabsoluteindices:WBCcounts-Totalanddifferential,Absoluteeosinophilcount,Platelet count, Erythrocytesedimentationrate, Reticulocytecount
- Preparationofbloodfilms
- Stainsused in Hematology

UNIT-III

- Morphologyof bloodcells
- ClassificationofAnemia(Morphological&etiological)Definition,causes,classification&labfindings ofIron DeficiencyAnemia,MegaloblasticAnemia, Hemolytic Anemia
- BoneMarrow:Cellcomposition ofnormaladultBonemarrow

UNIT-IV

- Leukemia:Classification
- Urineexamination:Physical,Chemical &Microscopic
- Examinationofbodyfluids,cell counts

Practicals:

- Study the collection of blood
- Study of hemocytometer, Haemoglobinometry white blood cell count, red blood cell count,
- Determination of blood groups.
- Leishman's staining and differentiate WBC counts.
- Determination of packed cell value
- Calculation of blood indices, fragility test for R.B.C.
- Blood pressure recording auscultation for heart sounds, artificial respiration determination of vital capacity.
- PreparationofLEcells

- HbElectrophorosis

Reference books:

- HarshMohan,TextBookof Pathology.P.Godkar
- Practical pathology P.Chakraborthy
- PracticalHematologybyJBDacie

TRANSFUSION TRANSMITTED INFECTION

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Transfusion Transmitted Infection	4	3	1	-	40	60	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall common transfusion-transmitted infections.	Remember
	Explain the modes of transmission for different transfusion-transmitted infections.	Understand
	Apply appropriate screening and testing methods for transfusion-transmitted infections.	Apply
	Analyse the impact of transfusion-transmitted infections on patient safety.	Analyse
	Evaluate the effectiveness of preventive measures for transfusion-transmitted infections.	Evaluate
	Develop protocols to minimize the risk of transfusion-transmitted infections.	Create

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

Learning Outcomes:

After completion of the course:

- Identify common transfusion-transmitted infections and their associated risks.
- Apply appropriate screening and testing methods to detect transfusion-transmitted infections.
- Evaluate strategies to prevent and manage transfusion-transmitted infections effectively.
- Demonstrate understanding of regulatory requirements and ethical considerations related to transfusion-transmitted infections.

UNIT-I

- Study of major transfusion transmitted infection:
- Epidemiology and pathogenesis of Hepatitis B, C Human immunodeficiency viruses 1 and 2, HTLV viruses I and II West Nile virus(WNV).
- Implication of the other viral diseases for blood transfusions: Emerging infections like Epstein-Barr virus, cytomegalovirus (CMV), parvovirus B19 and Creutzfeldt-Jakob disease. Transfusion associated infectious organisms.

UNIT-II

- Malaria &others. Syphilis and other pathogens.
- Lab diagnosis of Malaria and syphilis by various methods and principles of each test.
- Interpretation of non- Treponemal and Treponemal antibody tests used to diagnosesyphilis.
- Transfusion associated infections with other bacterial / fungal / protozoal infections.

UNIT-III

- ELISA test Various types of ELISA Laboratory screening tests for TTI, Spot tests,
- Limitation of various tests Quarantine and recipient tracing, procedures for lookback and recipient follow-up Compare & contrast various methodologies such as ELISA, rapid &Chemiluminescence used in screening of transfusion transmitted infections.

UNIT-IV

- National policy on TTI testing of blood donors.
- Automation in Blood donor screening Chemiluminescence, NAT, Western Blot
- Automation in blood donor TTI screening. Confirmatory tests for TTI testing.
- Demonstrate proficiency in the preparation and use of internal control in transfusion transmitted infection screening

Practicals:

1. Serological Testing: Serological tests are performed to detect antibodies or antigens in blood samples.
2. a. HIV (Human Immunodeficiency Virus) Testing: Use ELISA (Enzyme-Linked Immunosorbent Assay) or rapid antibody tests to detect HIV antibodies in the blood.

   b. Hepatitis B and C Testing: Conduct serological tests to detect hepatitis B surface antigen (HBsAg) and hepatitis C antibodies (anti-HCV) in blood samples.

   c. Syphilis Testing: Perform the Treponema pallidum particle agglutination assay (TPPA) or Rapid Plasma Reagin (RPR) test to detect antibodies against syphilis.
3. Nucleic Acid Testing (NAT): NAT techniques detect the presence of viral genetic material (RNA or DNA) in blood samples.

   a. Polymerase Chain Reaction (PCR): Amplify and detect viral nucleic acids using PCR-based techniques like real-time PCR or reverse transcription PCR (RT-PCR).
4. Blood Donor Screening

5. Quality Control and Assurance
6. Blood Component Preparation

Reference books:

1. "Transfusion Microbiology" by Michael P. Busch and Christopher D. Hillyer
2. "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" by Beth H. Shaz, Christopher D. Hillyer, and Morayma Reyes Gil
3. "Transfusion Transmitted Infections: Emerging and Re-emerging Infectious Diseases" edited by Yudhvir Singh and Vijay Kumar
4. "Transfusion Medicine: A Clinical Guide" by Christopher D. Hillyer, Leslie E. Silberstein, et al.
5. "Transfusion Medicine" by Steve Kitchen, Bjarte G. Solheim, and Geoff Daniels

TRANSFUSION TECHNIQUES

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Transfusion Techniques	4	3	1	-	40	60	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the basic principles of transfusion.	Remember
	Explain the different blood typing methods.	Understand
	Perform blood compatibility testing.	Apply
	Identify and manage transfusion reactions.	Analyse
	Assess the quality and safety of transfusion.	Evaluate
	Develop strategies for hemovigilance.	Create

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

Learning Outcomes:

After completion of the course:

- Demonstrate proper blood collection and processing techniques for transfusion.
- Perform accurate blood typing and compatibility testing to ensure safe transfusion practices.
- Apply appropriate administration and monitoring methods during blood product transfusions.
- Evaluate and respond to transfusion reactions and complications in a timely and effective manner.

UNIT-I

- Automation in blood banking.
- Nucleic Acid Testing.
- Aphaeresis
- Stem Cells
- Coagulation & transfusion medicine

UNIT-II

- Principles of coagulation & procedures.
- Sample collection, preparation & storage for hemostasis test.

UNIT-III

- Lab diagnosis of bleeding disorders including platelet function abnormalities.
- All overview of hyper coagulable states % lab investigations for the same.
- DIC- an overview & lab investigation for the same.
- Automation in the coagulation lab.
- Quality assurance in the coagulation lab.

Practicals:

- Clotting time.
- Clot retraction & clot lysis
- Bleeding time
- PT
- APTT correction studies
- Factor assays
- Platelet function tests
- Principles of blood groups & antigen antibody reactions.
- Genetics in blood banking.
- ABO & Rh blood group systems.
- Other red cell antigens & their antibodies-clinical significance.
- Red cell compatibility testing.
- Coombs tests-significance
- Antibody identification.
- Hemolytic disease of new born
- Blood donor selection, screening.
- Transfusion transmitted diseases & their lab diagnosis.
- Blood collection & preservation including cryopreservation.
- Blood components, preparation, indications, storage and autologous transfusions.
- Transfusions in transplantation, neonatology.
- Blood substitutes.

- Blood donor motivation.
- Auditing in blood banks.
- Auditing in blood banks.
- Quality assurance in blood banking practices.
- HLA- theory importance in transplantation, disease associations & basic techniques used in tissue typing.
- Compatibility testing-cross matches.
- Investigation of transfusion reactions.
- Investigation of hemolytic disease of new born.
- HBsAg& HIV antibody testing in blood bank.

Reference Books

1. Modern blood banking and transfusion practices by Denise M Harmening, 5th Edi.
2. Transfusion medicine technical manual- DGHS, Ministry of Health and Family Welfare, Govt. of India, Second edition, 2003.
3. Blood transfusion in clinical medicine by PL Mollison.
4. AABB technical manual, 17thed, AABB.
5. Compendium of transfusion medicine, RN Makroo.
6. National guide book in blood donor motivation. NACO, Ministry of Health and Family Welfare, Govt. of India.
7. Standards for blood banks and blood transfusion services, NACO, Ministry of health and Family Welfare, Govt. of India, New Delhi 2007.
8. Voluntary blood donation program NACO, Ministry of Health and Family Welfare, Govt. of India, New Delhi, 2007.

ENVIRONMENTAL & BIOMEDICAL WASTE MANAGEMENT; ENTREPRENEURSHIP & PROFESSIONAL MANAGEMENT

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Environmental & Biomedical Waste Management; Entrepreneurship & Professional Management	4	3	1	-	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall waste classification and segregation methods.	Remember
	Explain the regulations and guidelines for handling biomedical waste.	Understand
	Demonstrate proper techniques for waste disposal and treatment.	Apply
	Analyze the potential risks associated with improper waste management.	Analyse
	Evaluate waste management practices and suggest improvements.	Evaluate
	Design a comprehensive waste management plan for a healthcare facility.	Create

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

Learning Outcomes:

After completion of the course:

- Develop knowledge of regulations and practices for proper handling, disposal, and treatment of environmental and biomedical waste.
- Apply strategies to minimize environmental impact and ensure the safe management of biomedical waste.
- Evaluate and implement waste management plans to promote sustainability and compliance with environmental standards.
- Apply principles of professional management, including leadership, communication, and ethical decision-making.

UNIT-I

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

(B) Solid Waste Management

a. Introduction to solid waste
b. Its collection and disposal
c. Recovery of resources
d. Sanitary land-filling
e. Vermin-composting
f. Hazardous waste management

UNIT-II

3(A). Land Pollution

a. Soil conservation
b. Land erosion
c. Afforestation

(B) Ecology

a. Busies of species
b. Biodiversity
c. Population dynamics
d. Energy flow
e. Ecosystems

4(A). Social Issues and the Environment

a. Sustainable development and life style
b. Urban problems related to energy
c. Resettlement and rehabilitating of people
d. Environmental ethics
e. Consumerism and waste products

(B) Water Harvesting and Rural Sanitation

a. Water harvesting techniques
b. Different schemes of Rural Water Supply in Rajasthan
c. Rural Sanitation
d. Septic Tank
e. Collection and disposal of wastes
f. Bio-gas
g. Community Awareness and participation

UNIT-III

Entrepreneurship & Professional Management

1. Entrepreneurship:

a. Definition, basic concept, need, scope and characteristics of entrepreneurship.
b. Woman entrepreneurship.
c. Assistance to small scale from enterprises national level organizations like SIDO, NSIC, NRDC, KVIC.
d. Assistance to small scale enterprises from State level organizations like DOL, DIG, RFC, SISI, RHDC, Pollution Control Board, Rajasthan khadi& Village Industries Board, banks etc.
e. Facilities to women entrepreneurs.

2. Emerging Areas in Entrepreneurship:

a. Innovation & Creativity.
b. Introduction to Intellectual Property Rights (IPRs) & Parents.
c. National Knowledge Commission: basic concept needs and scope.
d. Service sector: scope future trends.
e. Energy and Auditing.

3. Project Formulation process:

a. Steps in planning a small-scale enterprise.

b. Structure of project report.

c. Analysis of sample, project reports

d. Preparation of project reports.

e. Techno-economic and feasibility of the project.

4. Financial sources for SSI Loan:

a. State Govt. RFC, Credit facility by banks.

UNIT-IV

5. Rules and Regulations:

a. Licensing and registration procedure.

b. Important provisions of Factory act.

c. Shop & Commercial Establishment Act.

d. Sales of Goods Act.

e. Partnership Act.

f. Value Added tax (VAT).

g. Service tax.

h. Professional tax.

i. Income tax.

j. Sales tax and excise rules.

k. Municipal bye laws and insurance coverage.

6. Meaning and Scope of Business:

a. Definition of profession, trade and Industry.

b. Objective of business and profession.

c. Types of business organization.

d. Brief description, advantage disadvantage of individual – partnership – cooperative private and public limited organizations.

e. Characteristics of small business, business ethics, organization chars.

UNIT-V

7. Management Techniques:

a. Leadership, authority, responsibility.

b. Functions of Management.

8. Quality Control:

a. Meaning, importance of keeping standard.

b. Factor responsible for deviation from standards.

c. ISO and ISO-9000 to 9006.

d. Total quality management.

9. Financial Management:

a. Sources of Finance.

b. Brief idea of cash and credit, Cheque, draft, bill of exchanges, promissory note.

10. Marketing:

a. Basic concept.

b. Market promotion, market promotion.

c. Branding, packaging, planning development.

d. Advertisement media and effectiveness.

e. Sales forecasting, marketing fix – pricing policy, sales promotion and salesmanship.

f. After sales services, complaints and their re-dressal.

11. Human Relations:

a. Motivating the employees.

b. Inter personnel relations.

c. Grievances and their handing.

d. Staff requirement, training and monitoring.

12. Foreign Trade:

a. Export procedure.

b. Channels of distribution in expert trade.

c. Export Promotion.

d. Registration of firm/factory in R.B.I. AEPC or others

Reference Books:

1. ParyavaranShiksha. Author : Dr. A.N. Mathur, Dr. N.S. Rathore, Dr. V.K. Vijay.
2. ParyavaranAdhyayan. Author :Dr. Ram Kumar Gujar, Dr. B.C. Jat
3. ParayavaranAvabodh. Author : Dr. D.D. Ojha.
4. Environmental Chemistry and Pollution Control. Author : S.S. Dora
5. Ecology concepts and application. Author : Manuel C. Muller.
6. Environmental Protection. Author : Emil T. Chanlett.
7. Environmental Science. Author :CuminghamSaigo.
8. Hand book of small scale Industry. Author : P.M. Bhandari.
9. Hand book of entrepreneurship development. Author : O.P. Harkut.
10. Entrepreneurship development. Author : S.S. Khanka.
11. Statistical quality control. Author :ManoharMahajan.
12. ISO: 9000 quality system - 2000. Author :S. Dalela.

CLINICAL POSTING

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Clinical Posting	5	-	-	10	20	80	100

Hospital Training: 45 days mandatory.

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:

3.Communication Skills for the Healthcare Professional, First edition

4.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

INTRODUCTION TO NATIONAL HEALTHCARE SYSTEM

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

Learning Objective

1. To familiarize with the healthcare environment
2. To understand the concepts of management with relevance to hospitals

UNIT I

- Introduction – Theoretical frame work - Environment - Internal and External – EnvironmentalScanning – Economic Environment – Competitive Environment – Natural Environment – Politico Legal Environment – Socio Cultural Environment - International and TechnologicalEnvironment.

UNIT II

- A Conceptual Approach to Understanding the Health Care Systems – Evolution – InstitutionalSetting - 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 – MedicalEducation 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.AnnuBahlMehra& 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 effective 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

SEMESTER-V

BLOOD COMPONENTS

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the different components of blood.	Remember
	Explain the functions of various blood components.	Understand
	Apply knowledge of blood components in clinical scenarios.	Apply
	Analyze the compatibility and interactions of blood components.	Analyse
	Evaluate the appropriateness of blood component selection for transfusion.	Evaluate
	Develop strategies to optimize blood component utilization and management.	Create

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

Learning Outcomes:

After completion of the course:

- Identify: Identify and differentiate various blood components, such as red blood cells, platelets, and plasma.
- Explain: Explain the clinical indications and appropriate utilization of different blood components.
- Demonstrate: Demonstrate proper handling and administration techniques for blood components, ensuring patient safety.

UNIT-I

- Bank IssueCounter,Criteriaforacceptanceofrequisitionform.
- Inspectionandselectionofbloodcomponent.
- Planfortransfusion.Basicstepsincomponentpreparation&labeling.
- Composition&storageComposition:volume,cellular,plasmaandclottingfactorcontent.
- Equipmentusedforcomponentpreparation.
- Selectionofbloodbagsforcomponent preparation.
- Careandprecautionstobetakenduringwholebloodcollectionandbeforecomponentpreparation.

UNIT-II

- Programmingforcomponentpreparation,PRP&Buffycoatmethods&Othermethodsofcomponen t preparation.
- Preparationofredcellconcentrate,FreshFrozenplasma,otherplasmaproductsplateletconcentratio n,cryoprecipitate, washedredcells.
- PlasmaFractionation:Principles,manufacturingofdifferentplasmaderivatives.
- Storageconditionsforcomponents"Storagelesions"-Metabolicchangesinbloodcomponentsduringstorage,releaseofcytokineduringstorage.
- ComponentTesting, Labeling,Transportationand storageofbloodcomponents.

UNIT-III

- Inventorymanagement and maintenanceof blood stock
- Modified blood components: Preparation of leukoreduced blood products,Leukocytefilters, Irradiated blood components, Blood substitutes, Washed /plasma reduced bloodcomponents,frozen redcells.
- Specializedbloodcomponents– CMVfreeandHLAmatched&Bloodsubstitutes,Recombinantclotting & hematopoieticgrowth factors.
- Qualitycontrolofcomponents:MeasurementoffactorVIIIlevelinFFP,Measurementof fibrinogen level in FFP, Measurement of pHand other platelet parameters, Sterilitytest on platelet concentrates, Sterility test on whole blood and Packed red blood cellconcentrate.
- Plasmafractionationproducts&Pathogeninactivationmethods.
- Managementof BloodCriteriaforissue ofbloodand bloodComponents.
- Use of red cell components in different types of anemia, Use of blood components inbleeding patients, Neonatal transfusion, and Transfusion practices in surgery, Selection ofunitsfor cross-matching.

UNIT-IV

- Transfusion therapyforoncologyand Transplantation patients.

- TransfusionindicationsRedbloodcells,Platelets, Plasma/cryoprecipitate,Granulocytes.
- Pre-Transfusion strategies in special cases regarding samples, techniques and protocols inspecial patients' circumstances -Paediatric / neonatal, Obstetric including intra uterine,cardiacsurgery, burn patients &trauma patients.
- Blood administration, transfusion filters, post transfusion care, maximal surgical bloodorderschedule.

UNIT-V

- Immunehaemolyticanaemia,warm&coldtype,druginducedhaemolytic anaemia.
- ThrombocytopeniaImmunethrombocytopenicpurpura.Thromboticthrombocytopenicpurpura.Post transfusionpurpura.
- Fetalandneonatalthrombocytopenia.
- Granulocytetransfusion.
- PlateletrefractorinessRecognitionandevaluation.
- Calculation ofCCIand platelet recovery

UNIT-VI

- TransfusionreactionsDiagnosis,Pathophysiology,Investigations.
- Hemolytictransfusionreaction-immediateanddelayed;immuneandnon-immunereaction path physiology; Clinical signs and symptoms and laboratory investigation forHTR,Transfusion reaction workup.
- Non-hemolytic transfusion reactions immediate and delayed, bacterial contamination,febrilereaction,Allergicreaction, Transfusion-related lunginjury,PTP,Alloimmunization,Ironoverload, Graft versushost disease.
- Current risk & Prevention strategies of transfusion reactions and rational use of bloodcomponents

Reference Books

1. Modern blood banking and transfusion practices by Denise M Harmening, 5th Edi.
2. Transfusion medicine technical manual- DGHS, Ministry of Health and Family Welfare, Govt. of India, Second edition, 2003.
3. Blood transfusion in clinical medicine by PL Mollison.
4. AABB technical manual, 17thed, AABB.
5. Compendium of transfusion medicine, RN Makroo.
6. National guide book in blood donor motivation. NACO, Ministry of Health and Family Welfare, Govt. of India.
7. Standards for blood banks and blood transfusion services, NACO, Ministry of health and Family Welfare, Govt. of India, New Delhi 2007.
8. Voluntary blood donation program NACO, Ministry of Health and Family Welfare, Govt. of India, New Delhi, 2007.

TRANSFUSION THERAPY

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the components and principles of transfusion therapy.	Remember
	Explain the process of blood typing and compatibility testing.	Understand
	Apply appropriate techniques for blood product administration and monitoring.	Apply
	Analyze transfusion reactions and complications and implement appropriate management strategies.	Analyse
	Evaluate the importance of hemovigilance and quality assurance in transfusion therapy.	Evaluate
	Create strategies to ensure patient safety and ethical transfusion practices.	Create

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

Learning Outcomes:

After completion of the course:

- Administer blood products safely and accurately.
- Recognize and manage transfusion reactions and complications.
- Ensure appropriate selection and utilization of blood products based on patient needs.

UNIT-I

- Management of Blood Bank Issue Counter, Criteria for acceptance of requisition form, inspection of blood component prior to issue.
- Blood administration, transfusion filters, post transfusion care, Therapeutic plasma exchange.

UNIT-II

- Judicious use of blood; management of different types of anemia, management of bleeding patient, Neonatal transfusion, transfusion practices in surgery, transfusion therapy for oncology and trans plantation patents.

UNIT-III

- Hemolytic transfusion reaction immediate and delayed; immune and non-immune reaction path physiology; clinical signs and symptoms laboratory invigilation for HTR Tests to defect bacterial contamination in blood.
- Non-hemolytic transfusion reactions immediate and delayed, febrile reaction, allergic reaction, clinical signs and symptoms.

UNIT-IV

- Acute transfusion related lung injury, all immunization, iron overload, graft versus host disease.
- Strategies to prevent transfusion reactions.

Practical:

- Management of Blood Bank Issue Counter, Criteria for acceptance of requisition form, inspection of blood component prior to issue.
- Blood administration, transfusion filters, post transfusion care, Therapeutic plasma exchange.
- Judicious use of blood; management of different types of anemia, management of bleeding patient, Neonatal transfusion, transfusion practices in surgery, transfusion therapy for oncology and trans plantation patents.
- Hemolytic transfusion reaction immediate and delayed; immune and non-immune reaction path physiology; clinical signs and symptoms laboratory invigilation for HTR Tests to defect bacterial contamination in blood.
- Non-hemolytic transfusion reactions immediate and delayed, febrile reaction, allergic reaction, clinical signs and symptoms.
- Acute transfusion related lung injury, all immunization, iron overload, graft versus host disease.
- Strategies to prevent transfusion reactions.

Reference Books

1. Modern blood banking and transfusion practices by Denise M Harmening, 5th Edi.
2. Transfusion medicine technical manual- DGHS, Ministry of Health and Family Welfare, Govt. of India, Second edition, 2003.
3. Blood transfusion in clinical medicine by PL Mollison.

4. AABB technical manual, 17th ed, AABB.
5. Compendium of transfusion medicine, RN Makroo.
6. National guide book in blood donor motivation. NACO, Ministry of Health and Family Welfare, Govt. of India.
7. Standards for blood banks and blood transfusion services, NACO, Ministry of health and Family Welfare, Govt. of India, New Delhi 2007.
8. Voluntary blood donation program NACO, Ministry of Health and Family Welfare, Govt. of India, New Delhi, 2007.

BLOOD BANK EQUIPMENTS

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the functions of blood bank equipment	Remember
	Explain the principles of operation.	Understand
	Demonstrate the proper use of equipment	Apply
	Analyze equipment malfunctions and troubleshooting methods	Analyse
	Evaluate equipment performance and quality control procedures	Evaluate
	Design a blood bank equipment setup	Create

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

Learning Outcomes:

After completion of the course:

- Understand the functions and operation of various blood bank equipment.
- Demonstrate proficiency in using blood bank equipment for blood processing and storage.
- Ensure compliance with safety protocols when operating blood bank equipment.

UNIT-I

- GeneralLab equipment
- Colorimeters&Elisareaders, washers
- Thermometers
- Weighingdevices

UNIT-II

- Refrigerators
- Plateletagitators &Incubators
- Deepfreezers
- Thawingbath&devices

UNIT-III

- Plasmaexpressers
- Sterileconnectingdevices
- Apheresis equipment
- Computers
- Software&Hardware

UNIT-IV

- Temperatureregulatingdevices(Incubators,Hotairoven)
- Autoclaves
- Cellwashers
- HIS
- Automationplatforms

Practicals:

1. Blood Collection Practice:
2. Blood Component Separation:
3. Blood Storage and Temperature Monitoring:
4. Blood Typing and Compatibility Testing:
5. Automated Blood Bank Systems:
6. Quality Control and Maintenance:
7. Safety Protocols and Compliance:
8. Troubleshooting and Problem-solving:
9. Emerging Technologies
10. Practical Assessments

Reference books:

1. "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" by Christopher D. Hillyer, Leslie E. Silberstein, Paul M. Ness, Kenneth C. Anderson, and John D. Roback.
2. "Technical Manual of the American Association of Blood Banks" by Mark K. Fung, Connie M. Westhoff, and Anthony D. Keller.
3. "Handbook of Transfusion Medicine" by Rebecca Cardigan, Geoff Daniels, and Marcella Contreras.
4. "Blood Banking and Transfusion Medicine: Basic Principles and Practice" by Christopher D. Hillyer, Leslie E. Silberstein, Ronald G. Strauss, Naomi L. C. Luban, and Paul M. Ness.
5. "AABB Technical Manual" by Mark K. Fung and Connie M. Westhoff.
6. "Immunohematology and Transfusion Medicine: A Case Study Approach" by Marion E. Reid and Angela E. Gibson.

IMMUNOLOGY

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the fundamental concepts and components of the immune system.	Remember
	Explain the principles and mechanisms of immune responses against pathogens and diseases.	Understand
	Apply immunological knowledge to diagnose and treat immune-related disorders.	Apply
	Analyze experimental data to understand immunological processes and interpret research findings.	Analyze
	Critically evaluate the efficacy and limitations of immunological techniques and therapies.	Evaluate
	Develop innovative approaches and strategies for immunological research and therapeutic interventions.	create

Taxonomy: remember, understand, apply, analyze, evaluate, create

Learning Objectives

1. Understand the basic principles of immunology, including the immune system's components and their functions.
2. Explain the mechanisms of immune responses and how they protect the body against pathogens.
3. Describe the types of immunity, including innate and adaptive immunity, and their roles in disease prevention.
4. Recognize the importance of immunization and its impact on public health.

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Reference books

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 Stite

CLINICAL POSTING

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Practical	Clinical Posting	5	-	-	10	20	80	100

Hospital Training: 45 days 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	3	-	-	3	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 behaviour

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 thebasic 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	2	-	-	2	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 fordeliveringhealth services. Joney& Bartlett learning, 2014

4: Taxmann's Enterpreneurship 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 theprocesses 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 improvementWilley Blackwell- 1st edition - 2014

SEMESTER-VI

BLOOD BANKING DOCUMENTATION & QUALITY CONTROL

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Blood Banking Documentation & Quality Control	4	3	1	-	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the essential documentation requirements for blood banking processes.	Remember
	Demonstrate understanding of quality control procedures in blood banking	Understand
	Apply appropriate documentation practices to ensure accurate and reliable blood banking records.	Apply
	Analyze quality control data to identify and address deviations or deficiencies in blood banking.	Analyse
	Evaluate the effectiveness of documentation and quality control measures in ensuring patient safety	Evaluate
	Create comprehensive quality control protocols for blood banking operations.	Create

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

Learning Outcome

- Understand the importance of accurate documentation in blood banking and its impact on patient safety and transfusion outcomes.
- Apply quality control procedures to ensure compliance with regulatory requirements and maintain the integrity of blood products.
- Evaluate and analyze documentation and quality control data to identify areas for improvement and implement corrective actions.

UNIT-I

- Bloodserology:Variousreagents&Kitsordering,specifications &Documentation
- TTIkitordering,specificationsanddocumentation
- Qualitycontrol,assuranceandmanagement systems.

UNIT-II

- Qualitycontrolofemptybloodbags.QualitycontrolofdifferentbloodbankComponents, sterilitytest on the component.
- Quality control of blood bags, Quality assurance of Hb & PCV, Quality control of bloodgrouping reagents, QC of anti-human globulin reagent, bovine albumin, Normal saline,Antiseraetc.,QC of TTI test kits– ELISA, CLIA&Rapid
- Quality control of all equipment, Calibration, validation and maintenance of blood bankequipment.

UNIT-III

- QCofbloodbanktechniquesQualityAssurance-TemperatureRecords,SterilityTesting.Internal QC andExternal QC
- Quality parameters of various blood components, Quality Assurance blood components – redcells,FFP, cryoprecipitate,platelets, RedCell andWBC contamination.
- Calibration, validation and maintenance of blood bank equipment, QC of blood banktechnique.

UNIT-IV

- Documents,Registers,Records&Formatstobekept.Licensing,Drugauthorities'inspectionand compliance.
- Registersforms,DocumentationandStandardoperatingprocedures(SOPorGMP),Bloodbankman agementsystem,Regulationsforbloodbankoperation,Drugsandcosmetics Law, National blood policy, standards in Blood Banking, licensing procedures,ethicalaspects of blood transfusion.
- Hospital Transfusion Committee. Blood Bank Accreditation-. ISBT, NABL, NABHstandardsandaccreditation.
- Legal and ethical aspects, Regulatory Acts, Biohazard Waste Disposal Act, Nationalbloodpolicy.

Practical:

1. Documentation preparations, Practice accurately documenting donor information, collection details, and processing steps in simulated or real-world scenarios.
2. Learn proper record-keeping techniques, including data entry, timestamping, and maintaining confidentiality and security of sensitive information.
3. Familiarize yourself with the use of electronic documentation systems and software commonly used in blood banking.
4. Standard Operating Procedures (SOPs) preparations
5. Quality control function of pH meter.
6. Centrifugation of samples.
7. Calibration of instruments.

Reference books:

1. "Technical Manual" by AABB (formerly known as the American Association of Blood Banks)
2. "Standards for Blood Banks and Transfusion Services" by AABB
3. "Quality Management in Blood Banking and Transfusion Medicine" by Frank Smart
4. "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" by Christopher D. Hillyer, Leslie E. Silberstein, et al.
5. "Transfusion Medicine: Case Studies and Clinical Management" by Mary Louise Turgeon

APHERESIS TECHNIQUEANDTHERAPEUTIC PROCEDURES

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall the principles of apheresis.	Remember
	Understand the therapeutic applications of apheresis.	Understand
	Apply apheresis techniques in clinical settings.	Apply
	Analyze patient indications for apheresis procedures.	Analyse
	Evaluate the effectiveness of apheresis therapy.	Evaluate
	Create a comprehensive plan for apheresis treatment.	Create

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

Learning Outcome

- Demonstrate proficiency in performing apheresis procedures, including venous access, machine operation, and monitoring patient response.
- Evaluate patient suitability for apheresis therapy and select appropriate therapeutic procedures based on medical indications and contraindications.
- Create a comprehensive plan for the management of apheresis patients, including monitoring, follow-up, and coordination with other healthcare providers.

UNIT-I

- Apheresisprocedures,

- Apheresisproducts
- Maintenanceofcell separatorequipment.
- Plateletpheresis

UNIT-II

- Leukapheresis
- Granulocyteconcentrates
- Peripheralhematopoieticblood stem
- Therapeutic Procedures
- Venous assess for therapeutic plasma exchange

Practical:

1. Familiarization with the different components of the apheresis machine and their functions.
2. Hands-on practice in setting up and calibrating the apheresis machine.
3. Training on operating the machine, including adjusting flow rates, monitoring parameters, and
4. troubleshooting technical issues.
5. Venous Access and Catheter Placement:
6. Practical experience in performing different types of apheresis procedures, such as plasmapheresis, plateletpheresis, leukapheresis, and red blood cell exchange.
7. Hands -on training in proper patient positioning, aseptic technique, and patient monitoring during
8. the procedure.

Reference books:

1. "Apheresis: Principles and Practice" by Josef M. Pfeiffer and Hans G. Zingsem.
2. "Therapeutic Apheresis: A Physician's Handbook" by Yanyun Wu and Jeffrey L. Winters.
3. "Practical Transfusion Medicine for the Small Animal Practitioner" by Carolyn A. Sink and Larry D. Cowgill.
4. "Apheresis: Methods, Types and Potential Complications" edited by Leandro F. Esteban and Eric F. Harris.
5. "Apheresis: Principles and Practice" by Ronald M. Sacher and Paul M. Ness.
6. "Practical Guide to Transfusion Medicine" by Christopher Hillyer, Rebecca Haley, and Rob Ratner.

RECENT ADVANCES IN TRANSFUSION MEDICINE

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Recent Advances in Transfusion Medicine	4	3	1	-	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Recall recent advancements in transfusion medicine.	Remember
	Explain the underlying principles of new technologies in transfusion medicine.	Understand
	Apply recent advances in transfusion medicine to clinical scenarios.	Apply
	Analyze the impact of emerging technologies on transfusion safety and efficacy.	Analyse
	Evaluate the benefits and limitations of novel transfusion techniques.	Evaluate
	Propose innovative strategies to enhance transfusion practices based on recent advances.	Create

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

Learning Outcome

- Understand the latest advancements in transfusion medicine technologies and their applications.
- Evaluate the impact of recent advances on transfusion safety, efficacy, and patient outcomes.
- Apply knowledge of recent advancements to improve transfusion practices and optimize patient care.

UNIT-I

- Latesttrendsinbloodbanking-Donorscreening,retention,Bloodcollections,componentsetc.
- Recent advances in automationof BloodBanking.
- NucleicAcidTesting.

UNIT-II

- StemCells
- Cordstemcellbanking.
- Stemcellbanking application.
- Proceduresofcollectionofstemcellandcalculationofstemcellcollected.

UNIT-III

- Qualitycontrol of products.
- Cryopreservation,maintenance,QCandthawingproceduresinstemcellbanking.
- Regenerativemedicine.
- RecentJournals.

Reference books

1. "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" edited by Christopher D. Hillyer, Beth H. Shaz, James C. Zimring, Thomas C. Abshire, and Connie M. Westhoff.
2. "Transfusion Medicine: Case Studies and Clinical Management" by Karen E. King and Neal S. Young.
3. "Transfusion Medicine: A Clinical Guide" edited by Toby L. Simon and Edward L. Snyder.
4. "Handbook of Transfusion Medicine" edited by Hillyer, Silberstein, Ness, and Anderson.
5. "Transfusion Medicine: Quo Vadis?" edited by Cees Smit Sibinga and Paul W. M. Smit Sibinga.

PROFESSIONALISM AND VALUES

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

Course Outcomes

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

	CO Statement	Taxonomy
	Recall key principles of professionalism and ethical values in a professional context.	Remember
	Comprehend the importance of maintaining professional behavior and upholding ethical standards.	Understand
	Demonstrate the ability to apply professional standards and values in real-life situations.	Apply
	Analyze ethical dilemmas and make informed decisions based on professional values.	Analyze
	Assess personal and organizational practices against professional standards and values.	Evaluate
	Develop strategies to foster a culture of professionalism and ethical values in the workplace.	Create

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

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

- Understand the importance of professionalism and ethical behavior in the workplace.
- Demonstrate professionalism through effective communication, punctuality, and respect for colleagues and clients.
- Apply ethical principles and values to make informed decisions and solve problems.
- Foster a positive work environment by upholding professional standards and promoting integrity and trust.

UNIT I

- Professional values – Integrity, Objectivity, Professional competence and due care, confidentiality

UNIT II

- Personal values – ethical or moral values

UNIT III

- Attitude and behavior – professional behavior, treating people equally

UNIT IV

- Code of conduct, professional accountability and responsibility, misconduct

UNIT V

- Differences between professions and importance of team efforts
- Cultural issues in the healthcare environment

Reference books

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

CLINICAL POSTING

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Practical	Clinical Posting	5	-	-	10	20	80	100

Hospital Training: 45 days mandatory.

DISCIPLINE SPECIFIC ELECTIVE

HOSPITAL MANAGEMENT

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Discipline Specific Elective	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 the Understanding 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
	Discipline Specific Elective	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 thestudents 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

LearningOutcome

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. Thiscoursethestudentwilllearnhowtohandlethepatientsandtheirpositioning

UNIT- I

MEASURING VITAL SIGNS: 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 consciousness

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-
Mechanistic 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 of Leadership 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.