

GURU KASHI UNIVERSITY



Diploma in Health Assistant (DHA)

Session: 2026-27

Faculty of Allied & Healthcare

Graduate Attributes of the Program:

Diploma in Health Assistant (DHA) program is designed to develop competent, compassionate, and skilled healthcare professionals capable of supporting preventive, promotive, curative, and rehabilitative health services in community and clinical settings. Graduates of the program will possess sound knowledge of basic medical sciences, public health principles, first aid, patient care, nutrition, sanitation, and disease prevention. They will demonstrate effective communication skills, ethical and professional behavior, teamwork, and the ability to work efficiently with healthcare professionals and community members. The program also aims to develop critical thinking, problem-solving abilities, leadership qualities, and awareness of national health programs to enable graduates to contribute effectively to primary healthcare delivery systems. DHA graduates will be prepared to provide quality healthcare assistance, promote community health awareness, maintain patient safety and confidentiality, and adapt to evolving healthcare technologies and practices while upholding social responsibility and lifelong learning.

The objectives of the program are to:

1. Develop competent healthcare assistants with adequate knowledge and practical skills in basic healthcare services.
2. Prepare students to assist in preventive, promotive, curative, and rehabilitative healthcare activities.
3. Provide understanding of human anatomy, physiology, nutrition, hygiene, and common diseases.
4. Train students in first aid, emergency care, patient handling, and basic nursing procedures.
5. Develop skills for maintaining sanitation, infection control, and patient safety in healthcare settings.
6. Enable students to assist healthcare professionals in hospitals, clinics, primary health centers, and community health programs.
7. Promote awareness regarding maternal and child health, immunization, family welfare, and national health programs.
8. Enhance communication, interpersonal, and counseling skills for effective interaction with patients and communities.
9. Develop ethical values, professional behavior, empathy, and social responsibility among students.
10. Train students in maintaining medical records, reporting systems, and healthcare documentation.

Element of the Descriptor	Program learning outcomes relating to Diploma Degree
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	Understand the basic concepts of human anatomy, physiology, microbiology, nutrition, and community health.
	Acquire knowledge of common diseases, their prevention, control, and basic management.
	Understand principles of hygiene, sanitation, infection control, and environmental health.
	Gain knowledge of first aid, emergency care, and patient support procedures.
	Understand national health programs, immunization schedules, and public health services.
General, technical and professional skills required to perform and accomplish tasks	Perform basic nursing care and assist in clinical and community healthcare activities.
	Demonstrate professional behavior, teamwork, leadership, and time management skills.
	Assist healthcare professionals during medical examinations, treatments, and emergencies.
	Apply infection control practices and maintain cleanliness and safety in healthcare settings.
	Communicate effectively with patients, families, and healthcare teams.
	Demonstrate skills in measuring vital signs, maintaining patient records, and reporting.
Application of knowledge and skills	Participate in community health programs, awareness campaigns, and preventive healthcare activities.
	Maintain proper documentation, reporting, and patient confidentiality in healthcare practice.
	Apply problem-solving and decision-making skills in healthcare and community settings.
	Apply theoretical knowledge in providing safe and effective patient care.
	Assist in implementing immunization, maternal, and child healthcare services.
Generic learning outcomes	Promote lifelong learning and adaptability to advancements in healthcare services.
	Develop leadership and teamwork qualities for collaborative healthcare delivery.

	Improve awareness of social, cultural, and environmental factors affecting health.
	Develop critical thinking and analytical abilities in healthcare practice.
Constitutional, humanistic, ethical, and moral values	Demonstrate compassion, empathy, and a caring attitude toward patients and communities.
	Encourage inclusive healthcare services without discrimination based on gender, caste, religion, or socioeconomic status.
	Uphold ethical principles and professional standards in healthcare practice.
	Practice honesty, integrity, and accountability in professional duties.
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	Develop practical skills required for employment in hospitals, clinics, primary health centers, and community healthcare organizations.
	Enhance professional communication and workplace behavior for healthcare environments.
	Develop organizational, managerial, and record-keeping skills for healthcare administration.
	Encourage entrepreneurial thinking for establishing community health services and wellness initiatives.
	Foster adaptability, professionalism, and continuous skill development to meet evolving healthcare industry demands.
Credit requirements	The DHA program shall be conducted under a credit-based academic system. Successful completion of internship/field training shall be essential for the completion of the program. Attendance requirements shall be fulfilled as per institutional and regulatory norms for appearing in examinations. Continuous internal assessment and end-semester examinations shall contribute to the total evaluation process.
Entry requirements	The candidate must have passed 10+2 or equivalent examination from a recognized board.
	Students from Science stream with Biology shall be preferred.
	The applicant should have obtained the minimum qualifying marks prescribed by the institution/university.

	Admission may be granted based on merit, entrance examination, or institutional admission policy.
	The candidate must submit all required academic and identification documents during admission.
	The minimum age for admission shall generally be 17 years at the time of admission.

SEMESTER: 1st									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Cred its			
DHA101	General Introductory Biology	Core Course	3	0	0	3	30	70	100
DHA102	Fundamental Chemistry	Core Course	3	1	0	4	30	70	100
DHA103	General Microbiology	Core Course	3	1	0	4	30	70	100
DHA104	Basic Elementary Physics	Core Course	3	1	0	4	30	70	100
DHA105	General Introductory Biology (Practical)	Practical Course	0	0	2	1	30	70	100
DHA106	Fundamental Chemistry (Practical)	Practical Course	0	0	4	2	30	70	100
DHA107	General Microbiology (Practical)	Practical Course	0	0	4	2	30	70	100
DHA108	Basic Elementary Physics (Practical)	Practical Course	0	0	4	2	30	70	100
TOTAL			12	3	14	22	240	560	800

SEMESTER: 2nd									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Credits			
DHA201	English Communication Skills	Core Course	3	1	0	4	30	70	100
DHA202	Anatomy and Physiology I	Core Course	3	1	0	4	30	70	100
DHA203	Basic Computers and Information Science	Core Course	3	1	0	4	30	70	100
DHA204	Fundamental of Nursing	Core Course	3	1	0	4	30	70	100
DHA205	Mathematics and Statistics	Core Course	4	0	0	4	30	70	100
DHA206	Basic Computers and Information Science (Practical)	Practical Course	0	0	4	2	30	70	100
DHA207	Anatomy and Physiology I (Practical)	Practical Course	0	0	4	2	30	70	100
TOTAL			12	4	8	24	210	490	700

SEMESTER: 3rd									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Credits			
DHA301	Anatomy and Physiology II	Core Course	3	1	0	4	30	70	100
DHA302	Pharmacology and Pharmacy I	Core Course	3	1	0	4	30	70	100
DHA303	Gynecology and Obstetrics	Core Course	3	1	0	4	30	70	100
DHA304	Zoology	Core Course	3	1	0	4	30	70	100
DHA305	Environmental Health	Core Course	4	0	0	4	30	70	100
DHA306	Anatomy and Physiology II (Practical)	Practical Course	0	0	4	2	30	70	100
DHA307	Zoology (Practical)	Practical Course	0	0	4	2	30	70	100
TOTAL			12	4	8	24	210	490	700

SEMESTER: 4th									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Credits			
DHA401	Epidemiology and Community Diagnosis	Core Course	3	1	0	4	30	70	100
DHA402	General Medicine I	Core Course	3	0	0	3	30	70	100
DHA403	General Surgery I	Core Course	2	1	0	3	30	70	100
DHA404	Pharmacology and Pharmacy II	Core Course	2	1	0	3	30	70	100
DHA405	Basics Medical Procedure and First Aid	Core Course	2	1	0	3	30	70	100
DHA406	General Medicine I (Practical)	Practical Course	0	0	4	2	30	70	100
DHA407	General Surgery I (Practical)	Practical Course	0	0	4	2	30	70	100
TOTAL			12	4	8	20	210	490	700

SEMESTER: 5th									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Credits			
DHA501	General Surgery II	Core Course	3	1	0	4	30	70	100
DHA502	General Medicine II	Core Course	3	1	0	4	30	70	100
DHA503	Clinical Pathology	Core Course	3	1	0	4	30	70	100
DHA504	Primary Health Care / Family Management	Core Course	3	1	0	4	30	70	100
DHA505	Health Education and Health Management	Core Course	4	0	0	4	30	70	100
DHA506	General Medicine II (Practical)	Practical Course	0	0	4	2	30	70	100
DHA507	General Surgery II (Practical)	Practical Course	0	0	4	2	30	70	100
TOTAL			16	4	8	24	210	490	700

SEMESTER: 6th									
Course Code	Course Title	Type of Course	Teaching Scheme				Int.	Ext.	Grand Total
			L	T	P	Credits			
DHA601	Internship	Clinical Training	0	0	0	20	60	140	200
TOTAL			0	0	0	20	60	140	200

1ST SEMESTER

Course Title: General Introductory Biology	L	T	P	Cr.
Course Code: DHA101	3	0	0	3

Total Hours 45 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the fundamental concepts, scope, and significance of biology and its applications in Medical Laboratory Sciences.
2. Describe the structure and functions of various tissues and cells in living organisms.
3. Differentiate between prokaryotic and eukaryotic cells and explain the organization of cellular components.
4. Illustrate the structure and functions of cell organelles and biomolecules involved in cellular activities.
5. Explain the mechanisms of cell division, including mitosis, meiosis, and binary fission.
6. Interpret the principles of heredity, inheritance patterns, and chromosomal behavior.
7. Describe the structure, replication, and functions of nucleic acids and their role in protein synthesis.
8. Apply basic biological concepts to understand human health, disease processes, and laboratory sciences.

COURSE CONTENTS**UNIT-I****13 Hours**

- Introduction to Biology: Definition, scope, and significance.
- Major branches of Biology and their applications.
- Scientific methods and approaches in biological investigations.
- Career opportunities in Medical Laboratory Sciences and allied health professions.
- Organization of living organisms.
- Structure and functions of animal tissues:
 - Epithelial tissue
 - Connective tissue
 - Muscular tissue
 - Nervous tissue

UNIT-II**15 Hours**

- Cell as the basic unit of life.
- Discovery of the cell and Cell Theory.
- Characteristics of cells as self-contained biological units.
- Prokaryotic and eukaryotic cells: structure and differences.
- Unicellular and multicellular organisms.
- Ultrastructure of prokaryotic and eukaryotic cells.
- Cell wall and plasma membrane.
- Fluid Mosaic Model of membrane structure.
- Membrane transport mechanisms:
 - Diffusion
 - Osmosis
 - Active transport
- Cellular movements:
 - Endocytosis
 - Exocytosis

UNIT-III

17 Hours

Cell Organelles and Their Functions

- Nucleus
- Mitochondria
- Plastids
- Endoplasmic Reticulum
- Golgi Apparatus
- Lysosomes
- Ribosomes
- Vacuoles
- Centrioles
- Cytoskeleton
- Microtubules
- Cilia and Flagella

Biomolecules of the Cell

- Inorganic molecules:
 - Water
 - Salts
 - Mineral ions
- Organic molecules:
 - Carbohydrates
 - Lipids

- Amino acids
- Proteins
- Nucleotides
- Nucleic acids (DNA and RNA)

Cell Division

- Binary fission
- Cell cycle and its phases
- Mitosis: stages and significance
- Meiosis: stages and significance

UNIT-IV

15 Hours

Principles of Heredity

- Heredity and variation
- Mendel's laws of inheritance
- Chromosomal basis of inheritance

Patterns of Inheritance

- Incomplete dominance
- Multiple alleles
- Quantitative inheritance

Chromosomes and Genes

- Chromosomes in bacterial and eukaryotic cells
- Relationship between genes and chromosomes
- Genome organization
- Linkage and crossing over
- Recombination and gene mapping

Molecular Genetics

- DNA as genetic material
- Structure and replication of DNA
- Structure of RNA
- Role of RNA in protein synthesis
- Central dogma of molecular biology

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Reece, J.B., Urry, L.A., Cain, M.L., Minorsky, P.V., & Jackson, R.B. Campbell Biology. Pearson Education.*
- *Fried, G.H., & Hademenos, G.J. Schaum's Outline of Biology. McGraw-Hill Education.*
- *Verma, P.S., & Agarwal, V.K. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand Publications.*
- *Rastogi, S.C. Cell Biology. New Age International Publishers.*
- *Lodish, H. et al. Molecular Cell Biology. W.H. Freeman.*

Course Title: Fundamental Chemistry	L	T	P	Cr.
Course Code: DHA102	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the structure, classification, and properties of solids, including crystal lattices, unit cells, defects, and semiconductors.
2. Apply the principles of solutions and colligative properties to determine concentration, molecular mass, and solution behavior.
3. Analyze electrochemical processes, electrolysis, galvanic cells, corrosion, and their applications in chemical systems.
4. Interpret reaction kinetics, rate laws, activation energy, and factors influencing the rate of chemical reactions.
5. Describe the principles of surface chemistry, colloidal systems, catalysis, and metallurgical processes involved in the extraction and purification of metals.

COURSE CONTENTS**UNIT-I****16 Hours**

- Classification of solids based on intermolecular forces:
 - Molecular solids
 - Ionic solids
 - Covalent solids
 - Metallic solids
- Amorphous and crystalline solids: characteristics and differences.
- Crystal lattice and unit cells.
- Two-dimensional and three-dimensional lattice structures.
- Calculation of density of unit cells.
- Packing in solids and packing efficiency.
- Voids in crystal structures.
- Number of atoms per unit cell in cubic crystals.
- Crystal defects:
 - Point defects
 - Stoichiometric and non-stoichiometric defects
- Electrical and magnetic properties of solids.
- Band theory of metals.
- Conductors, semiconductors, and insulators.
- Intrinsic and extrinsic semiconductors.
- n-type and p-type semiconductors.

UNIT-II**15 Hours****Solutions**

- Introduction and classification of solutions.
- Types of solutions.
- Methods of expressing concentration:
 - Molarity
 - Molality
 - Mole fraction
 - Percentage composition
- Solubility of gases in liquids.
- Solid solutions.
- Colligative properties:
 - Relative lowering of vapour pressure
 - Raoult's Law
 - Elevation of boiling point
 - Depression of freezing point
 - Osmotic pressure
- Determination of molecular mass using colligative properties.
- Abnormal molecular mass.
- Van't Hoff factor.

Electrochemistry

- Oxidation and reduction reactions.
- Conductance in electrolytic solutions.
- Specific conductivity and molar conductivity.
- Variation of conductivity with concentration.

UNIT-III**14 Hours****Electrochemical Cells**

- Kohlrausch's Law and its applications.
- Electrolysis and Faraday's laws of electrolysis (elementary concepts).
- Dry cells and electrolytic cells.
- Galvanic cells and their working principles.
- Lead-acid accumulator.
- Electromotive force (EMF) of a cell.
- Standard electrode potential.

- Nernst equation and its applications.
- Relationship between Gibbs free energy and EMF.
- Fuel cells and their significance.
- Corrosion and methods of prevention.

Chemical Kinetics

- Rate of chemical reactions:
 - Average rate
 - Instantaneous rate
- Factors affecting reaction rates:
 - Concentration
 - Temperature
 - Catalyst
 - Surface area
- Order and molecularity of reactions.
- Rate law and rate constant.
- Integrated rate equations for:
 - Zero-order reactions
 - First-order reactions
- Half-life of reactions.
- Collision theory (elementary concept).
- Activation energy.
- Arrhenius equation.

UNIT-IV

15 Hours

Surface Chemistry

- Adsorption and its characteristics.
- Types of adsorptions:
 - Physisorption
 - Chemisorption
- Factors affecting adsorption of gases on solids.
- Catalysis:
 - Homogeneous catalysis
 - Heterogeneous catalysis
- Colloidal systems:
 - Colloids and suspensions
 - Lyophilic and lyophobic colloids
 - Multimolecular colloids
 - Macromolecular colloids

- Properties of colloids:
 - Tyndall effect
 - Brownian movement
 - Electrophoresis
 - Coagulation
- Emulsions and their types.

General Principles and Processes of Isolation of Elements

- Occurrence of metals in nature.
- Principles of extraction and metallurgy.
- Methods of extraction:
 - Concentration of ores
 - Oxidation
 - Reduction
 - Electrolytic methods
 - Refining processes
- Extraction and purification of:
 - Aluminium
 - Copper
 - Zinc
 - Iron

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Puri BR, Sharma LR, Pathania MS. Principles of Physical Chemistry. 48th ed. New Delhi: Vishal Publishing Co.; 2022.
- Atkins P, de Paula J, Keeler J. Atkins' Physical Chemistry. 12th ed. Oxford: Oxford University Press; 2023.
- Lee JD. Concise Inorganic Chemistry. 5th ed. New Delhi: Wiley India Pvt Ltd; 2018.
- Brown TL, LeMay HE, Bursten BE, Murphy CJ, Woodward PM, Stoltzfus MW. Chemistry: The Central Science. 15th ed. New York: Pearson Education; 2020.

- Oxtoby DW, Gillis HP, Campion A. Principles of Modern Chemistry. 8th ed. Boston: Cengage Learning; 2019.

Course Title: General Microbiology	L	T	P	Cr.
Course Code: DHA103	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the basic concepts, history, scope, and significance of microbiology in healthcare and laboratory sciences.
2. Describe the morphology, structure, classification, and growth characteristics of bacteria.
3. Demonstrate knowledge of microscopy principles and the proper handling and maintenance of microscopes.
4. Explain the principles and applications of sterilization, disinfection, and antisepsis in laboratory practice.
5. Differentiate between various sterilization methods and evaluate their effectiveness.
6. Describe the preparation, inoculation, and cultivation of microorganisms under aerobic and anaerobic conditions.
7. Perform and interpret common microbiological staining techniques used for bacterial identification.
8. Apply microbiological principles to infection control and diagnostic laboratory procedures.

COURSE CONTENTS**UNIT-I****13 Hours**

- Definition and scope of Microbiology.
- Historical development of Microbiology.
- Contributions of pioneering microbiologists.
- Importance of microbiology in medicine, healthcare, and laboratory sciences.
- Classification of microorganisms.
- General characteristics of microorganisms.
- Introduction to bacterial morphology.
- Structure and organization of bacterial cells.
- Significance of bacteria in health and disease.

UNIT-II**15 Hours****Bacterial Morphology and Physiology**

- Types of bacteria.
- Classification of bacteria based on shape and arrangement:

- Cocci
- Bacilli
- Vibrios
- Spirilla
- Spirochetes
- Detailed structure of bacterial cells:
 - Cell wall
 - Plasma membrane
 - Cytoplasm
 - Nucleoid
 - Ribosomes
- Specialized bacterial structures:
 - Capsules
 - Flagella
 - Pili/Fimbriae
 - Endospores
- Growth and multiplication of bacteria.
- Nutritional requirements of bacteria.
- Bacterial growth curve.

Microscopy

- Principles of microscopy.
- Types of microscopes.
- Structure and working of:
 - Simple microscope
 - Compound microscope
- Care, maintenance, and handling of microscopes.
- Applications of microscopy in microbiology.

UNIT-III

17 Hours

Sterilization

- Definition, objectives, and importance of sterilization.
- Methods of sterilization:
 - Dry heat sterilization
 - Moist heat sterilization
 - Radiation sterilization
 - Filtration sterilization

Sterilization Equipment

- Hot air oven:
 - Structure
 - Principle
 - Operation
 - Sterilization indicators
- Autoclave:
 - Structure
 - Principle
 - Functioning
 - Controls and monitoring
 - Sterilization indicators

Disinfection and Antisepsis

- Definitions of antiseptics and disinfectants.
- Characteristics of an ideal disinfectant.
- Types and classification of disinfectants.
- Factors influencing the action of disinfectants.
- Uses and applications of disinfectants and antiseptics in healthcare settings.

UNIT-IV

15 Hours

Bacterial Culture Techniques

- Introduction to culture media.
- Types of culture media and their applications.
- Preparation and inoculation of culture media.
- Aerobic and anaerobic culture methods.
- Isolation of microorganisms.
- Pure culture and mixed culture techniques.
- Maintenance and preservation of cultures.

Staining Techniques

- Principles and importance of staining.
- Preparation of bacterial smears.
- Simple and differential staining methods.
- Gram staining:
 - Principle
 - Procedure
 - Interpretation
- Ziehl-Neelsen (Z-N) staining:

- Principle
- Procedure
- Applications
- Albert's staining:
 - Principle
 - Procedure
 - Applications

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Ananthanarayan and Paniker's Textbook of Microbiology. Universities Press.*
- *Prescott's Microbiology. McGraw-Hill Education.*
- *Microbiology. Tata McGraw-Hill.*
- *Textbook of Microbiology. S. Chand Publishing.*
- *Medical Microbiology. Elsevier.*
- *District Laboratory Practice in Tropical Countries. Cambridge University Press.*
- *Microbiology: A Laboratory Manual. Pearson Education.*
- *Jawetz, Melnick and Adelberg's Medical Microbiology. McGraw-Hill Education.*

Course Title: Basic Elementary Physics	L	T	P	Cr.
Course Code: DHA104	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the importance of measurements, systems of units, and SI units used in scientific and healthcare applications.
2. Apply the concepts of fundamental and derived units in solving basic physical problems.
3. Describe the principles of magnetism and electromagnetic effects associated with electric currents.
4. Explain the structure of atoms and nuclei, radioactivity, and their applications in science and medicine.
5. Differentiate among alpha, beta, and gamma radiations and interpret the principles of radioactive decay.
6. Describe the laws of reflection and refraction and their applications in optical instruments.
7. Explain image formation by mirrors and lenses and calculate magnification and lens power.
8. Relate the principles of optics, microscopy, and radiation physics to healthcare and laboratory sciences.

COURSE CONTENTS**UNIT-I****14 Hours**

- Introduction to Physics and its relevance in healthcare sciences.
- Need and importance of measurements in science.
- Physical quantities and measurement standards.
- Systems of units:
 - CGS system
 - FPS system
 - MKS system
 - SI system
- International System of Units (SI Units).
- Fundamental quantities and fundamental units.
- Derived quantities and derived units.
- Measurement of length, mass, and time.
- Precision, accuracy, and errors in measurement.
- Applications of SI units in medical and laboratory sciences.

UNIT-II**16 Hours**

- Introduction to magnetism.
- Magnetic field and magnetic field lines.
- Properties of magnets.
- Magnetic effects of electric current.
- Oersted's experiment and its significance.
- Biot-Savart Law:
 - Statement
 - Applications to current-carrying circular loops
- Ampere's Circuital Law:
 - Statement and significance
 - Applications to:
 - Infinitely long straight conductors
 - Solenoids
 - Toroidal solenoids
- Electromagnets and their applications.
- Magnetic field measurement and practical uses in healthcare technology.

UNIT-III**15 Hours****Atomic Structure**

- Historical development of atomic models.
- Alpha-particle scattering experiment.
- Rutherford's atomic model.
- Bohr's atomic model.
- Energy levels and electronic transitions.
- Hydrogen spectrum and its significance.

Nuclear Physics

- Composition and structure of the nucleus.
- Nuclear size and atomic mass.
- Isotopes, isobars, and isotones.
- Nuclear stability.

Radioactivity

- Discovery and nature of radioactivity.
- Types of radioactive emissions:
 - Alpha particles

- Beta particles
- Gamma rays
- Properties and characteristics of radioactive radiations.
- Radioactive decay law.
- Half-life and mean life concepts.
- Applications of radioactivity in medicine, industry, agriculture, and research.

UNIT-IV

15 Hours

Reflection of Light

- Nature and properties of light.
- Laws of reflection.
- Spherical mirrors:
 - Concave mirror
 - Convex mirror
- Formation of images by mirrors.
- Magnification produced by mirrors.

Refraction of Light

- Laws of refraction.
- Refractive index and its significance.
- Lenses and their types:
 - Convex lens
 - Concave lens
- Image formation by lenses.
- Magnification and power of lenses.

Dispersion and Scattering of Light

- Refraction through a prism.
- Dispersion of white light.
- Scattering of light.
- Blue colour of the sky.
- Reddish appearance of the sun at sunrise and sunset.

Optical Instruments

- Principles and applications of microscopes.
- Simple microscope.
- Compound microscope.
- Magnifying power of microscopes.

- Introduction to photochromic and optical devices used in healthcare.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Concepts of Physics. Bharati Bhawan Publishers.*
- *Fundamentals of Physics. Wiley India.*
- *University Physics. Pearson Education.*
- *College Physics. Cengage Learning.*
- *Physics for the Health Sciences. McGraw-Hill Education.*
- *Modern Physics. S. Chand Publishing.*
- *A Textbook of Optics. S. Chand Publishing.*
- *Engineering Physics. Dhanpat Rai Publications.*

Course Title: General Introductory Biology (Practical)	L	T	P	Cr.
Course Code: DHA105	0	0	2	1

Total Hours 30 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate basic laboratory skills and safety practices in biological experiments.
2. Identify different stages of mitosis and meiosis using prepared microscopic slides.
3. Explain the significance of cell division in growth, reproduction, and heredity.
4. Perform experiments demonstrating the processes of diffusion and osmosis.
5. Interpret the movement of substances across biological membranes.
6. Identify and differentiate various animal tissues under a microscope.
7. Recognize the structural characteristics of epithelial, muscular, nervous, and blood tissues.
8. Record observations, analyze results, and prepare practical reports using scientific methods.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

30 hours

Practical 1: Laboratory Safety and Microscopy

- Introduction to biology laboratory practices.
- Laboratory safety rules and precautions.
- Identification and handling of biological specimens and slides.
- Basic operation and care of the compound microscope.

Practical 2: Study of Mitosis

- Observation of mitotic stages using permanent slides.
- Identification of:
 - Prophase
 - Metaphase
 - Anaphase
 - Telophase
- Significance of mitosis in cell growth and repair.

Practical 3: Study of Meiosis

- Observation of meiotic stages using prepared slides of animal cells (Grasshopper testis).
- Identification of meiotic divisions and their significance in reproduction.

Practical 4: Demonstration of Diffusion

- Experimental study of diffusion in liquids.
- Factors affecting diffusion.
- Observation and interpretation of results.

Practical 5: Demonstration of Osmosis

- Study of osmosis using suitable biological or artificial membranes.
- Hypertonic, hypotonic, and isotonic solutions.
- Significance of osmosis in living organisms.

Practical 6: Study of Epithelial Tissue

- Microscopic examination of epithelial tissue.
- Identification of major structural features and functions.

Practical 7: Study of Muscular Tissue

- Observation and identification of skeletal, smooth, and cardiac muscle tissues.
- Correlation of structure with function.

Practical 8: Study of Nervous Tissue

- Microscopic examination of neurons and supporting cells.
- Identification of major components of nervous tissue.

Practical 9: Study of Mammalian Blood Cells

- Observation of blood smear slides.
- Identification of:
 - Red Blood Cells (RBCs)
 - White Blood Cells (WBCs)
 - Platelets
- Basic morphology and functions of blood cells.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Campbell Biology*. Pearson Education.
- *Practical Biology*. CBS Publishers.
- *Biology Practical Manual*. Rastogi Publications.
- *Essential Cell Biology*. Garland Science.
- *Human Histology*. Jaypee Brothers Medical Publishers.
- *Textbook of Histology*. Current Books International.
- *Laboratory Manual in Biology*. McGraw-Hill Education.
- *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology*. S. Chand Publishing.

Course Title: Fundamental Chemistry (Practical)	L	T	P	Cr.
Course Code: DHA106	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate safe laboratory practices and proper handling of chemical reagents and laboratory equipment.
2. Perform cleaning, maintenance, and preparation of laboratory glassware according to standard procedures.
3. Prepare distilled water and understand its importance in laboratory analysis.
4. Operate, calibrate, and maintain a pH meter for accurate pH measurement.
5. Prepare standard solutions of acids, bases, and salts with the desired normality and molarity.
6. Apply the concepts of normality, molarity, and solution preparation in laboratory work.
7. Perform basic calculations related to the preparation of chemical solutions.
8. Maintain laboratory records and interpret experimental observations accurately.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Laboratory Safety and Good Laboratory Practices

- Introduction to chemistry laboratory rules and regulations.
- Personal protective equipment (PPE).
- Safe handling, storage, and disposal of chemicals.
- Laboratory hazards and safety precautions.

Practical 2: Cleaning and Maintenance of Laboratory Glassware

- Identification of common laboratory glassware.
- Procedures for cleaning laboratory apparatus.
- Drying, storage, and maintenance of glassware.
- Prevention of contamination during laboratory work.

Practical 3: Preparation of Distilled Water

- Principle of distillation.
- Components and operation of a distillation unit.

- Collection and storage of distilled water.
- Applications of distilled water in laboratory procedures.

Practical 4: pH Meter

- Principle and working of a pH meter.
- Components and functions of a pH meter.
- Calibration using standard buffer solutions.
- Measurement of pH of different solutions.
- Care and maintenance of the instrument.

Practical 5: Preparation of Standard Sodium Hydroxide Solution

- Preparation of 0.1 N Sodium Hydroxide (NaOH) solution.
- Calculations for normality.
- Proper weighing and dilution techniques.

Practical 6: Preparation of Standard Hydrochloric Acid Solution

- Preparation of 0.2 N Hydrochloric Acid (HCl) solution.
- Safety precautions while handling acids.
- Calculation and dilution procedures.

Practical 7: Preparation of Sulphuric Acid Solution

- Preparation of 0.1 M Sulphuric Acid (H_2SO_4) solution.
- Principles of molarity.
- Safe handling and dilution of concentrated acids.

Practical 8: Preparation of Sodium Carbonate Solution

- Preparation of 0.2 M Sodium Carbonate (Na_2CO_3) solution.
- Weighing and solution preparation techniques.
- Applications of standard solutions in analytical chemistry.

Practical 9: Basic Calculations in Solution Preparation

- Calculation of molarity, normality, and percentage solutions.
- Preparation of solutions of different concentrations.
- Record keeping and result documentation.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Vogel's Textbook of Quantitative Chemical Analysis. Pearson Education.*
- *Practical Chemistry. CBS Publishers.*
- *Laboratory Manual in Chemistry. New Age International Publishers.*
- *Experimental Chemistry. Universities Press.*
- *Textbook of Practical Chemistry. Sultan Chand & Sons.*
- *Fundamentals of Analytical Chemistry. Cengage Learning.*
- *College Practical Chemistry. Universities Press.*
- *Practical Manual of Chemistry. S. Chand Publishing.*

Course Title: General Microbiology (Practical)	L	T	P	Cr.
Course Code: DHA107	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate safe laboratory practices and universal precautions in a microbiology laboratory.
2. Perform proper cleaning, disinfection, and sterilization of laboratory equipment and materials.
3. Operate and maintain common microbiological instruments, including the compound microscope and autoclave.
4. Prepare, sterilize, and utilize various culture media for microbial growth.
5. Perform microbiological staining techniques and interpret microscopic findings.
6. Demonstrate bacterial motility and understand its significance in microbial identification.
7. Carry out aerobic and anaerobic culture techniques for the cultivation of microorganisms.
8. Perform antimicrobial susceptibility testing and interpret the results for clinical applications.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Laboratory Safety and Universal Precautions

- Introduction to microbiology laboratory safety.
- Universal precautions and biosafety measures.
- Use of personal protective equipment (PPE).
- Handling and disposal of biological waste.
- Prevention of laboratory-acquired infections.

Practical 2: Cleaning and Disinfection of Laboratory Ware

- Preparation of cleaning agents and disinfectant solutions.
- Cleaning procedures for glassware and plasticware.
- Decontamination and maintenance of laboratory equipment.
- Prevention of contamination during laboratory procedures.

Practical 3: Sterilization Techniques

- Sterilization by moist heat using an autoclave.

- Sterilization by dry heat using a hot air oven.
- Operating procedures, controls, and indicators of sterilization.
- Quality assurance in sterilization processes.

Practical 4: Handling and Use of Compound Microscope

- Identification of microscope components.
- Focusing techniques and illumination adjustment.
- Examination of stained specimens.
- Care, cleaning, and maintenance of the microscope.

Practical 5: Microbiological Staining Techniques

- Preparation of bacterial smears.
- Gram staining:
 - Principle
 - Procedure
 - Interpretation
- Albert's staining:
 - Principle
 - Procedure
 - Interpretation
- Ziehl-Neelsen (Z-N) staining:
 - Principle
 - Procedure
 - Interpretation

Practical 6: Demonstration of Bacterial Motility

- Hanging drop method:
 - Principle
 - Procedure
 - Observation and interpretation
- Significance of motility testing in bacterial identification.

Practical 7: Preparation and Sterilization of Culture Media

- Principles of culture media preparation.
- Preparation and sterilization of:
 - Nutrient Agar
 - Nutrient Broth
 - Blood Agar
 - Chocolate Agar
 - MacConkey Agar
 - Lowenstein-Jensen (LJ) Medium

- Storage and quality control of culture media.

Practical 8: Aerobic and Anaerobic Culture Techniques

- Inoculation methods for bacterial culture.
- Aerobic culture techniques.
- Anaerobic culture methods and anaerobic systems.
- Isolation and observation of microbial growth.

Practical 9: Antimicrobial Susceptibility Testing

- Principles of antimicrobial sensitivity testing.
- Stokes Disc Diffusion Method:
 - Procedure
 - Interpretation of results
- Clinical significance of antimicrobial susceptibility testing.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Ananthanarayan and Paniker's Textbook of Microbiology. Universities Press.*
- *Mackie and McCartney Practical Medical Microbiology. Churchill Livingstone.*
- *District Laboratory Practice in Tropical Countries. Cambridge University Press.*
- *Microbiology: A Laboratory Manual. Pearson Education.*
- *Practical Medical Microbiology. Churchill Livingstone.*
- *Textbook of Diagnostic Microbiology. Elsevier.*
- *Bailey and Scott's Diagnostic Microbiology. Elsevier.*
- *Laboratory Exercises in Microbiology. McGraw-Hill Education.*

Course Title: Basic Elementary Physics (Practical)	L	T	P	Cr.
Course Code: DHA108	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate the fundamental principles of physics through laboratory experiments.
2. Perform measurements using basic laboratory instruments and analyze experimental data.
3. Explain the properties and behavior of sound and heat through practical demonstrations.
4. Construct and analyze simple DC and AC electrical circuits.
5. Measure electrical parameters such as voltage, current, and resistance using appropriate instruments.
6. Demonstrate the principles of magnetic circuits and magnetic fields.
7. Explain the process of rectification and its applications in electronic devices.
8. Maintain laboratory records, interpret experimental results, and follow laboratory safety practices.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Introduction to Physics Laboratory

- Laboratory safety rules and precautions.
- Familiarization with basic physics laboratory instruments.
- Measurement of length, mass, time, and volume using standard instruments.
- Recording and analysis of experimental observations.

Practical 2: Experiments on Sound

- Study of sound waves and their properties.
- Determination of frequency using tuning forks.
- Demonstration of resonance and vibration.
- Measurement of wavelength and velocity of sound (demonstration).

Practical 3: Experiments on Heat

- Measurement of temperature using thermometers.
- Study of heat transfer by conduction, convection, and radiation.
- Determination of specific heat capacity (demonstration).

- Observation of thermal expansion in solids and liquids.

Practical 4: Fundamentals of DC Circuits

- Identification and use of electrical components.
- Verification of Ohm's Law.
- Measurement of current, voltage, and resistance.
- Series and parallel resistor circuits.
- Use of ammeter, voltmeter, and multimeter.

Practical 5: AC Circuits

- Introduction to alternating current.
- Observation of AC waveform characteristics.
- Study of resistance, capacitance, and inductance in AC circuits.
- Measurement of voltage and current in simple AC circuits.

Practical 6: Magnetic Circuits

- Study of magnetic fields using bar magnets and electromagnets.
- Mapping of magnetic field lines.
- Demonstration of magnetic effects of electric current.
- Construction and testing of a simple electromagnet.

Practical 7: Rectification

- Introduction to semiconductor diodes.
- Study of half-wave rectifier circuit.
- Study of full-wave rectifier circuit.
- Observation of AC to DC conversion.
- Applications of rectifiers in electronic equipment.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Concepts of Physics. Bharati Bhawan Publishers.*
- *Fundamentals of Physics. Wiley India.*
- *Practical Physics. Pragati Prakashan.*

- *Advanced Practical Physics for Students. Asia Publishing House.*
- *University Practical Physics. S. Chand Publishing.*
- *Engineering Physics Laboratory Manual. Dhanpat Rai Publications.*
- *Basic Electronics. S. Chand Publishing.*
- *Physics Laboratory Manual. Anmol Publications.*

2ND SEMESTER

Course Title: English Communication Skills	L	T	P	Cr.
Course Code: DHA201	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate proficiency in English grammar, vocabulary, and writing skills for academic and professional communication.
2. Apply effective reading and writing techniques, including comprehension, summarization, creative writing, and formal correspondence.
3. Develop verbal communication skills through speech preparation, presentations, interviews, and professional interactions.
4. Utilize effective listening skills and overcome communication barriers in personal, academic, and healthcare settings.
5. Employ verbal and non-verbal communication strategies to establish rapport and communicate effectively with patients, attendants, and healthcare professionals.

COURSE CONTENTS

UNIT-I

13 Hours

Language and Grammar Fundamentals

- Vocabulary development and word enrichment
- Synonyms, antonyms, homonyms, and analogies
- Prefixes, suffixes, and portmanteau words
- One-word substitutions and euphemisms

Grammar Essentials

- Active and passive voice
- Direct and indirect speech
- Prepositions and conjunctions
- Common grammatical errors and their correction

Written Communication Skills

- Letter writing and professional correspondence
- E-mail writing and digital communication etiquette

- Essay and article writing
- Memo writing and note-making techniques
- Reading comprehension and interpretation

UNIT-II

16 Hours

Reading and Writing Skills

- Reading techniques and comprehension strategies
- Summary writing and précis preparation
- Creative writing exercises
- Newspaper reading and analysis
- Practical writing exercises

Spoken Language Skills

- Formal speech and public communication
- Basics of phonetics and pronunciation
- Semantics and effective language usage

Communication in Healthcare Settings

- Introduction to communication
- Communication process and its components
- Elements and types of communication
- Barriers to effective communication and strategies to overcome them
- Communication with patients and attendants in healthcare environments
- Professional communication ethics in hospitals

UNIT-III

16 Hours

Speaking Skills

- Importance of effective speaking
- Voice culture and voice modulation
- Preparation and organization of speeches
- Principles of effective speech delivery
- Audience analysis and audience psychology
- Presentation skills and public speaking techniques
- Individual presentations and feedback sessions
- Conference participation and interview techniques

Listening Skills

- Importance of active listening
- Self-assessment of listening abilities
- Developing effective listening habits
- Barriers to listening and methods to overcome them
- Persuasive and empathetic listening
- Action planning for communication improvement

UNIT-IV

15 Hours

Reading Skills Enhancement

- Principles of efficient and rapid reading
- Assessment of personal reading habits
- Techniques for improving reading speed
- Methods to enhance concentration and comprehension
- Systematic study techniques for academic success

Non-Verbal Communication

- Introduction to non-verbal communication
- Types and significance of body language
- Facial expressions, gestures, posture, and eye contact
- Building interpersonal rapport
- Introduction to Neuro-Linguistic Programming (NLP)
- Application of non-verbal communication skills in healthcare settings

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Wren, P.C. & Martin, H. – *High School English Grammar and Composition*.
- Raman, Meenakshi & Sharma, Sangeeta – *Technical Communication: Principles and Practice*.
- Rizvi, M. Ashraf – *Effective Technical Communication*.

- *Murphy, Raymond – Essential English Grammar.*
- *Bhatnagar, Nitin & Mamta Bhatnagar – Communicative English for Professionals.*
- *Pease, Allan & Barbara Pease – The Definitive Book of Body Language.*
- *Carnegie, Dale – The Quick and Easy Way to Effective Speaking.*
- *Mohan, Krishna & Banerji, Meera – Developing Communication Skills.*
- *Oxford Advanced Learner's Dictionary (Latest Edition).*
- *Kumar, Sanjay & Pushp Lata – Communication Skills.*

Course Title: Anatomy and Physiology I	L	T	P	Cr.
Course Code: DHA202	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Describe the structural organization of the human body from the cellular level to organ systems using appropriate anatomical terminology.
2. Explain the anatomy of major body systems including skeletal, muscular, nervous, cardiovascular, respiratory, digestive, urinary, endocrine, reproductive, and sensory systems.
3. Demonstrate understanding of the physiological functions of cells, tissues, blood, lymphatic system, muscles, and nervous system in maintaining homeostasis.
4. Interpret the physiological mechanisms involved in respiration, circulation, digestion, excretion, reproduction, and endocrine regulation.
5. Correlate anatomical structures with their physiological functions and apply this knowledge in healthcare and allied health sciences.

COURSE CONTENTS

UNIT-I

14 Hours

Introduction to Human Anatomy

- Anatomical terminology and anatomical position
- Anatomical planes, regions, and body cavities
- Levels of structural organization
- Overview of organ systems of the human body

Cellular Organization

- Structure and functions of the cell
- Cell membrane and cytoplasm
- Cell organelles and nucleus
- Cell extensions and cellular specialization

Tissue Organization

- Epithelial tissue: classification and functions
- Connective tissue: types and functions
- Muscular tissue: skeletal, cardiac, and smooth muscle
- Nervous tissue and its components

Blood and Lymphatic System

- Composition and functions of blood
- Structure and characteristics of erythrocytes, leukocytes, and platelets
- Lymphatic vessels and lymphatic circulation
- Lymphatic organs: spleen, thymus, and tonsils

Nervous and Muscular Systems

- Central and peripheral nervous systems
- Brain, cerebellum, spinal cord, and cranial nerves
- Autonomic nervous system
- Classification and anatomy of muscles of the body

UNIT-II

16 Hours

Skeletal and Musculoskeletal Systems

- Structure and classification of bones
- Axial and appendicular skeleton
- Joints of the upper and lower limbs
- Functional anatomy of the musculoskeletal system

Respiratory and Cardiovascular Systems

- Anatomy of the nose and paranasal sinuses
- Pharynx, larynx, trachea, bronchi, and lungs
- Structure of the heart and major blood vessels

Digestive System

- Oral cavity and salivary glands
- Pharynx and esophagus
- Stomach and intestines
- Liver, gallbladder, and pancreas

Urinary and Reproductive Systems

- Kidneys and juxtaglomerular apparatus
- Ureters, urinary bladder, and urethra
- Female reproductive organs and mammary glands
- Male reproductive organs including testes, scrotum, penis, and prostate gland

Endocrine System, Genetics, and Special Senses

- Hormones and endocrine glands
- Pituitary, thyroid, parathyroid, adrenal glands, and endocrine pancreas
- Basic concepts of chromosomes and DNA
- Anatomy of olfactory organs, tongue, ear, and eye
- Structure of skin and its appendages

UNIT-III

15 Hours

Introduction to Human Physiology

- Composition of the human body
- Homeostasis and its significance
- Basic chemistry of life

Cellular and Tissue Physiology

- Functions of carbohydrates, proteins, and lipids
- Physiological role of cell organelles
- Functions of epithelial, connective, muscular, and nervous tissues

Blood, Immunity, and Lymphatic Physiology

- Haemopoiesis and blood cell formation
- Haemostasis and blood coagulation
- Blood transfusion and blood groups
- Functions of lymphatic organs and tissues
- Innate and acquired immunity
- Humoral and cell-mediated immune responses

Nervous and Muscular Physiology

- Properties of nerve fibers
- Neuroglia and synaptic transmission
- Functions of the brain, cranial nerves, and cerebrospinal fluid
- Reflex actions and reflex arc
- Physiology of skeletal, cardiac, and smooth muscles

Skeletal and Respiratory Physiology

- Functions of bones and skeleton
- Movements at joints
- Mechanism of respiration
- Pulmonary function tests
- Gas exchange and transport

- Regulation of respiration

UNIT-IV

15 Hours

Cardiovascular Physiology

- Cardiac cycle and cardiac output
- Systemic and pulmonary circulation
- Electrocardiography (ECG)
- Regulation of blood pressure

Digestive Physiology

- Mechanism of digestion and absorption
- Functions of digestive organs
- Role of liver, gallbladder, and pancreas in digestion

Urinary Physiology

- Functions of the kidneys and urinary tract
- Formation and composition of urine
- Glomerular filtration and tubular reabsorption
- Water and electrolyte balance
- Physiology of micturition

Genetics and Reproductive Physiology

- DNA structure and protein synthesis
- Principles of inheritance
- Dominant, recessive, and sex-linked inheritance
- Physiology of male and female reproductive systems

Endocrine Physiology, Special Senses, and Skin

- Mechanism of hormone action
- Functions of major endocrine glands
- Physiology of smell, taste, hearing, equilibrium, and vision
- Functions of skin and skin appendages
- Temperature regulation and maintenance of body homeostasis

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Ross and Wilson – Anatomy and Physiology in Health and Illness.*
- *Gerard J. Tortora & Bryan Derrickson – Principles of Anatomy and Physiology.*
- *Guyton & Hall – Textbook of Medical Physiology.*
- *A.K. Jain – Textbook of Physiology (Vol. I & II).*
- *Indu Khurana – Textbook of Human Anatomy and Physiology.*
- *B.D. Chaurasia – Human Anatomy (Volumes I, II & III).*
- *Vishram Singh – Textbook of Anatomy (Volumes I, II & III).*
- *Sembulingam & Sembulingam – Essentials of Medical Physiology.*
- *K. Sathyanarayana – Human Anatomy and Physiology.*
- *C.C. Chatterjee – Human Physiology.*

Course Title: Basic Computers and Information Science	L	T	P	Cr.
Course Code: DHA203	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the fundamental concepts, components, and generations of computers and their applications in healthcare settings.
2. Identify and operate various input, output, storage, and memory devices used in computer systems.
3. Demonstrate proficiency in using Microsoft Office applications for document preparation, data management, analysis, and presentations.
4. Describe the concepts of operating systems, computer networks, and internet technologies and their practical applications.
5. Utilize computer and information technology tools effectively for communication, information management, and clinical healthcare services.

COURSE CONTENTS

UNIT-I

14 Hours

Introduction to Computers

- Definition and characteristics of computers
- Evolution and generations of computers
- Functional components and block diagram of a computer
- Classification of computers
- Computer programming languages: Machine, Assembly, and High-Level Languages

Input and Output Devices

- Concepts and functions of input and output devices
- Input devices:
 - Keyboard and mouse
 - Pointing and drawing devices
 - Data scanning devices
 - Digitizers
 - Electronic card readers
 - Voice recognition systems
 - Vision-based input devices
- Output devices:

- Monitors and display units
- Printers and plotters
- Screen image projectors
- Voice response systems

UNIT-II

15 Hours

Processor and Memory

- Central Processing Unit (CPU): structure and functions
- Arithmetic Logic Unit (ALU) and Control Unit (CU)
- Main memory: RAM, ROM, and cache memory
- Memory hierarchy

Storage Devices

- Sequential and direct-access storage devices
- Magnetic tape storage
- Magnetic disk storage
- Optical storage devices
- Mass storage systems and modern storage technologies

Introduction to Windows Operating System

- History and evolution of Windows
- Features and functions of Windows
- Desktop environment and taskbar
- Icons and shortcuts
- File and folder management
- Creating and managing folders
- Window operations: opening, closing, moving, resizing, minimizing, and maximizing applications

UNIT-III

16 Hours

Microsoft Word

- Introduction to word processing
- Components of the MS Word interface
- Creating, opening, and saving documents
- Editing and formatting text
- Page setup and document layout

- Spell checking and grammar tools
- Printing documents
- Creating and formatting tables
- Mail merge and document automation

Microsoft Excel

- Introduction to spreadsheets
- Understanding worksheets and workbooks
- Data entry and editing
- Formatting worksheets
- Basic formulas and functions
- Sorting and filtering data
- Printing worksheets
- Creating charts and graphs for data presentation

UNIT-IV

15 Hours

Introduction to Operating Systems

- Concept and functions of operating systems
- Types of operating systems
- User interfaces and system management
- Role of operating systems in computer performance

Computer Networks

- Introduction to computer networking
- Types of networks:
 - Local Area Network (LAN)
 - Metropolitan Area Network (MAN)
 - Wide Area Network (WAN)
 - Internet and Intranet
- Network topologies:
 - Star
 - Ring
 - Bus
 - Mesh
 - Tree
 - Hybrid
- Components of computer networks

Internet and Its Applications

- Introduction and history of the Internet
- Internet services and applications
- E-mail and electronic communication
- File Transfer Protocol (FTP)
- Telnet and remote access
- World Wide Web (WWW)
- Web browsers and search engines
- Internet safety and responsible usage

Applications of Computers in Healthcare

- Computer applications in hospitals and clinics
- Electronic Health Records (EHR)
- Hospital Information Systems (HIS)
- Medical data management and reporting
- Telemedicine and digital healthcare services
- Role of information technology in patient care and clinical decision-making

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *P.K. Sinha & Priti Sinha – Computer Fundamentals.*
- *V. Rajaraman – Fundamentals of Computers.*
- *Anita Goel – Computer Fundamentals.*
- *Alexis Leon & Mathews Leon – Introduction to Computers.*
- *Peter Norton – Introduction to Computers.*
- *Sanjay Saxena – A First Course in Computers.*
- *Joan Lambert – Microsoft Office 365 and Office 2021 Step by Step.*
- *Ramesh Bangia – Computer Fundamentals and Information Technology.*
- *Behrouz A. Forouzan – Data Communications and Networking.*
- *R.K. Taxali – PC Software for Windows Made Simple.*

Course Title: Fundamental of Nursing	L	T	P	Cr.
Course Code: DHA204	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the fundamental concepts, principles, and scope of nursing care in healthcare settings.
2. Demonstrate understanding of patient assessment, infection control measures, first aid, and basic therapeutic nursing interventions.
3. Apply ethical principles, professional standards, and patients' rights in nursing practice.
4. Recognize the importance of spiritual care and holistic approaches in meeting the physical, psychological, social, and spiritual needs of patients.
5. Utilize the nursing process effectively for assessment, diagnosis, planning, implementation, and evaluation of patient care.

COURSE CONTENTS**UNIT-I****16 Hours****Introduction to Nursing**

- Definition, concept, and scope of nursing
- Goals and functions of nursing care
- Healthcare team and the role of nurses
- Qualities and responsibilities of a nurse

Patient Care and Assessment

- Principles of patient-centered care
- Meeting the physical, psychological, and social needs of patients
- Patient assessment and observation techniques
- Recording and reporting patient information

Infection Prevention and Control

- Concepts of infection and disease transmission
- Chain of infection
- Standard precautions and aseptic techniques
- Hand hygiene and personal protective equipment (PPE)
- Biomedical waste management

Therapeutic Nursing Care and Clinical Pharmacology

- Principles of therapeutic nursing care
- Safe medication administration
- Introduction to clinical pharmacology
- Drug classifications and routes of administration
- Medication safety and nursing responsibilities

First Aid and Emergency Care

- Importance and principles of first aid
- Management of minor injuries and common ailments
- Care of fractures and musculoskeletal injuries
- Management of life-threatening emergencies
- Community emergencies and available community resources

UNIT-II

15 Hours

Nursing as a Profession

- Historical development of nursing
- Nursing as a professional discipline
- Professional roles and responsibilities
- Characteristics and qualities of a professional nurse

Professional Etiquette and Conduct

- Professional appearance and behavior
- Communication and interpersonal relationships
- Teamwork and collaboration in healthcare settings

Ethics in Nursing

- Ethical principles in nursing practice
- Professional accountability and responsibility
- Ethical decision-making in patient care

Code of Ethics and Patients' Rights

- International Council of Nurses (ICN) Code of Ethics
- Rights and responsibilities of patients
- Confidentiality and privacy in healthcare
- Nurse's role in safeguarding patient rights and dignity

UNIT-III

14 Hours

Basic Nursing Terminology

- Common nursing and healthcare terminology
- Documentation and communication in nursing practice

Spirituality in Nursing

- Concept and importance of spirituality in healthcare
- Spiritual health and well-being
- Cultural and religious considerations in patient care

Factors Influencing Spiritual Health

- Individual beliefs and values
- Family, culture, and environment
- Illness, stress, and coping mechanisms

Spiritual Care in Nursing

- Assessment of spiritual needs
- Nursing diagnosis related to spiritual concerns
- Planning and implementing spiritual care
- Evaluation of spiritual care outcomes
- Holistic approach to patient care

UNIT-IV

15 Hours

Introduction to the Nursing Process

- Definition and characteristics of the nursing process
- Importance of systematic patient care
- Critical thinking and clinical decision-making

Phases of the Nursing Process

- **Assessment**
 - Collection of subjective and objective data
 - Patient history and physical assessment
- **Nursing Diagnosis**
 - Identification of patient problems and needs
 - Formulation of nursing diagnoses
- **Planning and Outcome Identification**
 - Setting priorities in patient care
 - Establishing measurable goals and expected outcomes
- **Implementation**

- Execution of planned nursing interventions
- Documentation of nursing care activities
- **Evaluation**
 - Assessment of patient responses to care
 - Modification of nursing care plans based on outcomes

Nursing Care Plan

- Components of a nursing care plan
- Models and formats of nursing care plans
- Preparation and application of nursing care plans in clinical settings

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Potter, P.A., Perry, A.G., Stockert, P., & Hall, A. – Fundamentals of Nursing.*
- *Kozier, B., Erb, G., Berman, A., & Snyder, S. – Fundamentals of Nursing: Concepts, Process and Practice.*
- *Basavanthappa, B.T. – Fundamentals of Nursing.*
- *Taylor, C., Lillis, C., Lynn, P., & LeMone, P. – Fundamentals of Nursing: The Art and Science of Nursing Care.*
- *Sr. Nancy – Principles and Practice of Nursing.*
- *Dutta, P. – Fundamentals of Nursing.*
- *Park, K. – Textbook of Preventive and Social Medicine.*
- *Suresh Sharma – Nursing Foundations and Fundamentals.*
- *Marilynn E. Doenges – Nursing Care Plans: Guidelines for Individualizing Patient Care.*
- *International Council of Nurses (ICN) – Code of Ethics for Nurses.*

Course Title: Mathematics and Statistics	L	T	P	Cr.
Course Code: DHA205	4	0	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Apply the concepts of set theory, real numbers, relations, and inequalities to solve mathematical problems.
2. Analyze functions, graphs, exponential and logarithmic relationships, and determine their applications in quantitative problem-solving.
3. Perform matrix operations and use determinants for solving systems of linear equations.
4. Solve problems involving coordinate geometry, straight lines, quadratic equations, and related algebraic concepts.
5. Apply differential calculus to analyze functions, determine rates of change, and solve optimization problems involving maxima and minima.

COURSE CONTENTS**UNIT-I****16 Hours****Fundamentals of Set Theory**

- Concept, definition, and representation of sets
- Types of sets and subsets
- Methods of set specification
- Venn diagrams and their applications
- Cardinality of finite sets

Operations on Sets

- Union, intersection, complement, and difference of sets
- Algebra of sets
- De Morgan's Laws
- Applications of set operations in problem-solving
- Verbal problems based on set theory

Relations and Cartesian Products

- Cartesian product of sets
- Relations and their representation
- Domain and range of relations

Real Number System

- Classification of numbers
- Real number line
- Absolute value and its properties
- Open and closed intervals
- Inequalities and their applications

UNIT-II

14 Hours

Functions and Graphs

- Concept and definition of functions
- Classification and types of functions
- Domain and range of functions
- Inverse and composite functions
- Graphical representation of functions
- Exponential and logarithmic functions

Matrices

- Definition, notation, and order of matrices
- Rows and columns of matrices
- Types of matrices and their properties
- Matrix addition, subtraction, and multiplication

Determinants

- Definition and properties of determinants
- Evaluation of determinants up to order 3×3
- Relationship between matrices and determinants
- Inverse of a matrix and its significance

UNIT-III

17 Hours

Advanced Matrix Operations

- Transpose of a matrix
- Adjoint and inverse of a matrix
- Minors and cofactors
- Properties of determinants

Applications of Matrices and Determinants

- Solution of linear systems using inverse matrix method

- Cramer's Rule for solving simultaneous equations

Coordinate Geometry of Straight Lines

- Distance between two points
- Slope of a straight line
- Angle between two lines
- Conditions for parallelism and perpendicularity
- Distance between parallel lines
- Area of a triangle using coordinates

Quadratic Equations

- Standard form of quadratic equations
- Nature of roots
- Methods of solving quadratic equations
- Applications of quadratic equations

UNIT-IV

13 Hours

Introduction to Derivatives

- Concept and definition of derivatives
- Geometrical interpretation of derivatives

Differentiation of Functions

- Derivatives of polynomial functions
- Derivatives of:
 - x^n
 - $(ax + b)^n$
 - Exponential functions
 - Logarithmic functions
 - Sine and cosine functions

Rules of Differentiation

- Sum and difference rules
- Product rule
- Quotient rule
- Chain rule
- Differentiation of algebraic functions

Applications of Derivatives

- Increasing and decreasing functions
- Stationary points
- Maximum and minimum values of functions
- Points of inflection
- Concavity and convexity of curves
- Optimization problems involving algebraic functions

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *B.S. Grewal – Higher Engineering Mathematics.*
- *R.S. Aggarwal – Senior Secondary School Mathematics (Volumes I & II).*
- *H.K. Dass – Advanced Engineering Mathematics.*
- *S. Chand & Co. – Mathematics for Degree Students.*
- *Shanti Narayan – Differential Calculus.*
- *Seymour Lipschutz – Schaum's Outline of Linear Algebra.*
- *Howard Anton – Elementary Linear Algebra.*
- *M.D. Raisinghania – Ordinary and Partial Differential Equations.*
- *S.C. Gupta & V.K. Kapoor – Fundamentals of Mathematical Statistics.*
- *R.K. Jain & S.R.K. Iyengar – Advanced Engineering Mathematics.*

Course Title: Basic Computers and Information Science (Practical)	L	T	P	Cr.
Course Code: DHA206	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Create, edit, and deliver professional presentations using Microsoft PowerPoint.
2. Perform basic operations in a computer operating system, including file and folder management.
3. Identify different types of computer networks, network topologies, and networking components.
4. Utilize internet services and web-based applications for communication, information retrieval, and academic purposes.
5. Demonstrate the application of computer technology and information systems in healthcare and clinical environments.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Microsoft PowerPoint Presentation Skills

- Introduction to Microsoft PowerPoint
- Creating a new presentation
- Working with slides and layouts
- Inserting and formatting text
- Adding images, tables, charts, and graphs
- Applying themes, transitions, and animations
- Slide show setup and presentation delivery
- Creating healthcare-related presentations

Practical 2: Operating System Fundamentals

- Introduction to operating systems
- Familiarization with Windows environment
- Managing files and folders
- Creating, copying, moving, renaming, and deleting files
- Creating desktop shortcuts
- Basic system settings and control panel operations
- Managing storage devices and drives

Practical 3: Computer Networks

- Identification of networking devices and components
- Study of network types: LAN, MAN, WAN, Internet, and Intranet
- Understanding network topologies:
 - Star topology
 - Ring topology
 - Bus topology
 - Mesh topology
 - Tree topology
 - Hybrid topology
- Basic network configuration and connectivity concepts

Practical 4: Internet and Web Applications

- Introduction to internet services
- Web browsing using popular browsers
- Effective use of search engines
- Creating and managing e-mail accounts
- Sending, receiving, and organizing e-mails
- File downloading and uploading
- Introduction to cloud-based applications
- Safe and responsible use of the internet

Practical 5: Computer Applications in Healthcare

- Introduction to healthcare information systems
- Electronic Health Records (EHR) and Electronic Medical Records (EMR)
- Hospital Information Systems (HIS)
- Digital patient registration and record management
- Online healthcare resources and databases
- Telemedicine and digital communication tools
- Data security and confidentiality in healthcare settings

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *P.K. Sinha & Priti Sinha – Computer Fundamentals.*
- *Anita Goel – Computer Fundamentals.*

- *V. Rajaraman – Fundamentals of Computers.*
- *Peter Norton – Introduction to Computers.*
- *Joan Lambert – Microsoft Office 365 and Office 2021 Step by Step.*
- *Ramesh Bangia – Computer Fundamentals and Information Technology.*
- *Alexis Leon & Mathews Leon – Introduction to Computers.*
- *Behrouz A. Forouzan – Data Communications and Networking.*
- *Sanjay Saxena – A First Course in Computers.*
- *S. Ozair, R. Jamshed & P. Sharma – Health Informatics and Hospital Information Systems.*

Course Title: Anatomy and Physiology I (Practical)	L	T	P	Cr.
Course Code: DHA207	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Identify and demonstrate anatomical landmarks, body planes, body cavities, and levels of structural organization of the human body.
2. Recognize and describe the gross anatomy of the lymphatic, nervous, muscular, and skeletal systems using models, charts, and specimens.
3. Demonstrate the anatomical structures of major organ systems including respiratory, cardiovascular, digestive, and urinary systems.
4. Correlate anatomical structures with their physiological functions in maintaining normal body activities.
5. Develop observational and practical skills necessary for healthcare and allied health science applications.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Introduction to Human Anatomy

- Identification of anatomical terminology
- Demonstration of anatomical position
- Study of anatomical planes and body regions
- Levels of structural organization in the human body
- Identification of body cavities and organ systems
- Overview of the human skeleton

Practical 2: Study of the Lymphatic System

- Identification of lymphatic vessels and lymph nodes
- Study of lymphatic tissues and organs
- Gross anatomy of spleen, thymus, and tonsils
- Functional significance of the lymphatic system

Practical 3: Study of the Nervous System

- Identification of the central nervous system
- External features of the brain and cerebellum
- Structure of the spinal cord
- Identification of cranial nerves
- Overview of the autonomic nervous system

Practical 4: Study of the Muscular System

- Classification of muscles
- Identification of skeletal, cardiac, and smooth muscles
- Major muscles of the head, trunk, upper limb, and lower limb
- Demonstration of muscle attachments and actions

Practical 5: Study of the Skeletal System

- Classification and identification of bones
- Features of long, short, flat, and irregular bones
- Study of the axial skeleton
- Study of the appendicular skeleton

Practical 6: Study of Joints and Musculoskeletal System

- Classification of joints
- Identification of major joints of upper and lower limbs
- Demonstration of joint movements
- Functional anatomy of the musculoskeletal system

Practical 7: Study of the Respiratory System

- Gross anatomy of the nose and paranasal sinuses
- Identification of pharynx, larynx, and trachea
- Anatomy of bronchi and lungs
- Demonstration of respiratory structures using models and specimens

Practical 8: Study of the Cardiovascular System

- External and internal anatomy of the heart
- Identification of major blood vessels
- Study of chambers, valves, and coronary circulation
- Demonstration of systemic and pulmonary circulation

Practical 9: Study of the Digestive System

- Anatomy of the oral cavity and salivary glands
- Identification of pharynx and oesophagus
- Gross anatomy of stomach, small intestine, and large intestine
- Study of liver, gallbladder, and pancreas
- Demonstration of digestive tract organization

Practical 10: Study of the Urinary System

- Gross anatomy of kidneys
- Identification of the juxtaglomerular apparatus
- Study of ureters, urinary bladder, and urethra

- Demonstration of the urinary drainage pathway

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *B.D. Chaurasia – Human Anatomy (Volumes I, II & III).*
- *Vishram Singh – Textbook of Anatomy (Volumes I, II & III).*
- *Ross and Wilson – Anatomy and Physiology in Health and Illness.*
- *Gerard J. Tortora & Bryan Derrickson – Principles of Anatomy and Physiology.*
- *Indu Khurana – Textbook of Human Anatomy and Physiology.*
- *A.K. Jain – Human Anatomy and Physiology for Health Sciences.*
- *Guyton & Hall – Textbook of Medical Physiology.*
- *Sembulingam & Sembulingam – Essentials of Medical Physiology.*
- *Netter – Atlas of Human Anatomy.*
- *McMinn & Abrahams – Clinical Atlas of Human Anatomy.*

3RD SEMESTER

Course Title: Anatomy and Physiology II	L	T	P	Cr.
Course Code: DHA301	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Describe the anatomy of the reproductive, endocrine, sensory, nervous, cardiovascular, respiratory, digestive, urinary, and lymphatic systems.
2. Explain the structural and functional organization of cells, tissues, blood, and body systems in maintaining homeostasis.
3. Interpret physiological mechanisms involved in immunity, neural control, respiration, circulation, digestion, excretion, reproduction, and endocrine regulation.
4. Explain the principles of genetics, inheritance, and molecular biology relevant to human health and disease.
5. Correlate anatomical structures with physiological functions and apply this knowledge in healthcare and allied health science practice.

COURSE CONTENTS**UNIT-I****14 Hours****Introduction to Human Genetics**

- Structure and organization of chromosomes
- DNA structure and function
- Basic concepts of heredity and genetic information

Reproductive System

- Female Reproductive System
 - External and internal genital organs
 - Ovaries, uterus, fallopian tubes, vagina
 - Structure and functions of the breast
- Male Reproductive System
 - Penis and scrotum
 - Testes and accessory reproductive glands
 - Prostate gland and reproductive ducts

Endocrine System

- Overview of hormones and endocrine regulation
- Pituitary gland
- Thyroid and parathyroid glands
- Adrenal glands
- Endocrine pancreas

Cellular and Tissue Organization

- Review of anatomical terminology and body organization
- Cell structure and cellular organelles
- Cell membrane and nucleus
- Epithelial, connective, muscular, and nervous tissues

Blood and Lymphatic System

- Composition and functions of blood
- Erythrocytes, leukocytes, and platelets
- Lymphatic vessels and lymphatic circulation
- Spleen, thymus, and tonsils

UNIT-II

16 Hours

Nervous System

- Central and peripheral nervous systems
- Brain, cerebellum, and spinal cord
- Cranial nerves
- Autonomic nervous system

Musculoskeletal System

- Skeletal, cardiac, and smooth muscles
- Structure and classification of bones
- Axial and appendicular skeleton
- Joints of upper and lower limbs

Respiratory System

- Nose and paranasal sinuses
- Pharynx, larynx, and trachea
- Bronchial tree and lungs

Cardiovascular System

- Structure of the heart

- Blood vessels and circulation

Digestive System

- Oral cavity and salivary glands
- Pharynx and oesophagus
- Stomach and intestines
- Liver, gallbladder, and pancreas

Urinary System

- Kidneys and juxtaglomerular apparatus
- Ureters, urinary bladder, and urethra

Special Senses and Integumentary System

- Olfactory and gustatory systems
- External, middle, and internal ear
- Eye and visual apparatus
- Structure of skin, hair, nails, sweat glands, and sebaceous glands

UNIT-III

15 Hours

Introduction to Physiology

- Composition of the human body
- Homeostasis and regulatory mechanisms
- Basic chemistry of life

Cellular and Tissue Physiology

- Physiological roles of carbohydrates, proteins, and lipids
- Functions of cellular organelles
- Physiology of epithelial, connective, muscular, and nervous tissues

Blood and Immune System

- Haemopoiesis
- Haemostasis and blood coagulation
- Blood groups and transfusion
- Functions of lymphatic organs and tissues
- Innate and acquired immunity
- Humoral and cell-mediated immunity

Nervous and Muscular Physiology

- Properties of nerve fibres
- Neuroglia and synaptic transmission
- Cerebrospinal fluid and brain functions
- Reflex actions and cranial nerve functions
- Physiology of skeletal, cardiac, and smooth muscles

Respiratory Physiology

- Mechanism of respiration
- Pulmonary function tests
- Gas exchange and transport
- Regulation of respiration

UNIT-IV

15 Hours

Cardiovascular Physiology

- Cardiac cycle
- Systemic and pulmonary circulation
- Electrocardiography (ECG)
- Cardiac output
- Regulation of blood pressure

Digestive Physiology

- Digestion and absorption of nutrients
- Functions of digestive organs
- Physiological roles of liver, gallbladder, and pancreas

Urinary Physiology

- Renal functions
- Urine formation
- Glomerular filtration and tubular reabsorption
- Water and electrolyte balance
- Physiology of micturition

Genetics and Molecular Biology

- DNA replication and protein synthesis
- Patterns of inheritance
- Dominant and recessive inheritance
- Sex-linked inheritance

Reproductive Physiology

- Physiology of the female reproductive system
- Physiology of the male reproductive system

Endocrine Physiology

- Mechanism of hormone action
- Physiological functions of endocrine glands

Special Senses and Skin

- Physiology of smell and taste
- Hearing and equilibrium
- Vision and visual pathways
- Functions of skin and skin appendages
- Temperature regulation and homeostasis

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Tortora GJ, Derrickson B. *Principles of Anatomy and Physiology*. 16th ed. Hoboken (NJ): John Wiley & Sons; 2021.
- Hall JE. *Guyton and Hall Textbook of Medical Physiology*. 15th ed. Philadelphia: Elsevier; 2025.
- Wilson K, Waugh A. *Ross and Wilson Anatomy and Physiology in Health and Illness*. 14th ed. Edinburgh: Elsevier; 2023.
- Khurana I. *Textbook of Human Anatomy and Physiology for Health Sciences*. 3rd ed. New Delhi: CBS Publishers & Distributors; 2020.
- Sembulingam K, Sembulingam P. *Essentials of Medical Physiology*. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.

Course Title: Pharmacology and Pharmacy I	L	T	P	Cr.
Course Code: DHA302	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Describe the pharmacological properties, indications, contraindications, adverse effects, and clinical applications of commonly used anesthetic and perioperative drugs.
2. Explain the mechanism of action, dosage forms, routes of administration, and therapeutic uses of sedatives, analgesics, antiemetics, and induction agents.
3. Differentiate between various muscle relaxants, inhalational anesthetic agents, local anesthetics, and reversal drugs used in clinical practice.
4. Demonstrate knowledge of emergency drugs, cardiovascular medications, bronchodilators, and diuretics used during critical care and anesthetic management.
5. Apply principles of safe drug administration, drug dilution, dosage calculation, monitoring, and management of drug-related complications in healthcare settings.

COURSE CONTENTS**UNIT-I****15 Hours****Principles of Pharmacology**

- Introduction to pharmacology and pharmacy
- Drug nomenclature and classification
- Routes of drug administration
- Pharmacokinetics and pharmacodynamics
- Drug safety and adverse drug reactions

Antisialagogues

- Classification and mechanism of action
- Clinical uses and adverse effects of:
 - Atropine
 - Glycopyrrolate

Sedatives and Anxiolytics

- Pharmacological actions and therapeutic applications of:
 - Diazepam
 - Midazolam

- Lorazepam
- Promethazine (Phenergan)
- Chlorpromazine
- Triclofos

Opioid and Non-Opioid Analgesics

- Mechanism of action, indications, and adverse effects of:
 - Morphine
 - Pethidine
 - Fentanyl
 - Pentazocine
 - Tramadol

Antiemetic Drugs

- Pharmacology and clinical applications of:
 - Metoclopramide
 - Ondansetron
 - Dexamethasone

UNIT-II

15 Hours

Intravenous Induction Agents

- Characteristics of ideal induction agents
- Pharmacology of:
 - Thiopentone Sodium
 - Diazepam
 - Midazolam
 - Ketamine
 - Propofol
 - Etomidate

Muscle Relaxants

- Principles of neuromuscular blockade
- Depolarizing muscle relaxants:
 - Succinylcholine (Suxamethonium)
- Non-depolarizing muscle relaxants:
 - Vecuronium
 - Atracurium
 - Rocuronium

Inhalational Anesthetic Agents

- Medical gases used in anesthesia:
 - Oxygen (O₂)
 - Nitrous Oxide (N₂O)
 - Medical Air
- Volatile anesthetic agents:
 - Ether
 - Halothane
 - Isoflurane
 - Sevoflurane
 - Desflurane

Reversal Agents

- Mechanism of action and clinical applications of:
 - Neostigmine
 - Glycopyrrolate
 - Atropine
 - Naloxone
 - Flumazenil

UNIT-III

14 Hours

Local Anesthetic Agents

- Classification and mechanism of action
- Clinical uses and complications of:
 - Lidocaine (Xylocaine)
 - Bupivacaine
 - Prilocaine
 - EMLA Cream/Ointment
 - Etidocaine
 - Ropivacaine

Techniques of Local Anesthesia

- Topical anesthesia
- Infiltration anesthesia
- Nerve block techniques
- Safety precautions and toxicity management

Emergency Drugs

- Principles of emergency drug administration
- Drug preparation, dilution, dosage calculations, and routes of administration

Commonly Used Emergency Medications

- Adrenaline (Epinephrine)
- Atropine
- Ephedrine
- Mephentermine
- Sodium Bicarbonate
- Calcium preparations
- Potassium preparations

Management of Drug Emergencies

- Anaphylaxis
- Cardiac arrest
- Bradycardia and hypotension
- Electrolyte imbalances

UNIT-IV

16 Hours

Inotropic and Cardiovascular Drugs

- Mechanism of action, indications, and adverse effects of:
 - Dopamine
 - Dobutamine
 - Amiodarone
 - Nitroglycerin
 - Sodium Nitroprusside

Antihypertensive Drugs

- Classification and therapeutic applications
- Beta-adrenergic blockers
- Calcium channel blockers

Antiarrhythmic Drugs

- Principles of antiarrhythmic therapy
- Lidocaine (Xylocard)
- Amiodarone

Respiratory System Pharmacology

- Bronchodilators and their clinical uses
- Aminophylline
- Management of bronchospasm and respiratory emergencies

Anti-inflammatory and Antiallergic Agents

- Hydrocortisone
- Antihistamines
- Clinical applications in emergency and perioperative care

Renal Pharmacology

- Diuretics and their mechanisms of action
- Furosemide (Frusemide)
- Mannitol
- Clinical uses in fluid and electrolyte management

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Stoelting RK, Hillier SC. Pharmacology and Physiology in Anesthetic Practice. 6th ed. Philadelphia: Wolters Kluwer; 2021.*
- *Butterworth JF, Mackey DC, Wasnick JD. Morgan and Mikhail's Clinical Anesthesiology. 7th ed. New York: McGraw-Hill Education; 2022.*
- *Peck TE, Hill SA, Williams M. Pharmacology for Anaesthesia and Intensive Care. 5th ed. Cambridge: Cambridge University Press; 2020.*
- *Golan DE, Armstrong EJ, Armstrong AW. Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy. 5th ed. Philadelphia: Wolters Kluwer; 2023.*
- *Waugh A, Grant A. Ross and Wilson Anatomy and Physiology in Health and Illness. 14th ed. Edinburgh: Elsevier; 2023.*

Course Title: Gynecology and Obstetrics	L	T	P	Cr.
Course Code: DHA303	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Describe the anatomy, physiology, and assessment of the female reproductive system and identify common gynecological disorders.
2. Explain the etiology, clinical manifestations, diagnosis, prevention, and management of common diseases affecting the female reproductive and urinary systems.
3. Demonstrate understanding of family planning methods, infertility evaluation, and assisted reproductive technologies.
4. Interpret the physiological changes during pregnancy, fetal development, antenatal care, and complications associated with pregnancy.
5. Explain the principles of labor, delivery, newborn care, postnatal care, and management of obstetric emergencies and complications.

COURSE CONTENTS

UNIT-I

15 Hours

Gynecological Assessment and Examination

- Gynecological history taking
- Physical examination of female patients
- Terminology related to gynecological health and disease
- Examination of the breast, vulva, vagina, cervix, uterus, fallopian tubes, and ovaries
- Patient education and counseling in gynecological practice

Diagnostic Procedures in Gynecology and Obstetrics

- Ultrasonography in obstetrics and gynecology
- Cervical cytology (Pap smear)
- Colposcopy and cervical biopsy
- Breast self-examination and breast health awareness

Menstrual Disorders

- Physiology of menstruation
- Dysmenorrhea
- Premenstrual syndrome
- Menorrhagia

- Metrorrhagia
- Dysfunctional uterine bleeding
- Menopausal disorders and their management
- Identification of serious menstrual abnormalities requiring referral

Disorders of the Breast

- Anatomy and development of the breast
- Physiological changes during pregnancy and lactation
- Breastfeeding-related problems:
 - Cracked nipples
 - Mastitis
 - Breast abscess
- Breast masses: classification, clinical features, diagnosis, and management
- Eczema and other benign breast conditions

Genital Prolapse

- Definition, classification, and stages
- Etiology and risk factors
- Clinical features and complications
- Assessment and diagnosis
- Prevention and management strategies

UNIT-II

13 Hours

Disorders of the Vulva, Vagina, and Cervix

- Common vaginal infections:
 - Candidiasis
 - Trichomoniasis
 - Gonococcal infections
 - Bacterial vaginosis
- Sexually transmitted infections (STIs)
- National guidelines for STI management
- Long-term consequences of untreated reproductive tract infections

Disorders of Internal Reproductive Organs

- Endometriosis
- Endometrial hyperplasia and fibrosis
- Benign and malignant uterine tumors
- Disorders of fallopian tubes and ovaries

- Pelvic inflammatory disease (PID)
- Relationship between PID and sexually transmitted infections

Female Urinary Tract Disorders

- Anatomy and physiology of the female urinary tract
- Upper and lower urinary tract infections
- Clinical features, differential diagnosis, and management
- Urinary incontinence and urinary retention
- Prevention of pelvic floor dysfunction

Family Planning and Contraception

- Principles of family planning
- Natural, barrier, hormonal, intrauterine, and permanent contraceptive methods
- Indications, contraindications, adverse effects, and complications
- Counseling for contraceptive use

Infertility and Assisted Reproduction

- Definition and causes of infertility
- Male and female factors affecting fertility
- Diagnostic evaluation of infertile couples
- Semen analysis
- Polycystic Ovary Syndrome (PCOS)
- Assisted reproductive technologies
- In Vitro Fertilization (IVF)

UNIT-III

17 Hours

Physiology of Pregnancy

- Fertilization and conception
- Embryonic and fetal development
- Placental development and functions
- Fetal circulation

Diagnosis and Monitoring of Pregnancy

- Clinical diagnosis of pregnancy
- Estimation of gestational age
- Expected date of delivery (EDD)
- Assessment of fetal well-being

- Antenatal investigations and screening tests

Antenatal Care

- Nutritional requirements during pregnancy
- Immunization during pregnancy
- Health education and counseling
- Management of common discomforts of pregnancy
- Teratogenic agents and their effects

Complications of Pregnancy

- Hyperemesis gravidarum
- Ectopic pregnancy
- Placenta previa
- Polyhydramnios
- Multiple pregnancy
- Hydatidiform mole
- Hypertensive disorders of pregnancy
- Premature rupture of membranes
- Cephalopelvic disproportion
- Malpresentations and incompatibility disorders

Maternal Medical Disorders in Pregnancy

- Anemia
- Diabetes mellitus
- Heart disease
- Tuberculosis
- Jaundice
- Endocrine disorders
- Renal and urinary tract diseases
- Effects of substance abuse and malnutrition

Abortion

- Types of abortion:
 - Threatened
 - Spontaneous
 - Induced
 - Complete
 - Incomplete
 - Septic abortion
- Clinical management and referral protocols

Normal Labor and Delivery

- Anatomy and physiology of labor
- Stages of labor
- Monitoring labor progression
- Principles of normal delivery
- Active management of the third stage of labor

UNIT-IV

15 Hours

Complications of Labor and Delivery

- Preterm labor
- Prolonged and obstructed labor
- Maternal and fetal distress
- Breech presentation
- Cord prolapse and hand prolapse
- Retained placenta
- Postpartum hemorrhage
- Uterine inversion and rupture
- Birth canal injuries

Management of Obstetric Emergencies

- Prevention and treatment of uterine atony
- Uterine massage techniques
- Oxytocin administration
- Manual removal of retained placenta
- Prevention of labor-related complications

Essential Newborn Care

- Immediate care of the newborn
- APGAR scoring system
- Thermoregulation and hypothermia prevention
- Umbilical cord care
- Initiation and benefits of breastfeeding
- Neonatal resuscitation
- Management of neonatal infections

Postnatal Care

- Physiological changes during puerperium
- Monitoring maternal recovery

- Postpartum counseling and health education

Postpartum Complications

- Puerperal sepsis
- Breast infections
- Deep vein thrombosis
- Wound infection
- Urinary tract infection
- Fistula
- Postpartum depression and puerperal psychosis

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Beckmann CRB, Ling FW, Smith RP, Barzansky BM, Herbert WNP, Laube DW. *Obstetrics and Gynecology*. 9th ed. Philadelphia: Wolters Kluwer; 2024.
- World Health Organization. *Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors*. 3rd ed. Geneva: WHO; 2023.
- Fraser DM, Cooper MA, Nolte AGW. *Myles Textbook for Midwives*. 18th ed. Edinburgh: Elsevier; 2023.
- Ten Teachers. *Obstetrics by Ten Teachers*. 21st ed. Boca Raton: CRC Press; 2023.
- Ten Teachers. *Gynaecology by Ten Teachers*. 21st ed. Boca Raton: CRC Press; 2024.

Course Title: Zoology	L	T	P	Cr.
Course Code: DHA304	3	1	0	4

Total Hours 60 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the scope, branches, and importance of zoology in medical and health sciences.
2. Describe the structure, functions, and distribution of animal tissues and their role in maintaining normal body functions.
3. Apply principles of taxonomy and classification to identify organisms of medical importance and explain host-parasite relationships.
4. Describe the morphology, life cycle, pathogenicity, transmission, and prevention of medically important protozoan, helminthic, and arthropod parasites.
5. Explain the concepts of evolution, wildlife conservation, and biodiversity, and relate them to human health and environmental sustainability.

COURSE CONTENTS**UNIT-I****15 Hours****Introduction to Zoology**

- Definition, scope, and significance of zoology
- Relationship of zoology with medical and health sciences

Branches of Zoology

- **Based on Structure and Function**

- Morphology
- Anatomy
- Physiology
- Histology
- Cytology

- **Based on Specialized Fields**

- Toxicology
- Genetics
- Embryology
- Evolution
- Mycology
- Microbiology
- Ecology

- Parasitology
- Paleontology
- Taxonomy
- **Based on Animal Groups**
 - Entomology
 - Helminthology
 - Protozoology
 - Bacteriology
 - Virology

Animal Tissues

- **Epithelial Tissue**
 - Definition, classification, structure, and functions
 - Protection, secretion, excretion, absorption, exchange, and sensory functions
- **Connective Tissue**
 - Structure, classification, and functions
 - Distribution in different regions of the body
 - Blood as a specialized connective tissue
 - Composition and functions of blood and plasma
- **Muscular Tissue**
 - Structure and functions of skeletal, smooth, and cardiac muscles
 - Comparative study of different muscle types
 - Distribution of muscular tissues in the body
- **Nervous Tissue**
 - Structure and organization of neurons and neuroglia
 - Types and functions of nervous tissues
 - Role in coordination and control of body functions

UNIT-II

14 Hours

Principles of Taxonomy and Classification

- Definition and importance of taxonomy
- Species as the basic unit of classification
- Concept of systematics and taxonomic hierarchy
- Taxa: lower and higher categories

Systems of Classification

- Artificial and natural systems of classification
- Modern trends in taxonomy
- Binomial nomenclature and its significance

- Contributions of Carolus Linnaeus
- Examples of scientific names of medically important organisms

Five Kingdom Classification

- Characteristics of five kingdoms
- Comparative study and examples

Host-Parasite Relationships

- Definition of host and parasite
- Types of hosts and parasites
- Host-parasite interactions
- Adaptations and survival mechanisms of parasites

Medically Important Protozoa

- **Study of the following with respect to:**
 - Classification and systematic position
 - Distribution and habitat
 - Morphology
 - Life cycle
 - Mode of transmission
 - Pathogenic effects
 - Prevention and control
- **Protozoan Parasites**
 - *Entamoeba histolytica*
 - *Entamoeba gingivalis*
 - *Giardia lamblia*
 - *Trichomonas vaginalis*
 - *Plasmodium vivax*

UNIT-III

16 Hours

Medically Important Helminths

Study of the following parasites with reference to morphology, life cycle, transmission, pathogenicity, diagnosis, prevention, and control:

- **Cestodes**
 - *Taenia solium*
 - *Taenia saginata*
 - *Hymenolepis nana*
 - *Echinococcus granulosus*
- **Nematodes**

- *Ascaris lumbricoides*
- *Ancylostoma duodenale*
- *Wuchereria bancrofti*
- *Trichuris trichiura*
- *Enterobius vermicularis*

Medical Entomology

- **Introduction and Classification**

- Medically important arthropods
- Public health significance

- **Arthropods of Medical Importance**

Study of distribution, habitat, morphology, disease transmission, and control measures of:

- Mange mite (*Sarcoptes scabiei*)
- Cockroach (*Periplaneta americana*)
- Housefly (*Musca domestica*)
- Mosquitoes:
 - *Anopheles*
 - *Culex*
 - *Aedes*
- Sand fly (*Phlebotomus argentipes*)
- Human louse (*Pediculus humanus*)
- Bed bug (*Cimex lectularius*)
- Rat flea (*Xenopsylla cheopis*)

Vector Control

- Principles of vector control
- Integrated Vector Management (IVM)
- Environmental, biological, and chemical control measures

UNIT-IV

15 Hours

Origin of Life

- Concepts and theories regarding the origin of life
- Overview of biological evolution

Organic Evolution

- Definition and patterns of evolution
- Evidence supporting evolution:
 - Morphological evidence

- Anatomical evidence
- Paleontological evidence
- Biochemical evidence
- Embryological evidence

Theories of Evolution

- **Lamarckism**
 - Theory of inheritance of acquired characters
 - Merits and limitations
- **Darwinism**
 - Theory of natural selection
 - Contributions and limitations
- **Neo-Darwinism**
 - Modern synthetic theory of evolution
 - Genetic basis of evolution

Human Evolution

- Evolutionary history of humans
- Major stages from *Dryopithecus* to modern humans
- Characteristics of important ancestral forms

Wildlife Conservation

- Definition and importance of wildlife
- Biodiversity and ecological significance
- Categories of wildlife with examples
- Causes of wildlife depletion and extinction
- Protected areas:
 - National Parks
 - Wildlife Sanctuaries
 - Biosphere Reserves
- Conservation strategies and sustainable management

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Jordan EL, Verma PS. Invertebrate Zoology. 15th ed. New Delhi: S Chand Publishing; 2020.*
- *Jordan EL, Verma PS. Chordate Zoology and Elements of Animal Physiology. 15th ed. New Delhi: S Chand Publishing; 2020.*
- *Kotpal RL. Modern Textbook of Zoology: Invertebrates. New Delhi: Rastogi Publications; 2022.*
- *Kotpal RL. Modern Textbook of Zoology: Vertebrates. New Delhi: Rastogi Publications; 2022.*
- *Chatterjee KD. Parasitology (Protozoology and Helminthology). 14th ed. New Delhi: CBS Publishers & Distributors; 2021.*

Course Title: Environmental Health	L	T	P	Cr.
Course Code: DHA305	4	0	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the concepts of environment, environmental health, sanitation, pollution, and their significance in public health.
2. Identify environmental hazards and assess the impact of industrialization, urbanization, agriculture, and climate change on human health.
3. Describe various forms of environmental pollution, their sources, health effects, and preventive measures.
4. Apply principles of waste management, biomedical waste management, and environmental protection in healthcare settings.
5. Recognize food-borne and occupational diseases and recommend appropriate preventive and control measures to promote community health.

COURSE CONTENTS

UNIT-I

15 Hours

Introduction to Environmental Health

- Definition of environment and ecosystem
- Concept of environmental health
- Environmental sanitation and hygiene
- Environmental pollution and its significance
- Relationship between environment and human health

Promotion of Environmental Health

- Individual and community responsibilities
- Public health measures for environmental protection
- Sustainable environmental practices

Environmental Hazards and Health Risks

- Definition and classification of environmental hazards
- Physical, chemical, biological, and social hazards
- Environmental threats and risk factors
- Impact of environmental hazards on human health

Environmental Changes and Public Health

- Agricultural intensification and health effects
- Industrialization and environmental health
- Energy production, energy crisis, and health implications
- Urbanization and environmental challenges

Climate Change and Health

- Causes of climate change
- Global warming and greenhouse effect
- Health consequences of climate change
- Strategies for climate change adaptation and mitigation

UNIT-II

15 Hours

Environmental Pollution

- Concept and significance of environmental pollution
- Environmental pollution as a public health problem
- Global and national environmental concerns

Types of Environmental Pollution

- Air pollution
- Water pollution
- Soil pollution
- Noise pollution
- Chemical pollution
- Pesticide pollution
- Radioactive pollution

Water Pollution

- Definition and causes of water pollution
- Sources of water contamination
- Types of water pollutants:
 - Physical pollutants
 - Chemical pollutants
 - Biological pollutants
- Health effects of contaminated water

Prevention and Control of Water Pollution

- Primary prevention measures
- Secondary prevention measures

- Prevention of water-borne diseases
- Water quality standards and monitoring

Sources of Water Supply

- Rainwater
- Surface water sources
- Groundwater sources
- Shallow wells
- Deep wells
- Springs
- Protection and purification of drinking water

UNIT-III

14 Hours

Waste Management

- Definition and importance of waste management
- Classification of waste

Types of Waste

- Solid waste
- Liquid waste
- Hazardous waste
- Biomedical waste
- Biodegradable and non-biodegradable waste

Waste Reduction Strategies

- Principles of waste minimization
- 3R Concept:
 - Reduce
 - Reuse
 - Recycle
- Community participation in waste reduction

Waste Handling and Disposal

- Collection of waste
- Storage and segregation
- Transportation of waste
- Treatment and disposal methods

Healthcare and Laboratory Waste Management

- Environmental hazards associated with healthcare waste
- Infectious waste
- Chemical waste
- Radioactive waste
- Sharps and miscellaneous hazardous waste

Hospital Waste Management

- Hazards of hospital waste
- Biomedical waste segregation
- Color-coding system
- Incineration and alternative disposal methods
- Mercury waste management
- WHO guidelines for healthcare waste management

UNIT-IV

16 Hours

Food-Borne Diseases

- Definition and classification
- Food intoxication and food infection
- Public health importance

Food Intoxication

- Bacterial food poisoning
- Plant toxin poisoning
- Chemical food poisoning
- Prevention and control measures

Food-Borne Infections

- Common microbial food-borne infections
- Modes of transmission
- Prevention and control

Food Contamination

- Definition and causes
- Sources of food contamination:
 - Human factors
 - Environmental factors
- Safe food handling practices

Occupational Health

- Concept and importance of occupational health
- Occupational hazards and risk assessment

Occupational Diseases

- Diseases Due to Physical Agents
 - Heat and cold exposure
 - Noise-induced disorders
 - Radiation-related diseases
 - Vibration-related disorders
- Diseases Due to Chemical Agents
 - Heavy metal poisoning
 - Solvent exposure
 - Pesticide-related illnesses
- Diseases Due to Biological Agents
 - Occupational infections
 - Healthcare-associated occupational diseases

Prevention of Occupational Diseases

- Workplace safety measures
- Personal protective equipment (PPE)
- Occupational health surveillance
- Health education and awareness programs

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *World Health Organization. Safe Management of Wastes from Health-Care Activities. 3rd ed. Geneva: World Health Organization; 2024.*
- *World Health Organization. Guidelines on Sanitation and Health. Geneva: World Health Organization; 2018.*
- *National Institute of Occupational Safety and Health. Fundamentals of Occupational Safety and Health. Geneva: International Labour Organization; 2023.*
- *Detels R, Gulliford M, Karim QA, Tan CC. Oxford Textbook of Global Public Health. 7th ed. Oxford: Oxford University Press; 2021.*

- *Goel SL. Environmental Health and Hygiene. New Delhi: Deep & Deep Publications; 2021.*

Course Title: Anatomy and Physiology II (Practical)	L	T	P	Cr.
Course Code: DHA306	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Identify and demonstrate the anatomical structures of major human body systems using models, specimens, charts, and laboratory resources.
2. Describe the gross anatomy of the nervous, musculoskeletal, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and lymphatic systems.
3. Recognize the anatomical relationships between organs and body systems and correlate them with their physiological functions.
4. Demonstrate basic practical skills in anatomical identification and interpretation of human body structures relevant to healthcare practice.
5. Apply anatomical and physiological knowledge in understanding normal human body functions and clinical procedures.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Introduction to Human Anatomy

- Anatomical terminology and anatomical position
- Anatomical planes and body regions
- Levels of structural organization of the human body
- Identification of body cavities
- Overview of organ systems
- Introduction to the human skeleton

Practical 2: Study of the Lymphatic System

- Identification of lymphatic vessels and lymph nodes
- Gross anatomy of spleen, thymus, and tonsils
- Demonstration of lymphatic organs and tissues
- Functional significance of the lymphatic system

Practical 3: Study of the Nervous System

- Gross anatomy of the brain and cerebellum
- Structure of the spinal cord
- Identification of cranial nerves

- Demonstration of central and peripheral nervous systems
- Overview of the autonomic nervous system

Practical 4: Study of the Muscular System

- Identification of skeletal, cardiac, and smooth muscles
- Classification of muscles
- Major muscles of the head, neck, trunk, and limbs
- Demonstration of muscle attachments and actions

Practical 5: Study of the Skeletal System

- Classification and identification of bones
- Features of long, short, flat, and irregular bones
- Study of axial skeleton
- Study of appendicular skeleton

Practical 6: Study of Joints and Musculoskeletal System

- Classification of joints
- Identification of major joints of upper and lower limbs
- Demonstration of movements at different joints
- Functional anatomy of the musculoskeletal system

Practical 7: Study of the Respiratory System

- Anatomy of the nose and paranasal sinuses
- Identification of pharynx, larynx, trachea, bronchi, and lungs
- Demonstration of respiratory structures using models and charts

Practical 8: Study of the Cardiovascular System

- External and internal anatomy of the heart
- Identification of chambers, valves, and major blood vessels
- Demonstration of systemic and pulmonary circulation

Practical 9: Study of the Digestive System

- Anatomy of oral cavity and salivary glands
- Identification of pharynx, oesophagus, stomach, and intestines
- Gross anatomy of liver, gallbladder, and pancreas
- Demonstration of the digestive tract and accessory organs

Practical 10: Study of the Urinary System

- Gross anatomy of kidneys
- Identification of the juxtaglomerular apparatus

- Anatomy of ureters, urinary bladder, and urethra
- Demonstration of the urinary drainage pathway

Practical 11: Basic Human Genetics

- Structure and identification of chromosomes
- Introduction to DNA and genetic material
- Demonstration of chromosomal organization and heredity concepts

Practical 12: Study of the Female Reproductive System

- External female genital organs
- Internal reproductive organs
- Structure of ovaries, uterus, fallopian tubes, and vagina
- Anatomy of the breast and mammary glands

Practical 13: Study of the Male Reproductive System

- Anatomy of penis and scrotum
- Structure of testes and epididymis
- Identification of prostate gland and accessory reproductive organs

Practical 14: Study of the Endocrine System

- Identification of endocrine glands
- Pituitary gland
- Thyroid and parathyroid glands
- Adrenal glands
- Endocrine pancreas
- Correlation of endocrine structures with hormone secretion

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Sembulingam K, Sembulingam P. Essentials of Medical Physiology. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Snell RS. Clinical Anatomy by Regions. 11th ed. Philadelphia: Wolters Kluwer; 2024.*

- *Drake RL, Vogl W, Mitchell AWM. Gray's Anatomy for Students. 5th ed. Philadelphia: Elsevier; 2023.*
- *Moore KL, Dalley AF, Agur AMR. Clinically Oriented Anatomy. 9th ed. Philadelphia: Wolters Kluwer; 2023.*
- *Mescher AL. Junqueira's Basic Histology: Text and Atlas. 17th ed. New York: McGraw-Hill Education; 2024.*

Course Title: Zoology (Practical)	L	T	P	Cr.
Course Code: DHA307	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate proper handling and use of laboratory equipment, including microscopes and dissection instruments.
2. Prepare and examine temporary mounts of biological specimens and identify their structural features under a microscope.
3. Identify medically important arthropods and explain their morphology, life cycles, and public health significance.
4. Perform basic physiological observations such as measurement of blood pressure and use of clinical instruments.
5. Recognize major human organ systems through charts, models, and demonstrations and relate their structure to biological functions.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Practical 1: Study of Compound Microscope

- Identification of different parts of the microscope
- Functions of microscope components
- Principles of magnification and illumination
- Handling, focusing, and maintenance of the microscope
- Observation techniques for biological specimens

Practical 2: Preparation and Observation of Temporary Mounts

- Preparation of temporary mount of striated muscle tissue
- Microscopic examination of striated muscle fibers
- Temporary mounts and identification of:
 - Bed Bug (*Cimex lectularius*)
 - Flea (*Xenopsylla cheopis*)
 - Human Louse (*Pediculus humanus*)
- Observation of distinguishing morphological features

Practical 3: Zoological Laboratory Instruments

- Identification and use of dissection instruments
- Forceps, scissors, scalpels, dissecting needles, probes, and trays
- Care, maintenance, and safety precautions during laboratory work

Practical 4: Techniques of Animal Dissection

- Principles and objectives of dissection
- Basic techniques for mammalian dissection
- Identification of major anatomical structures during demonstration
- Ethical and safety considerations in animal handling

Practical 5: Clinical Demonstration of Physiological Parameters

- Identification and use of a stethoscope
- Measurement of pulse and heart sounds
- Measurement of human blood pressure using sphygmomanometer
- Interpretation of normal blood pressure readings

Practical 6: Life Cycle Study of Mosquitoes and Housefly

- Observation of developmental stages of:
 - *Anopheles* mosquito
 - *Culex* mosquito
 - Housefly (*Musca domestica*)
- Identification of egg, larval, pupal, and adult stages
- Comparative study of mosquito and housefly life cycles

Practical 7: Identification of Vector Life Cycle Stages

- Morphological characteristics of each developmental stage
- Distinguishing features of larvae, pupae, and adults
- Public health importance of disease vectors
- Relationship between life cycle stages and disease transmission

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Paniker CKJ, Ghosh S. *Paniker's Textbook of Medical Parasitology*. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.
- Jordan EL, Verma PS. *Practical Zoology: Invertebrates*. New Delhi: S Chand Publishing; 2021.
- Jordan EL, Verma PS. *Practical Zoology: Chordates*. New Delhi: S Chand Publishing; 2021.

- *Kotpal RL. Laboratory Manual of Zoology. New Delhi: Rastogi Publications; 2022.*
- *Hickman CP Jr, Keen SL, Eisenhour DJ, Larson A, I'Anson H. Integrated Principles of Zoology. 19th ed. New York: McGraw-Hill Education; 2023.*

4TH SEMESTER

Course Title: Epiderminology and Community Diagnosis	L	T	P	Cr.
Course Code: DHA401	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the fundamental concepts, principles, and methods of epidemiology and their applications in public health practice.
2. Describe the epidemiological determinants of disease occurrence, transmission, prevention, and control.
3. Apply epidemiological measurements, screening methods, and surveillance techniques in community health settings.
4. Analyze cultural, social, environmental, and behavioral factors influencing health and disease in communities.
5. Conduct community diagnosis using appropriate tools, data collection techniques, and health assessment methods.
6. Assess community health needs and formulate evidence-based micro health projects for community development.
7. Demonstrate understanding of community participation, health promotion strategies, and decentralized health service management.
8. Evaluate public health interventions related to nutrition, immunization, maternal and child health, and disease prevention programs.

COURSE CONTENTS

UNIT-I

14 Hours

Concepts and Methods of Epidemiology

- Definition, scope, and importance of epidemiology.
- Basic epidemiological terms: infection, infectious disease, epidemic, endemic, sporadic disease, pandemic, exotic infection, opportunistic infection, source of infection, reservoir of infection, and iatrogenic infection.
- Concepts of rate, ratio, proportion, surveillance, control, eradication, and elimination of diseases.
- Concepts of disease causation:
 - Germ Theory
 - Epidemiological Triad

- Multifactorial Causation
- Web of Causation
- Risk factors and risk groups associated with diseases.
- Natural history of disease and levels of prevention.
- Components of the epidemiological triad: Agent, Host, and Environment.
- Purpose and functions of epidemiology.
- Epidemiological measurements and indicators.
- Descriptive epidemiology: principles, objectives, and methodology.
- Distribution of disease according to time, place, and person.
- Screening:
 - Concept and objectives of screening
 - Principles and methods of screening
 - Criteria for screening programs
 - Selection of diseases for screening
 - Common screening tests and target populations.

UNIT-II

15 Hours

Dynamics of Disease Transmission

- Chain of infection and disease transmission cycle.
- Reservoirs of infection:
 - Human reservoirs
 - Animal reservoirs
 - Environmental and non-living reservoirs
- Modes of disease transmission:
 - Direct transmission
 - Indirect transmission
- Examples of diseases transmitted through different routes.
- Incubation period and period of communicability.
- Susceptibility and host factors in disease occurrence.
- Incubation and communicable periods of common infectious diseases.

Prevention and Control of Infectious Diseases

- Control of reservoirs of infection.
- Interruption of disease transmission.
- Protection of susceptible hosts.
- Disease-specific prevention and control strategies.

Epidemics

- Characteristics and types of infectious disease epidemics.
- Principles of epidemic investigation.
- Steps in outbreak investigation and management.
- Community response and control measures during epidemics.

UNIT-III

16 Hours

Culture and Health

- Concept and definition of culture.
- Elements of culture:
 - Beliefs
 - Norms
 - Traditions
 - Customs
 - Taboos
 - Superstitions
 - Religious practices
 - Social boundaries
- Relationship between culture, health, illness, and health behavior.

Cultural Practices and Health

- Personal hygiene practices.
- Food selection, preparation, and storage.
- Food and sexual taboos.
- Cultural influences on disease prevention, treatment, and patient care.

Community Diagnosis

- Concept and importance of community diagnosis.
- Steps in community diagnosis:
 - Preparation of tools and work plans
 - Selection of techniques
 - Pre-testing of instruments
 - Rapport building
 - Data collection
 - Data processing and analysis
 - Interpretation of findings
 - Community presentation
 - Planning and implementation of Managed Health Projects (MHP)
 - Evaluation

Components of Community Diagnosis

- Demographic characteristics.
- Social, economic, and geographical characteristics.
- Environmental health and sanitation.
- Knowledge, Attitude, and Practice (KAP) studies.
- Maternal and child health indicators.
- Morbidity, disability, and health status assessment.
- Availability and utilization of health services.
- Community resources, leadership, culture, and traditions.

UNIT-IV

15 Hours

Health Needs Assessment

- Concept and importance of health needs assessment.
- Types of health needs:
 - Felt health needs
 - Observed health needs
 - Real health needs
- Principles and methods of needs assessment.

Micro Health Projects (MHP)

- Introduction to micro health projects.
- Steps in micro health project development:
 - Planning
 - Implementation
 - Monitoring
 - Evaluation

Community Presentation and Participation

- Objectives of community presentation:
 - Informing the community
 - Motivating community action
 - Promoting participation
 - Facilitating decision-making
- Steps involved in community presentation.

Community-Based Health Interventions

- Nutritional interventions.
- Immunization services.
- Safe motherhood initiatives.
- Community mobilization strategies.

- Female Community Health Volunteers (FCHVs) and Mothers' Groups.
- Primary Health Care Outreach Clinics.
- Free Drug Programmes (FDP).
- Mobilization of local health leaders and health committees.
- Decentralized management of health services and local governance.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Kumar R, Gupta MC, Kanitkar M. Public Health and Community Medicine. 2nd ed. New Delhi: CBS Publishers & Distributors; 2018.*
- *World Health Organization. Communicable Disease Control Handbook. Geneva: World Health Organization; 2018.*
- *Green LW, Kreuter MW. Health Program Planning: An Educational and Ecological Approach. 5th ed. New York: McGraw-Hill Education; 2015.*
- *Stanhope M, Lancaster J. Public Health Nursing: Population-Centered Health Care in the Community. 11th ed. St. Louis: Elsevier; 2021.*
- *Sharma RK, Ghai OP. Community Medicine. New Delhi: CBS Publishers & Distributors; 2020.*

Course Title: General Medicine I	L	T	P	Cr.
Course Code: DHA402	3	0	0	3

Total Hours 45 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Demonstrate knowledge of clinical methods used in patient assessment, including history taking and physical examination.
2. Perform general and systemic clinical examinations using standard medical procedures.
3. Identify the signs, symptoms, and clinical features of common hematological, cardiovascular, respiratory, gastrointestinal, endocrine, hepatic, and neurological disorders.
4. Explain the etiology, clinical presentation, diagnosis, and basic management of common systemic diseases.
5. Conduct pediatric examinations and recognize common neonatal and childhood disorders.
6. Describe the epidemiology, prevention, and management of major childhood infectious diseases.
7. Discuss common nutritional, dermatological, parasitic, and neonatal health problems affecting children.
8. Apply the principles of Integrated Management of Childhood Illness (IMCI) and infection prevention in child healthcare settings.

COURSE CONTENTS**UNIT-I****11 Hours****Introduction to Clinical Medicine**

- Importance of clinical methods in patient care.
- Principles of patient-centered clinical assessment.

History Taking

- Components of medical history.
- Presenting complaints and history of present illness.
- Past medical, surgical, family, and personal history.
- Drug history and allergy assessment.
- Documentation and interpretation of clinical findings.

Physical Examination

- General physical examination:
 - Vital signs

- Anthropometric measurements
- General appearance and nutritional status
- Systematic examination techniques:
 - Inspection
 - Palpation
 - Percussion
 - Auscultation

Systemic Examination

- Cardiovascular system examination.
- Respiratory system examination.
- Gastrointestinal system examination.
- Nervous system examination.
- Musculoskeletal system examination.
- Bedside clinical examination and interpretation of findings.

UNIT-II

10 Hours

Hematological Disorders

- Introduction to hematological diseases.
- Anemia and its common types.
- Bleeding and clotting disorders.
- Leukemias and common blood disorders.

Cardiovascular Disorders

- Hypertension.
- Ischemic heart disease.
- Congestive heart failure.
- Common cardiac arrhythmias.

Respiratory Disorders

- Bronchial asthma.
- Chronic obstructive pulmonary disease (COPD).
- Pneumonia.
- Tuberculosis.

Gastrointestinal and Hepatic Disorders

- Peptic ulcer disease.
- Gastroenteritis.
- Inflammatory bowel diseases.

- Hepatitis and chronic liver diseases.

Endocrine and Neurological Disorders

- Diabetes mellitus.
- Thyroid disorders.
- Common disorders of the central nervous system.
- Stroke and seizure disorders.

UNIT-III

12 Hours

Pediatric Assessment

- Growth and development in children.
- Pediatric history taking.
- Physical examination of infants and children.
- Assessment of developmental milestones.

Neonatal Conditions and Disorders

- Normal newborn assessment.
- Common neonatal problems.
- Neonatal jaundice.
- Birth injuries and neonatal infections.

Systemic Disorders in Children

- Respiratory disorders.
- Gastrointestinal disorders.
- Cardiovascular disorders.
- Hematological disorders.

Childhood Infectious Diseases

- Mumps.
- Diphtheria.
- Pertussis (Whooping Cough).
- Rheumatic fever.
- Poliomyelitis.
- Prevention and control of childhood infections.

UNIT-IV**12 Hours****Neonatology**

- Principles of neonatal care.
- Essential newborn care.
- Common neonatal emergencies.
- Monitoring and follow-up of neonates.

Skin Disorders and Parasitic Infestations

- Common skin disorders in children.
- Helminthic infestations and their prevention.
- Diagnosis and management of common parasitic diseases.

Nutritional Disorders

- Protein-energy malnutrition.
- Vitamin deficiency disorders.
- Micronutrient deficiencies.
- Nutritional assessment and interventions.

Integrated Child Health Care

- Integrated Management of Childhood Illness (IMCI):
 - Principles and components
 - Assessment and classification of illnesses
 - Management strategies
- Infection prevention and control measures in pediatric and neonatal care settings.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Kumar P, Clark M. Kumar and Clark's Clinical Medicine. 11th ed. Edinburgh: Elsevier; 2024.*
- *Davidson S. Davidson's Principles and Practice of Medicine. 25th ed. Edinburgh: Elsevier; 2023.*

- *Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J. Harrison's Principles of Internal Medicine. 22nd ed. New York: McGraw-Hill Education; 2024.*
- *Parthasarathy A, Menon PSN, Nair MKC. IAP Textbook of Pediatrics. 8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Ghai OP, Paul VK, Bagga A. Ghai Essential Pediatrics. 10th ed. New Delhi: CBS Publishers & Distributors; 2023.*

Course Title: General Surgery I	L	T	P	Cr.
Course Code: DHA403	2	1	0	3

Total Hours 45 hrs**Course Outcomes:** At the end of the course students will be able to...

1. Explain the fundamental principles of surgery, including wound healing, infection control, and sterilization techniques.
2. Identify the causes, clinical features, and basic management of common surgical conditions and emergencies.
3. Demonstrate knowledge of hemorrhage control, shock management, and first aid procedures in emergency situations.
4. Recognize and provide initial management for injuries, burns, fractures, poisoning, and other trauma-related conditions.
5. Describe the anatomy and physiology of the male and female reproductive systems.
6. Explain the physiological processes of menstruation, conception, pregnancy, and normal labor.
7. Identify common obstetric and gynecological disorders and outline their management and referral requirements.
8. Discuss family planning methods, safe motherhood practices, and maternal healthcare services.

COURSE CONTENTS**UNIT-I****12 Hours****Introduction to Basic Surgery**

Principles and scope of surgery.

Surgical asepsis and infection control.

Surgical Conditions

- Hemorrhage: types, causes, clinical features, and management.
- Inflammation: causes, stages, and management.
- Septicemia and toxemia.
- Sinus and fistula.
- Gangrene: types, causes, and treatment principles.
- Wounds:
 - Classification of wounds
 - Wound healing process
 - Principles of wound management
- Tetanus: prevention and management.

- Acute abdomen: causes and clinical approach.
- Hernia: types, presentation, and management.
- Anal fissure and hemorrhoids (piles).

Urological Surgical Conditions

- Acute retention of urine.
- Causes of frequent urination and nocturia.
- Rupture of urethra.
- Hematuria.
- Phimosis and paraphimosis.
- Hydrocele.

Orthopedic and Neurosurgical Conditions

- Head injury: assessment and emergency management.
- Osteomyelitis: clinical features, diagnosis, and management.

Surgical Procedures

- Principles of local anesthesia.
- Sterilization and disinfection of surgical instruments.

UNIT-II

11 Hours

Emergency Management

- Principles of first aid.
- Emergency assessment and patient stabilization.

Shock and Hemorrhage

- Types and causes of shock.
- Recognition and management of shock.
- Control of hemorrhage and external bleeding.

Trauma and Injury Management

- Soft tissue injuries.
- Fractures and dislocations.
- Principles of immobilization and transportation.

Burns and Environmental Injuries

- Thermal burns.
- Chemical burns.

- Frostbite and cold injuries.
- Initial management of burn patients.

Poisoning and Other Emergencies

- Common types of poisoning and emergency care.
- Animal bites and their management.
- Drowning and resuscitation measures.

Surgical Infections

- Abscess: causes, signs, and treatment.
- Cellulitis: clinical features and management.

UNIT-III

10 Hours

Reproductive System

- Anatomy and physiology of the male reproductive system.
- Anatomy and physiology of the female reproductive system.

Reproductive Physiology

- Menstrual cycle and mechanism of menstruation.
- Fertilization and conception.
- Embryonic and fetal development.

Common Obstetric and Gynecological Conditions

- Vaginal discharge: causes and management.
- Per vaginal bleeding: causes, assessment, and management.
- Postmenopausal bleeding.
- Uterine prolapse.

Pelvic Inflammatory Disease

- Etiology and risk factors.
- Clinical manifestations.
- Diagnosis, treatment, and prevention.

UNIT-IV

12 Hours

Gynecological Disorders

- Ectopic pregnancy:

- Causes
- Clinical features
- Complications and management
- Mastitis and breast abscess:
 - Etiology
 - Clinical features
 - Management

Pregnancy and Labor

- Antenatal care and safe motherhood practices.
- Normal labor:
 - Stages and management
 - Monitoring of labor progress
- Early identification of high-risk and complicated pregnancies.
- Referral of obstetric emergencies.

Postnatal Care

- Puerperium and postnatal care.
- Common complications during the puerperium.

Family Planning

- Principles of family planning.
- Temporary contraceptive methods:
 - Barrier methods
 - Hormonal contraceptives
 - Intrauterine devices
- Permanent contraceptive methods:
 - Vasectomy
 - Tubectomy
- Safe abortion practices and legal considerations.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Dutta DC. Textbook of Obstetrics. 10th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Dutta DC. Textbook of Gynecology. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Cunningham FG, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM. Williams Obstetrics. 27th ed. New York: McGraw-Hill Education; 2025.*
- *Shaw RW, Luesley DM, Monga A. Gynaecology. 5th ed. Edinburgh: Elsevier; 2022.*
- *World Health Organization. Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors. 3rd ed. Geneva: World Health Organization; 2024.*

Course Title: Pharmacology and Pharmacy II	L	T	P	Cr.
Course Code: DHA404	2	1	0	3

Total Hours 45 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the pharmacological principles, mechanisms of action, indications, contraindications, and adverse effects of commonly used anesthetic agents.
2. Differentiate between intravenous induction agents, inhalational anesthetics, muscle relaxants, and reversal drugs used in clinical practice.
3. Describe the classification, administration routes, and clinical applications of local anesthetic agents.
4. Demonstrate knowledge of emergency medications used in resuscitation, cardiovascular emergencies, and critical care settings.
5. Explain the dosage, dilution, administration, and monitoring requirements of commonly used emergency drugs.
6. Discuss the pharmacology and therapeutic applications of cardiovascular, respiratory, renal, and anti-allergic medications.
7. Recognize adverse drug reactions, drug interactions, and safety precautions associated with commonly used medications.
8. Apply principles of rational drug use and safe medication practices in healthcare settings.

COURSE CONTENTS

UNIT-I

10 Hours

Intravenous Induction Agents

- Introduction to general anesthesia.
- Characteristics of an ideal induction agent.
- Pharmacology of:
 - Thiopentone Sodium
 - Diazepam
 - Midazolam
 - Ketamine
 - Propofol
 - Etomidate
- Indications, contraindications, adverse effects, and clinical applications.

Muscle Relaxants

- Classification of muscle relaxants.
- Depolarizing muscle relaxants:
 - Suxamethonium (Succinylcholine)
- Non-depolarizing muscle relaxants:
 - Vecuronium
 - Atracurium
 - Rocuronium
- Mechanism of action, uses, and complications.

Inhalational Anesthetic Agents

- Medical gases:
 - Oxygen (O₂)
 - Nitrous Oxide (N₂O)
 - Medical Air
- Volatile anesthetic agents:
 - Ether
 - Halothane
 - Isoflurane
 - Sevoflurane
 - Desflurane
- Pharmacological properties and clinical applications.

Reversal Agents

- Neostigmine
- Glycopyrrolate
- Atropine
- Naloxone
- Flumazenil
- Indications, dosage principles, and precautions.

UNIT-II

11 Hours

Introduction to Local Anesthesia

- Definition and principles of local anesthesia.
- Mechanism of action of local anesthetics.
- Factors affecting the efficacy of local anesthetics.

Commonly Used Local Anesthetics

- Lidocaine (Xylocaine)
- Bupivacaine

- Prilocaine
- Etidocaine
- Ropivacaine

Topical and Surface Anesthetics

- Prilocaine Jelly
- EMLA Cream/Ointment
- Topical anesthetic preparations

Clinical Applications

- Local infiltration anesthesia.
- Field block anesthesia.
- Regional anesthesia.
- Spinal and epidural anesthesia.
- Adverse effects and toxicity management.

UNIT-III

11 Hours

Principles of Emergency Drug Administration

- Routes of drug administration in emergencies.
- Drug dilution and dosage calculations.
- Monitoring and safety during drug administration.

Resuscitation and Emergency Drugs

- Adrenaline (Epinephrine)
- Atropine
- Ephedrine
- Mephentermine

Electrolytes and Acid-Base Corrective Agents

- Sodium Bicarbonate
- Calcium Preparations
- Potassium Preparations
- Indications, administration, and precautions.

Inotropic and Antiarrhythmic Agents

- Dopamine
- Dobutamine
- Amiodarone

- Mechanism of action, indications, and monitoring.

UNIT-IV

13 Hours

Respiratory System Drugs

- Aminophylline
- Bronchodilators:
 - Classification
 - Mechanism of action
 - Clinical uses

Anti-inflammatory and Anti-allergic Drugs

- Hydrocortisone
- Antihistamines
- Indications, adverse effects, and precautions.

Cardiovascular Drugs

- Antihypertensive Agents
 - Beta-Blockers
 - Calcium Channel Blockers
 - Therapeutic uses and monitoring.
- Antiarrhythmic Agents
 - Lidocaine (Xylocard)
 - Clinical applications in arrhythmia management.
- Vasodilators
 - Nitroglycerin
 - Sodium Nitroprusside
 - Indications and precautions.

Renal System Drugs

- Diuretics
 - Furosemide (Frusemide)
 - Mannitol
 - Classification, mechanism of action, indications, and adverse effects.

Drug Safety

- Adverse drug reactions.
- Drug interactions.
- Medication safety and rational drug use in healthcare practice.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Whalen K. *Lippincott Illustrated Reviews: Pharmacology*. 9th ed. Philadelphia: Wolters Kluwer; 2025.
- Stoelting RK, Hillier SC. *Pharmacology and Physiology in Anesthetic Practice*. 6th ed. Philadelphia: Wolters Kluwer; 2021.
- Butterworth JF, Mackey DC, Wasnick JD. *Morgan and Mikhail's Clinical Anesthesiology*. 7th ed. New York: McGraw-Hill Education; 2022.
- Wyllie R, Hyams JS, Kay M. *Pediatric Gastrointestinal and Liver Disease*. 7th ed. Philadelphia: Elsevier; 2025.
- World Health Organization. *WHO Model Formulary*. Geneva: World Health Organization; 2023.

Course Title: Basics Medical Procedure and First Aid	L	T	P	Cr.
Course Code: DHA405	2	1	0	3

Total Hours 45 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate professionalism, ethical conduct, and legal responsibilities in healthcare practice.
2. Perform assessment of patients through history taking, physical examination, and measurement of vital signs.
3. Apply clinical examination techniques including inspection, palpation, percussion, and auscultation.
4. Administer medications safely through various routes while adhering to standard medication administration guidelines.
5. Implement principles of medical and surgical asepsis, infection prevention, and sterilization practices.
6. Assess and manage common emergencies using appropriate first aid procedures and triage principles.
7. Provide first aid for wounds, burns, fractures, bites, poisoning, and environmental emergencies.
8. Demonstrate knowledge of cardiopulmonary resuscitation (CPR), choking management, and emergency care for unconscious patients.

COURSE CONTENTS

UNIT-I

11 Hours

Professionalism in Healthcare

- Concept and importance of professionalism.
- Legal, ethical, and moral responsibilities of healthcare workers.
- Code of conduct and professional behavior in healthcare settings.
- Patient rights, confidentiality, and informed consent.

Assessment of Vital Signs

- Principles and significance of vital signs monitoring.
- Techniques for:
 - Palpation of peripheral and central pulses
 - Measurement of respiratory rate
 - Measurement of body temperature at various sites
 - Blood pressure measurement
- Recording and interpretation of vital signs.
- Care and maintenance of vital signs equipment.

Patient History Taking

- Collection of subjective and objective patient data.
- Components of health history:
 - General appearance
 - Chief complaint
 - History of present illness
 - Past medical history
 - Family history
 - Personal and social history
 - Developmental history
 - Dietary history
 - Drug history
 - Menstrual history
 - Immunization history

Physical Examination

- Principles of patient examination.
- Inspection techniques.
- Palpation of the chest and abdomen.
- Documentation of clinical findings.

UNIT-II

12 Hours

Advanced Physical Examination

- Percussion of the chest and abdomen.
- Techniques of auscultation.
- Assessment of:
 - Jaundice
 - Anemia
 - Lymph node enlargement
 - Cyanosis
 - Clubbing
 - Edema

Medication Administration

- Principles of safe medication administration.
- Drug absorption and factors affecting drug action.
- Advantages and disadvantages of different routes of drug administration.

Routes of Drug Administration

- Oral administration.
- Rectal administration.
- Vaginal administration.
- Topical administration.
- Ophthalmic (eye) administration.
- Otic (ear) administration.
- Introduction to parenteral routes and associated precautions.
- Risks of intravenous medication administration.

Asepsis and Infection Prevention

- Definitions of sterile, aseptic, and non-sterile procedures.
- Principles of medical and surgical asepsis.
- Hand hygiene and sanitation procedures.
- Handling and maintenance of sterile and aseptic equipment.
- Prevention of healthcare-associated infections.

UNIT-III

12 Hours

Fundamentals of First Aid

- Purpose and objectives of first aid.
- Essential principles of first aid.
- Assessment and intervention during emergencies.
- Communication and referral responsibilities.
- Principles of triage during mass casualty incidents.

Environmental Emergencies

- Dehydration:
 - Mild, moderate, and severe dehydration
- Heat-related illnesses.
- Altitude sickness.
- Hypothermia.
- Frostbite.
- Use of Oral Rehydration Salts (ORS) and other supportive treatments.
- Identification of cases requiring urgent referral.

Management of Injuries

- Terminology related to injuries.
- Types of wounds:

- Abrasions
- Contusions
- Lacerations
- Puncture wounds
- Burns
- Principles of wound care and dressing.
- Techniques of bandaging.
- Control of hemorrhage and bleeding.
- First aid management of burns.

UNIT-IV

08 Hours

Bites, Stings, and Poisoning

- Snake bites:
 - Types of snake venom (Neurotoxic and Hemotoxic)
 - Clinical manifestations
 - Diagnosis and emergency management
- Animal bites:
 - Rabies transmission and prevention
 - Management of suspected rabid animal bites
- Insect stings and poisoning emergencies.

Respiratory Emergencies

- Causes of breathlessness:
 - Asthma
 - Pulmonary embolism
 - Pneumothorax
 - Pulmonary edema
 - Heart failure
 - Chronic obstructive pulmonary disease (COPD)
 - Hysteria and anxiety-related conditions
 - Uremia
- Emergency assessment and initial management.

Assessment of Consciousness

- Definitions:
 - Consciousness
 - Drowsiness
 - Stupor
 - Coma

- Principles of neurological assessment.

Management of Unconsciousness

- Common causes:
 - Asphyxia
 - Head injury
 - Shock
 - Syncope (fainting)
 - Stroke
 - Poisoning
 - Myocardial infarction
 - Convulsions
 - Diabetic emergencies
 - Psychogenic disorders
- Emergency management and referral.

Cardiopulmonary Resuscitation and Choking Management

- Principles and steps of Cardiopulmonary Resuscitation (CPR).
- Basic Life Support (BLS) concepts.
- Airway management.
- Choking:
 - Recognition of airway obstruction
 - Heimlich maneuver
 - Modifications for infants, children, pregnant women, and special situations.
- Post-resuscitation care and referral.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Bickley LS. Bates' Guide to Physical Examination and History Taking. 14th ed. Philadelphia: Wolters Kluwer; 2025.*
- *Douglas G, Nicol F, Robertson C. Macleod's Clinical Examination. 15th ed. Edinburgh: Elsevier; 2024.*
- *Hutchison R. Hutchison's Clinical Methods. 25th ed. Edinburgh: Elsevier;*

2023.

- *American Heart Association. Basic Life Support (BLS) Provider Manual. Dallas: American Heart Association; 2025.*
- *American Academy of Orthopaedic Surgeons. First Aid, CPR and AED. 8th ed. Burlington: Jones & Bartlett Learning; 2023.*

Course Title: General Medicine I (Practical)	L	T	P	Cr.
Course Code: DHA406	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate the correct procedure for recording a standard electrocardiogram (ECG/EKG).
2. Identify normal ECG waveforms, intervals, and common cardiac abnormalities through ECG interpretation.
3. Analyze chest radiographs and recognize common normal and pathological findings.
4. Perform and assist in Treadmill Test (TMT) procedures while monitoring patient safety.
5. Interpret basic TMT findings and recognize significant exercise-induced cardiac changes.
6. Demonstrate the use of ambulatory ECG (Holter) monitoring systems and interpret common monitoring results.
7. Apply the principles and techniques of Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS).
8. Perform cardiopulmonary resuscitation (CPR) effectively in simulated emergency situations following current guidelines.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Electrocardiography (ECG/EKG)

- Identification of ECG machine components and accessories.
- Preparation of patient for ECG recording.
- Electrode placement and lead positioning.
- Recording a standard 12-lead ECG.
- Recognition of normal ECG waves, intervals, and segments.
- Interpretation of common ECG abnormalities:
 - Bradycardia
 - Tachycardia
 - Arrhythmias
 - Myocardial ischemia and infarction
- Documentation and reporting of ECG findings.

Chest X-Ray Interpretation

- Identification of anatomical landmarks on chest radiographs.
- Assessment of image quality and positioning.

- Interpretation of normal chest X-ray findings.
- Recognition of common abnormalities:
 - Cardiomegaly
 - Pneumonia
 - Pleural effusion
 - Pneumothorax
 - Pulmonary tuberculosis
 - Pulmonary edema
- Correlation of radiographic findings with clinical conditions.

Treadmill Test (TMT)

- Introduction to exercise stress testing.
- Indications and contraindications of TMT.
- Patient preparation and safety precautions.
- Monitoring of vital signs during exercise testing.
- Observation of ECG changes during exercise.
- Recognition of normal and abnormal stress test findings.
- Documentation and interpretation of TMT results.

Ambulatory ECG (Holter) Monitoring

- Principles of ambulatory ECG monitoring.
- Components and operation of Holter monitoring systems.
- Patient preparation and electrode placement.
- Recording and retrieval of ambulatory ECG data.
- Identification of common rhythm abnormalities.
- Interpretation and reporting of Holter monitoring findings.

Cardiopulmonary Resuscitation (CPR), BLS and ACLS

- Assessment of emergency situations and patient responsiveness.
- Airway, breathing, and circulation (ABC) assessment.
- Adult, child, and infant CPR techniques.
- Use of Automated External Defibrillator (AED).
- Basic Life Support (BLS) protocols.
- Introduction to Advanced Cardiovascular Life Support (ACLS).
- Airway management techniques.
- Management of cardiac arrest and emergency cardiac rhythms.
- Team-based resuscitation skills and simulation exercises.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Hampton JR. The ECG Made Easy. 10th ed. Edinburgh: Elsevier; 2024.*
- *Goldberger AL. Goldberger's Clinical Electrocardiography: A Simplified Approach. 10th ed. Philadelphia: Elsevier; 2023.*
- *Wagner GS, Strauss DG. Marriott's Practical Electrocardiography. 14th ed. Philadelphia: Wolters Kluwer; 2024.*
- *Felson B, Reeder MM. Felson's Principles of Chest Roentgenology: A Programmed Text. 5th ed. Philadelphia: Elsevier; 2020.*
- *Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J. Harrison's Principles of Internal Medicine. 22nd ed. New York: McGraw-Hill Education; 2024*

Course Title: General Surgery I (Practical)	L	T	P	Cr.
Course Code: DHA407	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Describe the organization, layout, and functional areas of an Operation Theatre (OT).
2. Demonstrate knowledge of operating theatre protocols, infection control measures, and maintenance of aseptic conditions.
3. Perform proper surgical hand scrubbing, gowning, and gloving techniques according to standard guidelines.
4. Identify and handle commonly used surgical instruments and operation theatre equipment.
5. Explain the principles and methods of sterilization and disinfection of surgical instruments and supplies.
6. Assist in patient preparation, transportation, positioning, and preoperative care for surgical procedures.
7. Demonstrate familiarity with laparoscopic instruments and equipment used in minimally invasive surgery.
8. Assist in basic surgical procedures and acquire fundamental operative skills under supervision while adhering to patient safety and ethical standards.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Operation Theatre Organization and Layout

- Observation of the general layout and design of the operation theatre complex.
- Identification of sterile, semi-sterile, and non-sterile zones.
- Understanding workflow within the operating theatre.
- Roles and responsibilities of OT personnel.

Operation Theatre Management and Aseptic Practices

- Maintenance of operation theatre discipline and protocols.
- Infection prevention and control measures in OT.
- Biomedical waste segregation and disposal.
- Maintenance of sterile environment and patient safety standards.

Surgical Hand Preparation and Sterilization Procedures

- Surgical hand scrubbing techniques.
- Gowning and gloving procedures.
- Preparation of sterile surgical fields.
- Principles and methods of sterilization:
 - Autoclaving
 - Chemical sterilization
 - Dry heat sterilization
 - High-level disinfection
- Care, handling, and storage of sterile instruments.

Identification and Handling of Surgical Instruments and Equipment

- Identification and uses of common surgical instruments:
 - Cutting instruments
 - Grasping instruments
 - Retractors
 - Hemostatic instruments
 - Suturing instruments
- Operation and safety precautions of OT equipment:
 - Electrocautery unit
 - Suction apparatus
 - Surgical lights
 - Patient monitoring devices
- Routine maintenance and troubleshooting of equipment.

Laparoscopic Equipment and Preoperative Patient Care

- Components of laparoscopic surgical systems.
- Handling and care of laparoscopic instruments.
- Preparation of laparoscopic equipment before surgery.
- Preoperative assessment and preparation of surgical patients.
- Safe transfer and positioning of patients in the operation theatre.
- Documentation and checklist procedures before surgery.

Basic Surgical Skills and Operative Assistance

- Principles of tissue handling and instrument handling.
- Basic suturing and knot-tying techniques using simulation models.
- Wound dressing and postoperative care.
- Observation and assistance in common minor and intermediate surgical procedures.
- Familiarization with procedures such as:
 - Suprapubic cystostomy / cystectomy (as per institutional practice)
 - Urethral dilatation

- Cystolithotomy
- Varicocele surgery
- Adherence to surgical safety protocols and ethical considerations during operative procedures.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Fuller JR. Surgical Technology: Principles and Practice. 8th ed. St. Louis: Elsevier; 2021.*
- *Rothrock JC. Alexander's Care of the Patient in Surgery. 17th ed. St. Louis: Elsevier; 2023.*
- *Phillips N. Berry & Kohn's Operating Room Technique. 15th ed. St. Louis: Elsevier; 2022.*
- *Fischer JE, Bland KI. Mastery of Surgery. 8th ed. Philadelphia: Wolters Kluwer; 2023.*
- *World Health Organization. WHO Surgical Safety Checklist and Implementation Manual. Geneva: World Health Organization; 2021.*

5TH SEMESTER

Course Title: General Surgery II	L	T	P	Cr.
Course Code: DHA501	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Describe the anatomy, physiology, and common disorders of the reproductive system and explain the principles of maternal and reproductive healthcare.
2. Identify the clinical manifestations, investigations, and management strategies of common gastrointestinal, hepatobiliary, and genitourinary surgical disorders.
3. Perform basic assessment of ophthalmic conditions and recognize eye diseases requiring immediate management or referral.
4. Explain the etiology, clinical features, prevention, and treatment of common ENT disorders and oral health conditions.
5. Demonstrate appropriate decision-making skills in the early recognition, referral, and supportive management of surgical and emergency conditions encountered in healthcare settings.
6. Apply principles of patient education, preventive healthcare, and infection control in the management of reproductive, ophthalmic, ENT, and oral health disorders

COURSE CONTENTS

UNIT-I

14 Hours

- Anatomy and physiology of the male and female reproductive systems.
- Physiology and mechanism of menstruation.
- Fertilization, conception, embryonic and fetal development.
- Common causes and management of vaginal discharge.
- Assessment and management of per-vaginal bleeding.
- Post-menstrual and reproductive health concerns.
- Uterine prolapse: causes, clinical features, and management.
- Pelvic inflammatory disease: etiology, clinical manifestations, complications, and treatment.
- Ectopic pregnancy: signs, symptoms, complications, and referral.
- Mastitis and breast abscess: diagnosis and management.
- Principles of normal labor and delivery.

- Early identification and referral of complications during pregnancy, labor, and puerperium.
- Safe abortion practices and legal aspects.
- Family planning methods: temporary and permanent contraceptive techniques.

UNIT-II

15 Hours

- Surgical anatomy and physiology of the gallbladder and biliary tract.
- Benign and malignant disorders of the gallbladder and bile ducts: clinical features, investigations, and treatment.
- Surgical disorders of the pancreas.
- Anatomy and clinical significance of the peritoneum, omentum, mesentery, and retroperitoneal space.
- Disorders of the small and large intestines.
- Intestinal obstruction: causes, clinical presentation, diagnosis, and management.
- Acute appendicitis: clinical features, complications, and treatment.
- Disorders of the rectum, anus, and anal canal.
- Hernias, umbilical disorders, and abdominal wall defects.
- Genitourinary system: urinary symptoms and diagnostic investigations.
- Anuria and urinary tract disorders.
- Diseases of the kidneys, ureters, urinary bladder, prostate, seminal vesicles, urethra, penis, testes, and scrotum.

UNIT-III

16 Hours

- General examination procedures of the eye.
- Assessment and basic examination of eye disorders.
- Disorders of the eyelids: signs, symptoms, and management.
- Evaluation and management of red eye conditions.
- Trachoma: etiology, clinical features, prevention, and treatment.
- Corneal ulcer: causes, manifestations, complications, and management.
- Night blindness: causes, prevention, and treatment.
- Cataract: clinical features, diagnosis, and management.
- Pterygium: causes, presentation, and treatment.
- Iridocyclitis: clinical features and management.
- Exophthalmos: causes and clinical significance.
- Glaucoma: types, symptoms, diagnosis, and referral.

- Management of foreign bodies in the eye.
- Removal of ear wax and foreign bodies from accessible sites.

UNIT-IV

15 Hours

- Otitis media and otitis externa: etiology, clinical features, management, and referral.
- Hearing disorders: identification and referral indications.
- Deviated nasal septum: clinical features and management.
- Nasal polyps: causes, symptoms, and treatment.
- Epistaxis: causes, first aid, and management.
- Sinusitis: types, clinical presentation, complications, and treatment.
- Acute tonsillitis: clinical features, complications, and management.
- Pharyngitis and laryngitis: diagnosis and treatment principles.
- Dental plaque and calculus: formation and prevention.
- Dental caries: etiology, progression, and preventive measures.
- Periodontitis, periodontal pockets, and dental abscesses.
- Importance of oral hygiene and methods for maintaining oral health.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Das S. A Concise Textbook of Surgery. 11th ed. Kolkata: Dr. S. Das Publications; 2023.*
- *Norman SW, O'Connell PR, McCaskie AW. Bailey & Love's Short Practice of Surgery. 29th ed. Boca Raton: CRC Press; 2024.*
- *Dutta DC. Textbook of Gynecology. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Konar H. DC Dutta's Textbook of Obstetrics. 10th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Khurana AK. Comprehensive Ophthalmology. 8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2024.*

Course Title: General Medicine II	L	T	P	Cr.
Course Code: DHA502	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the etiology, pathophysiology, clinical manifestations, diagnostic procedures, and management of common respiratory diseases.
2. Identify and describe common dermatological, infectious, and tropical diseases, including their prevention and treatment strategies.
3. Assess cardiovascular symptoms and explain the diagnosis, management, and prevention of major cardiovascular disorders.
4. Demonstrate knowledge of psychiatric disorders, mental health assessment, and the principles of psychological and psychiatric care.
5. Interpret common clinical findings and diagnostic investigations related to respiratory, cardiovascular, dermatological, and psychiatric conditions.
6. Apply preventive, therapeutic, and referral principles in the management of patients with medical disorders encountered in primary and secondary healthcare settings.

COURSE CONTENTS

UNIT-I

16 Hours

- Clinical approach to respiratory symptoms: cough, hemoptysis, breathlessness, hypoxia, and cyanosis.
- Disorders of the upper respiratory tract, tonsils, and adenoids.
- Obstructive sleep apnea: etiology, clinical features, diagnosis, and management.
- Pneumonia: classification, clinical manifestations, investigations, and treatment.
- Suppurative lung diseases and lung abscess.
- Chronic Obstructive Pulmonary Disease (COPD) and emphysema.
- Bronchial asthma: pathophysiology, diagnosis, and management.
- Bronchiectasis: causes, clinical features, and treatment.
- Pleural diseases: pleural effusion and pneumothorax.
- Mediastinal masses and their clinical significance.
- Carcinoma of the lung: risk factors, diagnosis, and management principles.
- Diagnostic procedures in respiratory medicine:
 - Chest radiography (X-ray)

- Computed Tomography (CT) of the chest
- Bronchoscopy
- Pulmonary function tests and spirometry

UNIT-II

14 Hours

- Introduction to dermatology and basic dermatological examination.
- Bacterial infections of the skin: causes, clinical features, and management.
- Fungal skin infections and their treatment.
- Viral skin infections and preventive measures.
- Parasitic infestations of the skin.
- Allergic and hypersensitivity disorders affecting the skin.
- Acne vulgaris: etiology, clinical presentation, and management.
- Psoriasis: pathogenesis, clinical features, and treatment.
- Vitiligo: causes, diagnosis, and management.
- Malaria: epidemiology, clinical manifestations, diagnosis, treatment, and prevention.

UNIT-III

15 Hours

- Clinical approach to cardiovascular symptoms:
 - Dyspnea and pulmonary edema
 - Heart murmurs
 - Hypertension
 - Chest discomfort and pain
 - Palpitations
 - Edema
 - Syncope
- Atherosclerosis and ischemic heart disease.
- Angina pectoris and myocardial infarction.
- Coronary revascularization procedures.
- Heart failure: causes, classification, diagnosis, and management.
- Congenital heart diseases:
 - Cyanotic heart diseases
 - Acyanotic heart diseases
- Rheumatic fever and rheumatic heart disease.
- Infective endocarditis.
- Cardiac arrhythmias: bradyarrhythmias and tachyarrhythmias.
- Diseases of the myocardium:

- Cardiomyopathy
- Myocarditis
- Diseases of the pericardium.
- Systemic hypertension and hypertensive heart disease.
- Diseases of the aorta.
- Cor pulmonale.
- Pulmonary embolism and pulmonary hypertension.

UNIT-IV

15 Hours

- Introduction to mental health services and psychiatric care.
- Principles of psychiatric assessment and mental status examination.
- Etiology and risk factors of mental illness.
- Psychotic disorders: clinical features and management principles.
- Neurotic disorders and anxiety disorders.
- Depressive disorders: diagnosis and treatment approaches.
- Bipolar affective disorder.
- Alcohol and substance abuse disorders.
- Childhood and adolescent psychiatric disorders.
- Psychosexual disorders.
- Psychological trauma and stress-related disorders.
- Epilepsy: overview, clinical features, and management.
- Intellectual disability (mental retardation): causes, assessment, and rehabilitation.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Khurana I. Textbook of Medical Physiology. 4th ed. New Delhi: Elsevier; 2023.*
- *Kaplan HI, Sadock BJ, Grebb JA. Kaplan and Sadock's Synopsis of Psychiatry. 13th ed. Philadelphia: Wolters Kluwer; 2024.*
- *Ahuja N. A Short Textbook of Psychiatry. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*

- *Park K. Park's Textbook of Preventive and Social Medicine. 28th ed. Jabalpur: Banarsidas Bhanot Publishers; 2025.*
- *Mishra AK. Textbook of Medicine for Allied Health Sciences. 2nd ed. New Delhi: CBS Publishers & Distributors; 2023.*

Course Title: Clinical Pathology	L	T	P	Cr.
Course Code: DHA503	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the structure and function of normal cells and tissues and describe the pathological changes occurring during disease processes.
2. Identify common intestinal, blood, and tissue parasites and explain their life cycles, laboratory diagnosis, prevention, and control measures.
3. Demonstrate knowledge of blood composition, hematological investigations, blood collection techniques, and the use of anticoagulants.
4. Describe the principles and procedures involved in blood grouping, donor selection, blood preservation, and transfusion practices.
5. Interpret basic hematological and parasitological laboratory findings and correlate them with clinical conditions.
6. Apply principles of laboratory safety, quality assurance, and ethical practices in clinical pathology and blood banking services.

COURSE CONTENTS

UNIT-I

14 Hours

- Introduction to pathology and its scope in healthcare.
- Normal structure and function of cells and tissues.
- Cellular adaptations and responses to injury.
- Cell injury, degeneration, and cell death.
- Causes of diseases: genetic, infectious, immunological, nutritional, physical, and chemical factors.
- Pathogenesis and mechanisms of disease development.
- Inflammation: acute and chronic inflammation.
- Tissue repair, healing, and regeneration.
- Hemodynamic disorders, edema, thrombosis, and embolism.
- Systemic responses of cells, tissues, and organs to disease processes.

UNIT-II

16 Hours

- Introduction to medical parasitology.
- Classification and life cycles of medically important parasites.
- Intestinal helminths:

- *Ascaris lumbricoides*
- Hookworm
- *Trichuris trichiura*
- *Enterobius vermicularis*
- *Taenia* species
- *Echinococcus* species
- *Hymenolepis nana*
- Intestinal protozoa:
 - *Entamoeba histolytica*
 - *Giardia lamblia*
 - *Trichomonas vaginalis*
- Modes of transmission and infection.
- Pathogenesis and clinical manifestations of parasitic diseases.
- Laboratory diagnosis of intestinal parasites.
- Prevention and control of parasitic infections.
- Blood and tissue parasites: introduction and clinical significance.
- Host defense mechanisms and immunity against parasitic infections.

UNIT-III

15 Hours

- Introduction to hematology.
- Composition and functions of blood.
- Physical and chemical characteristics of blood.
- Blood cells and their functions.
- Anticoagulants: types, principles, and applications.
- Collection, preservation, and handling of blood samples.
- Hematological investigations:
 - Hemoglobin estimation
 - Total and differential leukocyte count
 - Erythrocyte count
 - Platelet count
 - Erythrocyte sedimentation rate (ESR)
 - Packed cell volume (PCV)
- Peripheral blood smear examination.
- Quality control in hematology laboratories.

UNIT-IV

08 Hours

- Introduction to blood banking and transfusion services.
- ABO blood group system and its subgroups.

- Rh blood group system and its clinical significance.
- Blood donor selection and eligibility criteria.
- Preparation and counseling of blood donors.
- Donor history taking and medical examination.
- Blood collection procedures and safety measures.
- Preservation and storage of blood and blood components.
- Anticoagulants used in blood banking.
- Blood component preparation and utilization.
- Cross-matching techniques:
 - Major cross-match
 - Minor cross-match
- Antiglobulin (Coombs) serum: preparation and applications.
- Principles, importance, and interpretation of compatibility testing.
- Adverse reactions and complications of blood transfusion.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- Kumar V, Abbas AK, Aster JC. *Robbins and Cotran Pathologic Basis of Disease*. 11th ed. Philadelphia: Elsevier; 2025.
- Harsh Mohan. *Textbook of Pathology*. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.
- Chatterjea MN, Shinde R. *Textbook of Medical Biochemistry*. 10th ed. New Delhi: Jaypee Brothers Medical Publishers; 2022.
- Turgeon ML. *Clinical Hematology: Theory and Procedures*. 7th ed. Philadelphia: Wolters Kluwer; 2023.
- Hoffbrand AV, Moss PAH. *Essential Haematology*. 9th ed. Hoboken: Wiley-Blackwell; 2024.

Course Title: Primary Health Care / Family Management	L	T	P	Cr.
Course Code: DHA504	3	1	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the principles of epidemiology and apply disease prevention and control measures for common communicable diseases.
2. Assess nutritional status and recommend appropriate dietary interventions for individuals and communities.
3. Conduct community health assessments using appropriate data collection, analysis, and interpretation techniques.
4. Develop community health profiles and participate in planning, implementation, monitoring, and evaluation of health programs.
5. Demonstrate knowledge of health management systems, healthcare delivery structures, and primary healthcare services.
6. Apply principles of health promotion, disaster management, cold chain maintenance, and community-based healthcare delivery.

COURSE CONTENTS

UNIT-I

14 Hours

- Introduction to epidemiology: definition, scope, and applications.
- Concepts of disease causation, transmission, and prevention.
- Epidemiological methods and measures of disease occurrence.
- Principles of outbreak investigation and disease surveillance.
- Disaster preparedness and management.
- Epidemic prevention, control, and management.
- Communicable diseases: etiology, clinical features, prevention, and control of:
 - Gastroenteritis
 - Dysentery
 - Cholera
 - Typhoid fever
 - Giardiasis
 - Malaria
 - Filariasis
 - Japanese encephalitis
 - Kala-azar
 - Dengue fever
 - Parasitic infestations

- Scabies
- Chickenpox
- Influenza
- Mumps
- Rabies
- Viral hepatitis
- Ringworm
- Leprosy
- Tuberculosis
- Helminthic infections
- Pertussis
- Measles
- Diphtheria
- HIV/AIDS
- Sexually transmitted infections (STIs)
- COVID-19
- Strategies for disease prevention and community health promotion.

UNIT-II

15 Hours

- Introduction to nutrition and its importance in health.
- Nutrients and their functions:
 - Proteins
 - Carbohydrates
 - Fats
 - Vitamins
 - Minerals
- Balanced diet and dietary requirements across the lifespan.
- Assessment of nutritional status.
- Malnutrition and undernutrition.
- Nutritional deficiencies and public health nutrition problems.
- Role of nutrition in disease prevention and management.
- Nutrition in selected diseases and special conditions.
- Nutrition education and counseling.
- Food beliefs, taboos, myths, and their impact on health.

UNIT-III

16 Hours

- Concept of community health and community diagnosis.
- Relationship between culture, society, and health.

- Steps in community diagnosis.
- Methods of data collection and community surveys.
- Data processing, analysis, and interpretation.
- Community health profile preparation.
- Presentation of community health findings.
- Development of micro health projects.
- Community health needs assessment.
- Micro-planning of health programs.
- Supervision, monitoring, and evaluation of health programs.
- Health Management Information System (HMIS):
 - Concepts and objectives
 - Data collection and reporting
 - Use of HMIS in health planning and decision-making

UNIT-IV

15 Hours

- Principles of health management and administration.
- Planning, organization, and management of health camps.
- Cold chain management and vaccine storage systems.
- Training management in healthcare and community settings.
- Logistic and supply chain management in healthcare services.
- Structure and functions of healthcare delivery systems:
 - Ministry of Health
 - Directorate/Department of Health Services
 - Provincial and District Health Authorities
 - Primary Health Care Centres (PHCs)
 - Community Health Centres (CHCs)
 - Health Posts and Sub-Centres
 - Basic Health Service Centres
- Organization and management of primary healthcare services.
- Health legislation, ethics, and professional regulatory bodies.
- Roles and responsibilities of healthcare professionals in community health programs

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Mudambi SR, Rajagopal MV. Fundamentals of Foods, Nutrition and Diet Therapy. 7th ed. New Delhi: New Age International Publishers; 2022.*
- *Bamji MS, Krishnaswamy K, Brahmam GNV. Textbook of Human Nutrition. 5th ed. New Delhi: Oxford and IBH Publishing; 2023.*
- *Stanhope M, Lancaster J. Public Health Nursing: Population-Centered Health Care in the Community. 11th ed. St. Louis: Elsevier; 2023.*
- *Sharma RK. Health Management and Health Administration. 3rd ed. New Delhi: CBS Publishers & Distributors; 2022.*
- *World Health Organization. Primary Health Care: Transforming Vision into Action. Geneva: World Health Organization; 2023.*

Course Title: Health Education and Health Management	L	T	P	Cr.
Course Code: DHA505	4	0	0	4

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the principles of nutrition and their role in maintaining health and preventing diseases.
2. Describe the digestion, metabolism, and physiological functions of carbohydrates, proteins, fats, vitamins, minerals, and water.
3. Assess nutritional requirements and develop balanced dietary plans for individuals with different health and activity needs.
4. Evaluate body weight status using BMI and other indicators and explain the causes, consequences, and prevention of obesity.
5. Design evidence-based weight management programs incorporating appropriate nutrition and physical activity interventions.
6. Apply health education principles to promote healthy lifestyle practices, nutritional awareness, and long-term weight management.

COURSE CONTENTS

UNIT-I

15 Hours

- Introduction to nutrition and its importance in health promotion.
- Meaning, definition, and scope of nutrition.
- Principles of healthy eating and nutritional well-being.
- Factors influencing nutritional requirements:
 - Age
 - Gender
 - Physical activity
 - Physiological status
 - Health conditions
- Planning and development of balanced nutrition plans.
- Major nutrients in the human diet and their functions.
- Daily dietary requirements for individuals with varying activity levels.
- Nutritional considerations before, during, and after physical activity.
- Role of health education in promoting healthy dietary habits.
- Nutrition and disease prevention.

UNIT-II**14 Hours**

- Digestion, absorption, and metabolism of nutrients.
- Energy production and utilization in the human body.
- Carbohydrates:
 - Meaning and classification
 - Functions and dietary sources
 - Role in physical activity and exercise
- Proteins:
 - Meaning and classification
 - Functions and dietary sources
 - Importance in growth, repair, and exercise
- Fats:
 - Meaning and classification
 - Functions and dietary sources
 - Role in energy storage and physical performance
- Vitamins:
 - Classification, functions, and deficiency disorders
- Minerals:
 - Classification, functions, and health significance
- Water and hydration:
 - Importance of water balance
 - Fluid requirements and hydration strategies
- Daily caloric requirements and energy expenditure.
- Nutritional recommendations for active and sedentary individuals.

UNIT-III**16 Hours**

- Introduction to weight management.
- Concept and importance of weight management in modern lifestyles.
- Factors affecting body weight and body composition.
- Health benefits of maintaining optimal body weight.
- Body Mass Index (BMI):
 - Concept and calculation
 - Interpretation and applications
- Obesity:
 - Definition and classification
 - Types of obesity
 - Causes and risk factors
- Health risks associated with overweight and obesity.
- Weight management through diet and physical activity.

- Common myths and misconceptions about weight loss.
- Spot reduction: scientific perspective.
- Dieting versus exercise for weight control.
- Lifestyle interventions for healthy weight maintenance.
- Strategies for preventing obesity and related disorders.

UNIT-IV

15 Hours

- Principles of planning weight management programs.
- Assessment of calorie intake and energy expenditure.
- Determination of desirable body weight.
- Components of a balanced diet.
- Nutritional requirements for children, adolescents, adults, and older adults.
- Balanced diet planning for Indian school children.
- Development of healthy lifestyle practices.
- Role of diet and exercise in weight gain and weight loss.
- Designing individualized diet plans.
- Preparation of exercise schedules for weight management.
- Monitoring and evaluation of weight management programs.
- Health education strategies for promoting healthy lifestyle behaviors.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Srilakshmi B. Nutrition Science. 8th ed. New Delhi: New Age International Publishers; 2023.*
- *Mudambi SR, Rajagopal MV. Fundamentals of Foods, Nutrition and Diet Therapy. 7th ed. New Delhi: New Age International Publishers; 2022.*
- *Bamji MS, Krishnaswamy K, Brahmam GNV. Textbook of Human Nutrition. 5th ed. New Delhi: Oxford and IBH Publishing Co.; 2023.*
- *Mahan LK, Raymond JL. Krause's Food and the Nutrition Care Process. 16th ed. St. Louis: Elsevier; 2024.*
- *Whitney E, Rolfes SR. Understanding Nutrition. 16th ed. Boston: Cengage*

Learning; 2023.

Course Title: General Medicine II (Practical)	L	T	P	Cr.
Course Code: DHA506	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Explain the etiology, pathophysiology, clinical manifestations, diagnostic procedures, and management of common respiratory diseases.
2. Identify and describe common dermatological, infectious, and tropical diseases, including their prevention and treatment strategies.
3. Assess cardiovascular symptoms and explain the diagnosis, management, and prevention of major cardiovascular disorders.
4. Demonstrate knowledge of psychiatric disorders, mental health assessment, and the principles of psychological and psychiatric care.
5. Interpret common clinical findings and diagnostic investigations related to respiratory, cardiovascular, dermatological, and psychiatric conditions.
6. Apply preventive, therapeutic, and referral principles in the management of patients with medical disorders encountered in primary and secondary healthcare settings.

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Comprehensive Patient Assessment

- Collection of patient history.
- Assessment of vital signs and general health status.
- Identification of common clinical symptoms and signs.

General and Systemic Physical Examination

- General physical examination techniques.
- Examination of the respiratory system.
- Examination of the cardiovascular system.
- Examination of the nervous system.
- Examination of the gastrointestinal and musculoskeletal systems.

Medication Administration

- Principles of safe medication administration.
- Preparation and administration of oral, topical, and parenteral medications.

- Observation and documentation of therapeutic effects and adverse reactions.

Oxygen Therapy

- Indications and precautions for oxygen administration.
- Administration of oxygen using various delivery devices:
 - Nasal cannula
 - Simple face mask
 - Venturi mask
 - Non-rebreather mask
- Monitoring patients receiving oxygen therapy.

Nebulization Therapy

- Preparation and operation of nebulization equipment.
- Administration of nebulized medications.
- Patient monitoring before, during, and after nebulization.

Chest Physiotherapy

- Techniques of chest physiotherapy.
- Postural drainage.
- Percussion and vibration methods.
- Breathing exercises and airway clearance techniques.

Fluid Balance Monitoring and Documentation

- Measurement and recording of fluid intake and output.
- Maintenance of fluid balance charts.
- Documentation of patient observations and nursing records.

Pre-operative Patient Preparation

- Physical and psychological preparation of patients for surgery.
- Pre-operative assessment and checklist preparation.
- Patient education regarding surgical procedures.
- Infection control and safety measures before surgery.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Khurana I. Textbook of Medical Physiology. 4th ed. New Delhi: Elsevier; 2023.*
- *Kaplan HI, Sadock BJ, Grebb JA. Kaplan and Sadock's Synopsis of Psychiatry. 13th ed. Philadelphia: Wolters Kluwer; 2024.*
- *Ahuja N. A Short Textbook of Psychiatry. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Park K. Park's Textbook of Preventive and Social Medicine. 28th ed. Jabalpur: Banarsidas Bhanot Publishers; 2025.*
- *Mishra AK. Textbook of Medicine for Allied Health Sciences. 2nd ed. New Delhi: CBS Publishers & Distributors; 2023.*

Course Title: General Surgery II (Practical)	L	T	P	Cr.
Course Code: DHA507	0	0	4	2

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Describe the anatomy, physiology, and common disorders of the reproductive system and explain the principles of maternal and reproductive healthcare.
2. Identify the clinical manifestations, investigations, and management strategies of common gastrointestinal, hepatobiliary, and genitourinary surgical disorders.
3. Perform basic assessment of ophthalmic conditions and recognize eye diseases requiring immediate management or referral.
4. Explain the etiology, clinical features, prevention, and treatment of common ENT disorders and oral health conditions.
5. Demonstrate appropriate decision-making skills in the early recognition, referral, and supportive management of surgical and emergency conditions encountered in healthcare settings.
6. Apply principles of patient education, preventive healthcare, and infection control in the management of reproductive, ophthalmic, ENT, and oral health disorders

SUGGESTED PRACTICAL'S / DEMONSTRATION

List of Practical's / Experiments:

60 hours

Introduction to Laparoscopic Instruments and Equipment

- Identification, handling, care, and maintenance of laparoscopic instruments and accessories.
- Familiarization with laparoscopic setup and operating room requirements.

Operation Theatre (OT) Patient Transfer and Positioning

- Safe shifting and transportation of patients to and from the operation theatre.
- Patient positioning techniques for various surgical procedures.
- Principles of patient safety and infection control during transfer.

Pre-operative Assessment and Preparation

- Collection of patient history and clinical examination.
- Pre-operative investigations and documentation.

- Preparation of patients for surgery, including consent procedures and surgical site preparation.

Basic Surgical Skills and Urological Procedures

- Observation and demonstration of fundamental surgical techniques.
- Assistance in and understanding of:
 - Suprapubic cystostomy
 - Urethral dilatation
 - Cystolithotomy
 - Varicocelectomy
 - Orchidectomy
 - Ureterolithotomy
- Principles of asepsis, tissue handling, suturing, and wound care.

Excision and Drainage Procedures

- Clinical assessment and management of cystic lesions.
- Observation and assistance in excision of cysts.
- Incision and drainage (I&D) of abscesses.
- Post-operative wound management and dressing techniques.

Breast Lump Evaluation and Surgical Excision

- Clinical examination and assessment of breast lumps.
- Pre-operative preparation and surgical assistance during breast lump excision.
- Specimen handling and post-operative care.

TRANSACTIONAL MODES

Lecture, Tutorial, Problem based learning, small group teaching and learning, Continuous interactive learning, Case-based, Project based, Seminars, Clinical conferences, E-learning, Skills laboratory, Industrial visit

SUGGESTED READING

- *Das S. A Concise Textbook of Surgery. 11th ed. Kolkata: Dr. S. Das Publications; 2023.*
- *Norman SW, O'Connell PR, McCaskie AW. Bailey & Love's Short Practice of Surgery. 29th ed. Boca Raton: CRC Press; 2024.*
- *Dutta DC. Textbook of Gynecology. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*

- *Konar H. DC Dutta's Textbook of Obstetrics. 10th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.*
- *Khurana AK. Comprehensive Ophthalmology. 8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2024.*

6TH SEMESTER

Course Title: Internship	L	T	P	Cr.
Course Code: DHA601	0	0	0	20

Total Hours 60 hrs

Course Outcomes: At the end of the course students will be able to...

1. Demonstrate competency in providing basic patient care, clinical assistance, and healthcare support services in hospital and community settings.
2. Apply principles of community health, disease prevention, health promotion, and primary healthcare management in real-world situations.
3. Perform essential clinical procedures and maintain accurate patient records while adhering to safety and ethical standards.
4. Participate effectively in healthcare teams and communicate professionally with patients, families, and healthcare professionals.
5. Plan, implement, monitor, and evaluate community-based health programs and healthcare activities.
6. Conduct a community health-related project, analyze findings, prepare a scientific report, and present the outcomes effectively.

COURSE DESCRIPTION

The six-month internship is designed to provide students with hands-on clinical and community-based training in healthcare settings. The internship enables students to integrate theoretical knowledge with practical skills and develop professional competence in patient care, community health services, health education, and healthcare management. Students will work under the supervision of qualified healthcare professionals and faculty members in hospitals, primary healthcare centers, community health organizations, and related healthcare institutions.

CLINICAL TRAINING COMPONENTS

Patient Care and Clinical Practice

- Patient assessment and history taking.
- Measurement and recording of vital signs.
- Assistance in patient examination and treatment procedures.
- Medication administration under supervision.

- Infection prevention and control practices.
- Maintenance of patient records and documentation.
- Patient counseling and health education.

Community Health Services

- Participation in community health surveys.
- Community diagnosis and health needs assessment.
- Health promotion and disease prevention activities.
- Maternal and child health services.
- Immunization programs and outreach activities.
- Screening and referral services.
- Participation in national health programs.

Primary Health Care Management

- Organization and functioning of primary healthcare services.
- Health camp planning and implementation.
- Cold chain and vaccine management.
- Health information management and reporting systems.
- Inventory and logistics management.
- Public health program monitoring and evaluation.

Emergency and Basic Clinical Procedures

- Basic first aid and emergency care.
- Oxygen administration and nebulization.
- Wound care and dressing techniques.
- Pre-operative and post-operative patient care.
- Specimen collection and transportation.
- Referral and follow-up procedures.

Professional Development

- Professional ethics and communication skills.
- Teamwork and interdisciplinary collaboration.
- Time management and workplace responsibilities.
- Quality assurance and patient safety practices.
- Legal and ethical aspects of healthcare services.

TRAINING REPORT / PROJECT WORK

Each student shall undertake a Training Report/Project on a topic related to community health, primary healthcare services, disease prevention, health

education, public health management, or healthcare delivery systems under the guidance of a faculty supervisor.

The project shall include:

- Identification of a relevant healthcare problem or topic.
- Literature review and background study.
- Data collection and analysis (where applicable).
- Preparation of a structured project report.
- Presentation and viva voce examination.

The evaluation shall be based on:

- Clinical performance during internship.
- Maintenance of logbook and attendance.
- Project report quality.
- Seminar presentation.
- Viva voce examination.
- Professional behavior and communication skills.