

(5)

SYLLABUS

BACHELOR IN EEG TECHNOLOGY

4 Years (VIII Semesters)

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



W/ Abu

SEMESTER –I

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Human Anatomy	4	3	1	-	20	80	100
	Core	Human Physiology	4	3	1	-	20	80	100
	Core	General Biochemistry	4	3	1	-	20	80	100
	Core	Electronics & Computer Sciences	4	3	1	-	20	80	100
	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Ability Enhancement Course	Environmental Science and Health	2	2			20	80	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2			20	80	100
Total Credit- 25			Total Contact Hours- 30						
*Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General Elective									

SEMESTER –II

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	General Microbiology	4	3	1	-	20	80	100
	Core	General Pathology	4	3	1	-	20	80	100
	Core	General Pharmacology	4	3	1	-	20	80	100
	Core	Neuro Anatomy & Physiology	4	3	1	-	20	80	100
	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Skill Enhancement Course	Medical terminology and Record keeping	2	2			20	80	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2			20	80	100
Total Credit- 25			Total Contact Hours- 30						
*Credits of MOOC, SWAYAM and NEPTEL will be considered similar to the credits of Open Elective /General									

Elective

SEMESTER –III

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Clinical Neurology – I	4	3	1	-	20	80	100
	Core	Basics of EEG, Principle, Types, Montages	4	3	1	-	20	80	100
	Core	Management of Patient and Machine Used in EEG Technology	4	3	1	-	20	80	100
	Core	EEG Recording Techniques	4	3	1	-	20	80	100
	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Discipline Specific Elective	General Principles and Practices of Public Health/ Forensic Psychology	2	2	-	-	20	80	100
	Ability Enhancement Course	Computer/BASIC EMERGENCY MANAGEMENT	2	2	-	-	20	80	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2	-	-	20	80	100

Total Credit- 27

Total Contact Hours- 32

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

SEMESTER –IV

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Clinical Neurology – II	4	3	1	-	20	80	100
	Core	Advance EEG Technologies – I	4	3	1	-	20	80	100
	Core	Clinical Interpretation of EEG Techniques in Neurology - I	4	3	1	-	20	80	100
	Core	Neurology Medicine – I	4	3	1	-	20	80	100

	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Discipline Specific Elective	Communication skill for Health care professional/ introduction to national healthcare system	3	3	-		20	80	100
	Skill Enhancement Course	MEDICAL LAW/ Ethics in public health	2	2	-	-	20	80	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2	-	-	20	80	100

Total Credit- 28

Total Contact Hours- 33

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

SEMESTER –V

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Intern al	Exter nal	Total
	Core	Advance EEG Technologies – II	4	3	1	-	20	80	100
	Core	Clinical Interpretation of EEG Techniques in Neurology – II	4	3	1	-	20	80	100
	Core	Neurology Medicine – II	4	3	1	-	20	80	100
	Core	Immunology	4	3	1	-	20	80	100
	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Discipline Specific Elective	Medical psychology/ Biostatistics and Research methodology	3	-	-	3	20	80	100
	Ability Enhancement	Entrepreneurship development/ Introduction to quality and patient safety	2	-	-	2	20	80	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2	-	2	20	80	100

Total Credit- 28

Total Contact Hours- 33

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

Elective

SEMESTER –VI

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Recent Advances in EEG and EEG Changes in Clinical Conditions	4	3	1	-	40	60	100
	Core	Recent Advances in EEG, Intraoperative EEG, Polysomnography	4	3	1	-	40	60	100
	Core	Epilepsy Surgery, Intra Operative Brain and Spinal Cord Monitoring	4	3	1	-	40	60	100
	Core	Professionalism and values	4	3	1	-	20	80	100
	Practical	Practical for all subjects/ Clinical Posting	5	-	-	10	50	150	200
	Discipline Specific Elective	HOSPITAL MANAGEMENT/ Basics of clinical Skill Learning	3	3	-		40	60	100
	Skill Enhancement Course	BASIC AND ADVANCE LIFE SUPPORT/ ORGANIZATIONAL BEHAVIOUR	2	2			40	60	100
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2			40	60	100

Total Credit- 28

Total Contact Hours- 33

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

SEMESTER – VII& VIII INTERNSHIP

Subject Code	Course category	Course title	Evaluation	
			Internal	External
	Core	Internship	20	80
	Core	Internship	20	80

Internship is for 12 months,

SEMESTER	CREDIT
I	25
II	25
III	27
IV	28
V	28
VI	28
VII	20
VIII	20

TOTALCREDITS**201****Exit: Honours' EEG Technology****SEMESTER-1****HUMAN ANATOMY**

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

Course Outcomes

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

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

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

Learning Outcomes	
	<ol style="list-style-type: none"> 1. To introduce the students to the concepts related to General anatomy, Muscular, Respiratory, Circulatory, Digestive and Excretory system 2. Demonstrate and understand the basic anatomy of Respiratory and Circulatory system 3. Demonstrate and understand the basic anatomy of Digestive and Excretory system 4. Knowledge of basic concept of human body anatomical structure. 5. Knowledge of interrelationships, gross, functional and applied anatomy of

UNIT-I

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

Musculo-skeletal system:

Types of bones, structure & divisions of the skeleton system, name of all the bones and their parts, joints- classification. Structure and types of muscles

Anatomy of the Nervous system

Central nervous system & Peripheral nervous system- different components

UNIT-II

Anatomy of Circulatory system:

General plan of circulatory system and its components-

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

General plan of circulation, pulmonary circulation

Name of arteries and veins and their positions Lymphatic system - general plan Anatomy of the

Respiratory system:

Organs of Respiratory System (Brief knowledge of parts and position)

UNIT-III

Anatomy of the Digestive system:

Anatomy of alimentary tract; Parts of the tract

Accessory glands of digestion; Pancreas, Liver, Gall Bladder

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

UNIT-IV

Reproductive system

Male Reproductive System

Female Reproductive System Anatomy of the endocrine system

UNIT-V

Name of all endocrine glands their positions

Hormones and their functions- Pituitary, Thyroid, Parathyroid, Adrenal glands, Gonads & Islets of pancreas

PRACTICALS

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

Reference Books:

- a. Human Anatomy Regional and Applied Vol. 1, Vol.2 & Vol.3, B.D.Chaurasia C.B.S.Publishers, New Delhi- 9th edition -2022
2. Hand Book of General Anatomy B.D.Chaurasia, C.B.S.Publishers, New Delhi-9th edition -2022
3. Text Book of Human Histology Inderbir Singh, Jaypee Brothers, Medical Publishers, Delhi -7th edition - 2021

5. Gray's Anatomy Susan Standring, Elsevier Churchill Livingstone, Edinburg – 42nd edition- 2021

HUMAN PHYSIOLOGY

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

Course Outcomes

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

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

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

Learning outcomes	<ol style="list-style-type: none"> 1. To understand the basic physiological concepts of General physiology 2. To understand the basic physiological concepts of Hematology 3. To understand the basic physiological concepts of Nerve-Muscle physiology. 4. To understand the basic physiological concepts of Respiratory physiology. 5. To understand the basic physiological concepts of Cardiovascular physiology
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UNIT-I

General Physiology

Cell, Transport across cell membrane, homeostasis, resting membrane potential, action potential

Blood

Composition and functions of Blood

RBC, WBC, Platelet count, Hemoglobin

Blood Groups - ABO and RH grouping

Hemostasis & Anticoagulants

UNIT-II

Cardio vascular system

Cardiac muscle, Pacemaker & conducting tissue

Cardiac Cycle

Cardiac output, Heart rate, ECG

Arterial blood pressure

Respiratory System

Functions of Respiratory system

Mechanism of respiration, lung volumes & capacities

UNIT-III

Nerve & Muscle physiology

Neuron structure & properties

Neuromuscular junction

Skeletal muscle structure mechanism of contraction

Cerebrospinal Fluid (CSF): Composition, functions & Circulation.

Central & autonomic Nervous system Organization of CNS

Functions of various parts of Brain, in brief

Composition, functions and circulation of CSF

Differences between sympathetic and parasympathetic division

UNIT-IV

Digestive system

Functional Anatomy, organization & innervations

Composition and functions of all Digestive juices

Digestion & Absorption of carbohydrates, proteins and fats

UNIT-V

Excretory System

Kidneys: Functions, Nephron, Juxta-glomerular Apparatus

Renal circulation

Mechanism of Urine formation

GFR

Endocrine and Reproductive systems Endocrine glands & hormones secreted

Functions of Reproductive system

Male Reproductive System: spermatogenesis, Testosterone.

Female reproductive system: Ovulation, Menstrual cycle.

Pregnancy test

PRACTICALS

1. Estimation of Hemoglobin Concentration

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

Reference Books:

1. A.K.Jain, Textbook of Physiology (Volume I & II) -9th edition -2021.
2. Dr. Venkatesh.D and Dr. Sudhakar H.S.Basic of Medical Physiology- Wolter-Kluwer Publication-
edition – 4th edition - 2018
3. Chaudhari (Sujith K) Concise Medical Physiology - New Central Book- 7th edition - 2016

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GENERAL BIOCHEMISTRY

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

Course Outcomes

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

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

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

Learning outcome	<ol style="list-style-type: none"> To identify the five classes of polymeric biomolecules and their monomeric building blocks. Explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action. Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP. Describe how fats and amino acids are metabolized, and explain how they can be used for fuel.
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UNIT-I

Cell: Morphology, structure & functions of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes.

Carbohydrates: Definition, chemical structure, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopolysaccharide and its importance, glycoproteins

UNIT-II

Lipids: Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid. Essential fatty acids and their importance, Blood lipids and their implications, cholesterol with its importance.

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

UNIT-III

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

Nutrition 1) Vitamins: Types, functions and role. 2) Principal minerals and their functions (Ca, P, Mg, Na, K, Cl) 3) Balanced diet, Diet for Chronically and terminally ill patients, post-operative patients

UNIT- IV

Carbohydrate Metabolism: Glycolysis, TCA cycle, Glycogen metabolism, Gluconeogenesis, Maintenance of Blood Glucose. Diabetes Mellitus and its complications. 9. Lipid Metabolism: Beta oxidation, Ketone bodies, Cholesterol and atherosclerosis, obesity.

UNIT-V

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

PRACTICALS

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

Reference Books:

- 1: Essentials of Biochemistry – U.Satyanarayan , U.Chakrapani – 4th edition-2021
- 2: A textbook of Biochemistry – Dr SK Gupta – 2nd edition.-2019
- 3: Concise textbook of Biochemistry for paramedical students – DM Vasudevan, Sukhas Mukherjee – 2nd edition.-2021
- 4: Essentials of Biochemistry - Pankaj Naik -6th edition.-2022



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

ELECTRONICS & COMPUTER SCIENCES

Course Outcomes

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

	CO Statement	Taxonomy
	Develop a clear understanding of the fundamental concepts, theories, and principles in electronics and computer sciences	Understanding
	Acquire practical skills in applying theoretical knowledge to real-world problems in electronics and computer sciences.	Application
	Demonstrate proficiency in programming languages relevant to the course.	Learn
	Design, analyze, and simulate electronic circuits using software tools.	Analyze
	Remember electrical concept and elements of EEG.	Remember

Taxonomy: Remember, Understand, Apply, Analyze, Learn.

Learning Outcomes	<ol style="list-style-type: none"> 1. Gain a solid understanding of the foundational concepts, theories, and principles in electronics and computer sciences, including digital systems, circuits, programming languages, algorithms, data structures, and computer architecture. 2. Develop strong problem-solving skills by applying logical reasoning, critical thinking, and analytical approaches to identify, analyze, and solve complex problems in the field of electronics and computer sciences.
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UNIT-I

ELECTRICAL CONCEPTS

- **Definition and units of Basic electrical quantities:** Voltage, current, charge, power, resistance, capacitance, impedance reactance, AC and DC, power factor, RMS, average and maximum value of AC.
- **Circuit Elements:** Resistors, capacitors, inductors-types symbol, colour code representations series and parallel combination and their equivalent.
 - **Transformer** – types and construction detail.
 - **Circuit laws:** Ohm's law, Kirchoff's voltage law, Kirchoff's current law, Wheat stone bridge.
 - **Motors:** types and uses.

UNIT-II

ELEMENTS OF ELECTRONICS

- Atomic structures, material classification according to their conduction, electronic emission.
- Semi-conductors- intrinsic, extrinsic, P type, N type, diodes, transistors, characteristics, schematic presentation.
- Application of diodes as a switch and rectifier, HWR, FWR, bridge rectifier.
- Application of transistor as an amplifier
- Power supply Unit.
- Introduction to integrated circuit.
- Introduction to Operational amplifiers - adder, subtractor multiplier, sine wave generator, square wave generator triangular generator, Schmitt trigger.

UNIT-III

DIGITAL CIRCUITS

- Binary number system, bits, bytes, octal, hexadecimal, addition, subtraction, 1st complement and 2nd complement.
- **Gates:** Universal gates OR, AND, NOT, EXOR, EXNOR. Truth table and Boolean expression.
- A-D converter

UNIT-IV

ELECTRICAL SAFETY AND MEDICAL EQUIPMENTS

- Physiological effect of electrical current, shock hazards from electrical equipment, methods of accident prevention.
- Classification of medical equipments according to the
 - Type of protection
 - Mode of protection

BIOELECTRICITY

Biological potentials, ECG, EEG, EMG sources of Bio-electric potential, cell resting potential, action potential and their propagation, electrodes and transducers.

TRANSDUCERS

Their principle, active and passive transducer, transducer used in bio-medical applications.

UNIT-V

ELECTROENCEPHALOGRAPH: -

- Block diagram, EEG amplifier – preamplifier, differential amplifier, basic concept, input impedance, common mode rejection ratio, pen amplifier, buffer amplifier, driving amplifier, isolation amplifier.
- Electrodes, types, surface or sub-dermal, ground reference electrode – metal clip on the earlobe.
- Filters – low frequency filters, high frequency filters, 60 Hz or notch filters, frequency response curves and time constant.
- Sensitivity and calibration of EEG amplifiers, paper speed, pen mechanism, other recording devices – CRO, principles of averaging, analog vs digital section SN ratio.

COMPUTER SYSTEM:

- Introduction to computers – Application of computers – Concepts of Data and information – Atypical computer system – Memory concepts – History of computers – Types of computers.
- Input - output devices – Data storage devices – Software–The definition – the role of software – Housekeeping.
- The computer Internals – Typical PC configuration – Booting – Virus, Anti- virus, Data compression Techniques – On software – Versions of software.
- Number system – Binary Arithmetic – Standard codes for unit of Information.
- Operating system - Definition – Classification – Introduction to windows – Features of Windows – Desktop and Desktop icons – Starting programs – Browsing and managing windows explorer – setting – Taskbars and creating short cuts.
- Introduction to MS-DOS and WINDOWS
- MSOffice–MS–Word, Power point, Access & Excel. Introduction to Internet and E-Mail

Reference Books:

- Clinical Electroencephalography- by MisraUk



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


Course Outcomes:

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none"> 1. Current environmental issues and highlights the importance of adopting an interdisciplinary approach. 2. Sample an ecosystem to determine population density and distribution. 3. Create food webs and analyse possible disruption of feeding relationship
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UNIT-I

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

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

UNIT-II

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

UNIT-III

Introduction to AYUSH system of medicine-Introduction to Ayurveda; Yoga and Naturopathy; Unani; Siddha; Homeopathy; Need for integration of various system of medicine.

UNIT-IV

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

UNIT-V

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

Reference books:

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



SEMESTER –II

GENERAL MICROBIOLOGY

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

Course Outcomes

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

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

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

Learning Outcome	Upon completion, students should be able to demonstrate:
	<ol style="list-style-type: none"> 1. Knowledge of microorganisms and the disease process as well as aseptic and sterile techniques. 2. Perform microbiological laboratory procedures according to appropriate safety standards

UNIT-I

Microorganisms

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

UNIT-II

Sterilization

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

Disinfection

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

UNIT-III

Asepsis

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

UNIT-IV

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

UNIT-V

Immunity – Non-specific

- Natural & Acquired
- Allergy and Anaphylaxis

PRACTICALS:

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

Reference books:

- 1: Complete Microbiology – 7 th edition -2022
- 2: Text & Practical Microbiology – CP Baveja& V Baveja – 3rd edition - 2022
- 3: Essentials of Medical Microbiology- Apurba S Sastry & Sandhya Bhat – 3rd edition-2021
- 4: Textbook of Microbiology – 12th edition- 2022



GENERAL PATHOLOGY

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

Course Outcomes

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

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

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

Learning Outcomes	<ol style="list-style-type: none"> The student should submit the appropriate tissue sections per protocol to demonstrate the lesion and other clinically-relevant information needed for the final pathologic report. To aid hematology in the reference ranges for hemoglobin, hematocrit, erythrocytes, and leukocytes in infants, children and adult.
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UNIT: I

Cell injury, cellular adaptation and cell death

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

UNIT-II

Inflammation and Repair

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

UNIT-III

Fluid and Hemodynamic disturbances

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

UNIT-IV

Neoplasia

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

UNIT-V

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

- Anemia-classification, morphological and Etiological, effects of anemia on body.

PRACTICALS

1. Collection of blood Samples
2. Various instruments used in Hematology
3. H b estimation.
4. Blood grouping
5. Urine complete examination

Reference Books:

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

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

PHARMACOLOGY

Course Outcomes

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

CO Statement	Taxonomy
Describe the mechanism of anti-anginal drugs, hypertension, arrhythmias & partial or complete heart failure.	Remember
Explain the pharmacotherapy of insomnia & importance of new generation anti-histaminic drugs over old generation antihistamines.	Understand
Determine the corticosteroids & drugs which inhibit acid formation to prevent acidity and stomach/peptic ulcer.	Apply
Analyse the anti-thrombotic agents, lipid lowering agents & anti-atherosclerotic agents.	Analyse
Assess the antibacterial drugs & Narcotics with indications & contraindication in day to day life	Evaluate
Formulate the types of anesthesia and mechanism of action of local & general anesthetic drugs.	Create

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

Learning Outcomes	<ol style="list-style-type: none"> Students will be proficient in Pharmacology with proficient knowledge about the different drugs / medicines to be given in various cardiovascular diseases, dose calculation and mode of administration. Also recent advances in pharmacology will play a key role in research aspect of the students
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UNIT- I

General Pharmacology

- a) Absorption, distribution, metabolism and elimination of drugs,
- b) routes of drug administration.
- c) Adverse reactions to drugs.
- d) Factors modifying drug response

UNIT- II

Autonomic nervous system & Peripheral nervous system

- b) Sympathetic nervous system - sympathomimetics, sympatholytic
- c) Parasympathetic - Cholinergic, Anticholinergics Drugs
- d) Skeletal muscle relaxants
- e) Local anesthetics

UNIT- III

Central nervous system

- b) Drug therapy of various CNS disorders like epilepsy, depression.
- c) Non-steroidal anti-inflammatory drugs
- d) General anesthetics

AUTOCOIDS

- a) Histamine and antihistaminic

UNIT- IV

Cardiovascular system

- a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias
- b) Diuretics
- c) Coagulants and anticoagulants, antiplatelet drugs
- d) Hypo-lipidemic

Gastrointestinal and respiratory system

- a) Drug treatment of peptic ulcer
- b) Drug therapy of bronchial asthma

UNIT- V

Hormones

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

PRACTICALS

Practical based on the topics mentioned in the theory syllabus

Reference Books:

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

NEURO ANATOMY & PHYSIOLOGY

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

Course Outcomes

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

CO Statement	Taxonomy
Recall the basic anatomical structures and functions of the nervous system, including the brain, spinal cord, and peripheral nerves.	Remember
Explain the basic principles of neural communication and the role of neurotransmitters in transmitting signals.	Understand
Apply knowledge of neuroanatomy to interpret and explain the functions and processes associated with specific brain regions or neural pathways.	Apply
Analyze the relationships between neural structures and their corresponding functions, such as sensory perception, motor control, or cognitive processes.	Analyze
Evaluate the implications of neuroanatomy and neurophysiology in the diagnosis and treatment of neurological disorders	Evaluate
Synthesize knowledge of neuroanatomy and neurophysiology to propose innovative solutions or interventions for neurological disorders or conditions.	Create

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

Learning Outcomes	<ol style="list-style-type: none"> 1. Develop a comprehensive understanding of the structure, organization, and function of the nervous system, including the brain, spinal cord, and peripheral nerves. 2. Gain insight into the physiological processes that underlie neural function, such as the generation and propagation of action potentials, synaptic transmission, and neural signaling. 3. Acquire knowledge about the different regions of the brain and their associated functions, including sensory perception, motor control, language processing, memory, and emotions. 4. Develop an understanding of common neurological disorders and their impact on brain structure and function. Explore the causes, symptoms, and potential treatments for disorders such as stroke, epilepsy, Alzheimer's disease, and traumatic brain injury.
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UNIT- I

Neuro – Anatomy

- Sub Divisions of Nervous System:
 - Central
 - Peripheral
 - Autonomic

UNIT- II

- BRAIN

Lobes, functions – Dissection Hall

Gyri, Sulci, Cortical areas – Demonstration Association commissural areas Brain Stem, Cerebellum

UNIT- III

- Sensory and motor pathways
- Pyramidal system
- Upper and lower motor neuron
- Spinal cord
- Peripheral nervous system
 - Cranial nerves–origin, distribution, pathways
 - Spinal cord and spinal nerves
 - Formation of plexus
 - Muscles – origin, insertion nerve supply and action.
 - Concept of myotomes and dermatomes

UNIT- IV

- EEG Generators
- Resting membrane potential and action potential generation.
- Physiology of Nerve Conduction and Muscle Contraction.
- Commissural pathways and association areas Physiology of Neuromuscular Junction transmission.
- Motor and sensory tracts.
- Sensory receptors.

Reference Books:

- Essentials of Medical Pharmacology- by KD Tripathi
- Clinical Neurology Made Easy – by HV Srinivas



SKILL ENHANCEMENT COURSE

MEDICAL TERMINOLOGY AND RECORD KEEPING

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes	<ol style="list-style-type: none">1. Ensuring successful learning of basic and advance medical terminology2. Student will able to read, write, spell and understand the medical terminology3. Understand the types, importance and role of medical records and its management techniques.
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UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Reference Books:

2. Davies, Juanita. Essentials of Medical Terminology. 3rd edition. New York. Delmar. 2008.
- Mogli. J.D. Medical Records: Organization & Management 2nd edition New Delhi: Jaypee Brothers.

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SEMESTER 3 CLINICAL NEUROLOGY – I

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

Course Outcomes

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

CO Statement	Taxonomy
Memorize the diagnostic criteria and classification of common neurological disorders.	Remember
Explain the principles of neurologic examination and diagnostic techniques used in clinical neurology.	Understand
Apply critical thinking skills to interpret clinical data, imaging results, and laboratory findings in the context of neurological conditions.	Apply
Analyze the impact of neurological disorders on a patient's quality of life, functional abilities, and psychosocial well-being.	Analyze
Evaluate the efficacy and safety of various treatment modalities, including pharmacological, surgical, and rehabilitative interventions, in the management of neurological disorders.	Evaluate
Design comprehensive management plans for patients with complex neurological conditions, considering multidisciplinary approaches and individualized patient needs.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Accurate diagnosis and classification of neurological disorders. 2. Understanding of underlying mechanisms and pathophysiology. 3. Evidence-based treatment planning and management. 4. Interpretation of diagnostic tests and imaging studies. 5. Effective communication with patients, families, and healthcare teams.
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Concepts of Disease and outlines of Clinical Evaluation related to Neural Science-

1. Epilepsy
2. CNS Infections- Meningitis, Encephalitis
3. Peripheral Neuropathies
4. Muscle Disorders
5. Neuromuscular Junction Disorders
6. Demyelinating disorders
7. Space occupied lesion.
8. Pediatric condition.
9. Electroencephalogram.

Reference Books:

- Clinical Neurology Made Easy – by HV Srinivas

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BASICS OF EEG, PRINCIPLE, TYPES, MONTAGES

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Basics of EEG, Principle, Types, Montages	4	3	1	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
Recall the basic principles and terminology associated with electroencephalography (EEG).	Remember
Understand the significance of different EEG patterns in relation to brain activity and neurological disorders.	Understand
Apply knowledge of EEG principles to interpret and analyze EEG recordings for basic clinical purposes	Apply
Analyze the effect of different electrode montages on the spatial representation and interpretation of EEG signals.	Analyze
Evaluate the quality and reliability of EEG recordings, considering factors such as artifact identification and reduction techniques.	Evaluate
Design and create EEG montages for specific clinical scenarios, considering the desired sensitivity, spatial resolution, and interpretability of the recorded EEG signals.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Understand the basic principles of EEG and the different types of brain waves. 2. Identify and interpret EEG patterns associated with normal brain activity and abnormal neurological conditions. 3. Apply appropriate electrode placements and montages for recording and analyzing EEG signals. 4. Analyze and differentiate EEG artifacts from true brain activity. 5. Evaluate the clinical significance and diagnostic value of EEG recordings for various neurological disorders.
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1. Principles of EEG recording
2. Montage and localization.
3. Cancellation and summation

TECHNICAL ASPECTS:

1. Different parts of EEG machine and its functions, i.e. montage, electrodes, filter, calibration, sphenoid electrode, depth electrodes
2. Electroencephalographic monitoring (in patients and ambulatory), Video Electroencephalography, Intraoperative records, Quantitative electroencephalography, Brain mapping and others (in brief)
3. Electroencephalography's reporting
4. Record keeping

Practical:

1. EEG Machine
2. Calibration
3. Bio calibration

Reference Books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUk

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MANAGEMENT OF PATIENT AND MACHINE USED IN EEG TECHNOLOGY

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Management of Patient and Machine Used in EEG Technology	4	3	1	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
Recall the essential safety protocols and guidelines for preparing and positioning patients for EEG recordings.	Remember
Demonstrate an understanding of the principles and importance of patient safety and comfort during EEG recordings.	Understand
Apply appropriate techniques for preparing patients, including electrode placement, skin preparation, and patient positioning.	Apply
Analyze and troubleshoot technical issues or artifacts in EEG recordings, such as electrode impedance, electrical interference, or motion artifacts	Analyze
Evaluate the quality and validity of EEG recordings, considering factors such as signal clarity, artifact reduction, and patient compliance.	Evaluate
Design and implement protocols for patient preparation, including considerations for specific patient populations or clinical scenarios.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Apply safety protocols for patient preparation and positioning during EEG recordings. 2. Understand the functioning and operation of EEG machines and related equipment. 3. Analyze and troubleshoot technical issues and artifacts in EEG recordings. 4. Evaluate the quality and validity of EEG data for accurate interpretation. 5. Create protocols and innovative approaches to optimize patient comfort and data acquisition in EEG recordings.
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W. Abou

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1. Cerebral vascular diseases
2. Toxic, metabolic and endocrine conditions
3. Infections disease
4. Psychiatric disorder.
5. Drug effects on EEG.
6. Disorders of sleep

Practical:

- Clinical Neurology
- Applied Pharmacology

Reference Books:

- Clinical Neurology Made Easy – by HV Srinivas
- Clinical Electroencephalography- by MisraUk

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EEG RECORDING TECHNIQUES

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

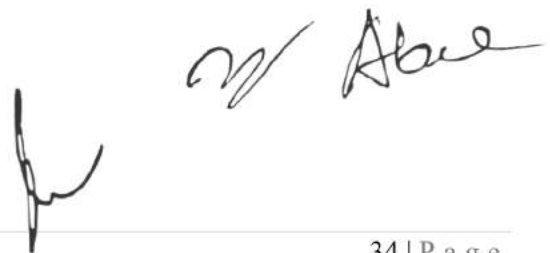
Course Outcomes

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

CO Statement	Taxonomy
Remember the different electrode systems and placements used in EEG recordings.	Remember
Demonstrate an understanding of the factors influencing electrode placement, including international 10-20 system and 10-10 system	Understand
Apply proper techniques for electrode placement and preparation in EEG recordings.	Apply
Analyze and interpret EEG waveforms, identifying normal patterns and abnormalities associated with various neurological conditions.	Analyze
Evaluate the quality and reliability of EEG recordings, considering factors such as electrode impedance, noise, and artifact reduction techniques.	Evaluate
Design and create customized electrode montages or configurations to address specific clinical or research needs.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Understand and apply appropriate electrode placement and preparation techniques in EEG recordings. 2. Analyze and interpret EEG waveforms, identifying normal patterns and abnormalities associated with neurological conditions. 3. Evaluate and optimize the quality of EEG recordings, including electrode impedance, noise reduction, and artifact management. 4. Apply knowledge of electrode systems and montages for specific clinical or research objectives. 5. Create customized electrode configurations and propose innovative approaches to enhance EEG recording techniques.
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1. Principles of EEG recording
2. Recording techniques
3. Effects on EEG.
4. The 10-20System.
5. Reference and Bipolar Technique
6. Reference contamination
7. Fields
8. Cancellation and summation
9. Phase reversal.

PRACTICAL

1. Neurophysiology
2. Electronics and computer

Reference Books:

Clinical Neurology Made Easy – by HV Srinivas

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CLINICAL POSTING

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

45 days of clinical posting is mandatory.




GENERAL PRINCIPLES AND PRACTICES OF PUBLIC HEALTH/ FORENSIC PSYCHOLOGY

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Discipline Specific Elective	General Principles and Practices of Public Health/ Forensic Psychology	2	2	-	-	20	80	100

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none"> 1. To acquire understanding of the functions of management and administration of the healthcare business. 2. To understand healthcare delivery systems. 3. To acquire and practice leadership and managerial skills that will positively affect performance as a healthcare manager 4. Learn the basic nursing skills of various surgical procedures including the surgical instruments used in the surgical procedures 5. Assist in various invasive and non-invasive procedures
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UNIT-I

Introduction to Patient Care:

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

Communication:

Communication with doctors, colleagues and other staffs. b) Non-verbal communication, Inter-personnel relationships. c) patient contact techniques, communication with patients and their relatives

Documentation:

a. Importance of documentation, b. initial and follow up notes; c. documentation of therapy, procedures and communication.

UNIT-II

Universal Precautions and Infection Control:

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

UNIT-III

Medication Administration:

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

UNIT-IV

Bedside care:

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

Monitoring of Patient:

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

UNIT-V

Dressing and wound care:

a) Bandaging: basic turns, bandaging extremities, triangular bandages and their application. b) Surgical dressing: observation of dressing procedures. c) Suture materials and suturing techniques d) Splinting e) Basic care of patient with burns.

Reference books:

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

FORENSIC PSYCHOLOGY

UNIT-I

The Psychology of Criminal Conduct
Offender Profiling

UNIT-II

Eyewitness Testimony and Identification
Investigative Interviewing of Children

UNIT-III

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

UNIT-IV

The Psychology of False Confessions
Famous Miscarriages of Justice

UNIT-V

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

Reference books:

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

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COMPUTER/BASIC EMERGENCY MANAGEMENT

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	On completion of this course, the students will be able to do the following: 1. Systems Thinking. 2. Problem-Solving. 3. Communication. 4. Teamwork. 5. Context Awareness.
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UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

MS-POWERPOINT: Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents.



BASIC EMERGENCY MANAGEMENT

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	On completion of this course, the students will be able to do the following: 1. Emergency planning 2. Prevent fatalities & injuries 3. Complex medical and surgical emergencies management.
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UNIT-I

Emergency Equipment

1. Laryngoscopes
2. Endo-tracheal tubes (ETT), boogie
3. Ambu bag and mask
4. Airway adjuncts, supra-glottic airway devices including Laryngeal mask airway (LMA)
5. Types of oxygen masks, venturi etc.
6. Oropharyngeal and nasopharyngeal airways (OPA and NPA)
7. ICD tubes, bags, jars, instrument tray
8. Suction apparatus
9. Pulse oximeter
10. EtCO₂ monitor
11. Oxygen pipe-line and medical gas cylinders, pipelines and manifold
12. Ambulance (Cervical) Collar, Philadelphia Collar

UNIT-II

Introductions to Emergency Services

Principles of resuscitation

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

UNIT –III

Specific resuscitative procedures

1. Airway management
2. Breathing and ventilation management
3. Venous and intraosseous access



4. Defibrillation and cardioversion
5. Fluid and blood resuscitation
6. Vasoactive agents in resuscitation
7. Arrhythmias

UNIT-IV

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

UNIT-V

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

Toxicology

Emergencies due to venomous bites and stings:

Industrial Hazards

Obstetrical emergencies

Mental Health Emergencies

Paediatric emergencies

Reference books:

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



Semester 4
Clinical Neurology – II

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

Course Outcomes

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

CO Statement	Taxonomy
Memorize the diagnostic criteria and classification of common neurological disorders.	Remember
Explain the principles of neurologic examination and diagnostic techniques used in clinical neurology.	Understand
Apply critical thinking skills to interpret clinical data, imaging results, and laboratory findings in the context of neurological conditions.	Apply
Analyze the impact of neurological disorders on a patient's quality of life, functional abilities, and psychosocial well-being.	Analyze
Evaluate the efficacy and safety of various treatment modalities, including pharmacological, surgical, and rehabilitative interventions, in the management of neurological disorders.	Evaluate
Design comprehensive management plans for patients with complex neurological conditions, considering multidisciplinary approaches and individualized patient needs.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Accurate diagnosis and classification of neurological disorders. 2. Understanding of underlying mechanisms and pathophysiology. 3. Evidence-based treatment planning and management. 4. Interpretation of diagnostic tests and imaging studies. 5. Effective communication with patients, families, and healthcare teams.
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Unit 1

Disorders of Nervous system

- Viral encephalitis
- Bacterial meningitis
- Cerebral abscess granuloma

Unit 2

- Brain death
- Brain tumors

Unit 3

- Various Types of epilepsy
- Various Epilepsy syndrome
- Resistant Epilepsy
- Status epileptics
- NEAD- Non-epileptic form attack disorder

Unit 4

- Metabolic conditions and EEG

Reference Books:

- Clinical Neurology Made Easy – by HV Srinivas

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Advance EEG Technologies – I

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

Course Outcomes

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

CO Statement	Taxonomy
Remember the technical specifications and operational considerations of advanced EEG equipment and software.	Remember
Understand the advantages, limitations, and applications of high-density EEG and source localization techniques.	Understand
Apply advanced electrode placement and configuration techniques in high-density EEG recordings.	Apply
Analyze and interpret high-density EEG data to identify specific brain activation patterns or abnormalities.	Analyze
Evaluate the appropriateness and validity of advanced EEG technologies for specific research or clinical purposes	Evaluate
Design and implement protocols for advanced EEG data collection and analysis, considering research or clinical objectives.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Understand and apply advanced EEG technologies, including high-density EEG and source localization methods. 2. Analyze and interpret high-density EEG data to identify brain activation patterns and abnormalities. 3. Evaluate the accuracy and reliability of source localization techniques in localizing brain activity. 4. Assess the appropriateness and validity of advanced EEG technologies for research or clinical purposes. 5. Create protocols and innovative approaches to enhance the application and utility of advanced EEG technologies.
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Unit 1

Advanced Electroencephalography

- Normal EEG (awake & sleep)
- Pediatric EEG
- EEG maturation
- Epilepsies

Primary generalized Epilepsies

- Generalized tonic clonic
- Absence
- Myoclonic

Partial Epilepsies

- Simple partial seizures
- Complex partial seizures
- Partial with secondary generalized seizures

Reference Books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUk
3. Current Practice of Clinical Electroencephalography- by John S. Ebersole

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Clinical Interpretation of EEG Techniques in Neurology - I

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Clinical Interpretation of EEG Techniques in Neurology - I	4	3	1	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
Remember the characteristic features of normal and abnormal EEG patterns.	Remember
Understand the EEG patterns associated with different neurological conditions, including epilepsy, sleep disorders, and brain injuries.	Understand
Apply knowledge of EEG interpretation guidelines and criteria to analyze and interpret EEG recordings	Apply
Analyze and interpret EEG waveforms, identifying normal patterns, epileptiform discharges, and other abnormal findings.	Analyze
Evaluate the diagnostic value of EEG findings in the context of patient history, clinical symptoms, and other diagnostic tests.	Evaluate
Create comprehensive EEG reports that effectively communicate the findings, diagnoses, and recommendations for patient management.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Interpret EEG waveforms, identifying normal patterns and abnormal findings related to neurological conditions. 2. Apply EEG interpretation guidelines and techniques for artifact identification and reduction. 3. Analyze EEG abnormalities to localize affected brain regions and determine their clinical significance. 4. Evaluate the diagnostic value of EEG findings in the context of patient history and other diagnostic tests. 5. Create comprehensive EEG reports for effective communication and contribute to patient management decisions.
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Unit 1

- EEG in metabolic disease of cerebrum
- EEG changes in CNS infections
- EEG in head trauma, strokes, tumors
- Video EEG
- Spike detection

Unit 2

- Seizure disorder and its differential diagnosis
- Normal EEG pattern in children and adult, awake and sleep
- Neonatal EEG

Unit 3

- Normal variants
- Artifacts: Eye movements, muscle pulse.
- Activation methods: Hyperventilation, photic stimulation, sleep deprivation, others

Reference Books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUk
3. Current Practice of Clinical Electroencephalography- by John S. Ebersole

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Neurology Medicine – I

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

Course Outcomes

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

CO Statement	Taxonomy
Remember the key clinical features, diagnostic criteria, and treatment options for common neurological disorders.	Remember
Understand the pharmacological and non-pharmacological treatment approaches used in neurology medicine.	Understand
Apply knowledge of clinical neurology to diagnose and manage patients with neurological disorder	Apply
Analyze clinical presentations, diagnostic test results, and imaging findings to differentiate between different neurological disorders.	Analyze
Evaluate the outcomes and effectiveness of treatment interventions in patients with neurological disorders.	Evaluate
Create comprehensive care plans for patients with complex neurological conditions, integrating various treatment modalities.	Create

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

Learning Outcomes:	<ol style="list-style-type: none"> 1. Interpret clinical presentations, diagnostic tests, and imaging findings to diagnose neurological disorders accurately. 2. Apply appropriate treatment strategies for managing and treating various neurological conditions. 3. Analyze the effectiveness and outcomes of treatment interventions in patients with neurological disorders. 4. Evaluate research studies and literature to inform evidence-based practice in neurology medicine. 5. Create comprehensive care plans that integrate various treatment modalities for patients with complex neurological conditions.
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Unit 1

- Drugs used in Cerebrovascular disorder
- Drugs used in Epilepsy

Unit 2

- Drugs used in Bacterial meningitis
- Drugs used in CNS Infections- Meningitis, Encephalitis
- Drugs used in Peripheral Neuropathies
- Drugs used in Psychiatric disorder.

Reference Books:

1. Clinical Neurology Made Easy – by HV Srinivas

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Clinical Posting

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

45 days of Clinical posting is mandatory



Course Code	Course Category	Paper Title	Credits	Contact per week	Evaluation
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				L	T	P	Internal	External	Total
	Practical	Hematology – II	1	-	-	2	20	80	100

Hematology – II

Course Outcomes

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

	Recall the fundamental concepts, terminology, and laboratory parameters used in hematology.	Remember
	Understand the diagnostic criteria, classification, and prognostic factors for various hematological conditions.	Understand
	Apply knowledge of hematological parameters to interpret laboratory test results and identify abnormalities.	Apply
	Analyze hematological data, including complete blood counts, peripheral blood smears, and bone marrow aspirates, to differentiate between normal and abnormal findings.	Analyze
	Evaluate the efficacy and appropriateness of treatment modalities for different hematological conditions.	Evaluate
	Create comprehensive reports that effectively communicate hematological findings, diagnoses, and treatment recommendations.	Create

Taxonomy:

Learning Outcome:	<ol style="list-style-type: none"> 1. Interpret hematological laboratory test results and differentiate between normal and abnormal findings. 2. Apply diagnostic algorithms and guidelines for the diagnosis and management of hematological disorders. 3. Analyze and correlate clinical symptoms, laboratory findings, and hematological disorders to guide further investigations. 4. Evaluate treatment modalities for different hematological conditions based on efficacy and appropriateness. 5. Create comprehensive reports communicating hematological findings, diagnoses, and treatment recommendations effectively.
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Practical

1. Determination of Hemophilia A and B



2. Study the morphology of Sickling tests
3. Determination of RBC count.
4. Determination of WBC count.
5. Determination of DLC.
6. Determination of Hb by CMG method.
7. Determination of PCV
8. Determination of ESR by Westergren method and Wintrobe method.
9. Determination of BT and CT
10. Determination of PT and APTT
11. Preparation of LE cells
12. Hb Electrophoresis

Reference Books:

- Harsh Mohan, Text Book of pathology. P. Godkar ,
- Practical pathology P. Chakraborty
- Practical Hematology by JB Dacie



Course Code	Course Category	Paper Title	Credits	Contact per week	Evaluation
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				L	T	P	Internal	External	Total
	Practical	Transfusion Transmitted Infections	1	-	-	2	40	60	100

Transfusion Transmitted Infections

Course Outcomes

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

	Recall the common transfusion transmitted infections (TTIs) and their modes of transmission.	Receive		
	Understand the epidemiology and impact of TTIs on transfusion medicine and public health.	Respond		
	Apply knowledge of donor screening and risk assessment to ensure the safety of donated blood.	Value		
	Analyse the challenges and emerging issues related to TTI prevention and detection	Organize		
	Evaluate the quality assurance measures for TTI screening and testing in blood banks.	Characterize		
	Develop protocols and procedures for effective TTI screening and prevention in transfusion services.	Receive		

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome:	<p>Understand the common transfusion transmitted infections (TTIs) and their modes of transmission.</p> <p>Apply appropriate screening and testing methods for TTIs to ensure safe blood transfusions.</p> <p>Analyze the impact of TTIs on patient safety and transfusion practices.</p> <p>Evaluate the effectiveness of current TTI prevention strategies and quality control measures.</p> <p>Create protocols and guidelines for TTI screening and prevention in transfusion services.</p>
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Practical

- Introduction to Transfusion Transmitted Infections (TTIs) and Laboratory Safety:

Overview of TTIs and their impact on transfusion medicine

Understanding the importance of laboratory safety and biohazard protocols

- Serological Testing for TTIs:

Principles and techniques of serological testing for common TTIs (e.g., HIV, hepatitis B and C, syphilis)

Hands-on practice of serological testing procedures

Quality control measures and interpretation of test results

Reference Books:

- Harsh Mohan, Text Book of pathology.P.Godkar ,
- Practical pathology P.Chakraborty
- Practical Hematology by JB Dacie

Transfusion Techniques – I



Course Code	Course Category	Paper Title	Credits	Contact per week	Evaluation
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				L	T	P	Internal	External	Total
	Practical	Transfusion Techniques – I	1	-		2	40	60	100

Course Outcomes

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

	Recall the basic principles and techniques of transfusion medicine.	Receive
	Understand the principles of compatibility testing and blood typing.	Respond
	Apply knowledge of transfusion techniques to correctly perform and document transfusions.	Value
	Analyse transfusion reactions and complications to identify their causes and appropriate management strategies.	Organize
	Evaluate the effectiveness and limitations of recent advancements in transfusion techniques for improving patient care	Characterize
	Design and implement comprehensive transfusion protocols and procedures incorporating recent advancements.	Receive

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome:	<ol style="list-style-type: none"> 1. Understand the principles and procedures involved in transfusion techniques for safe and appropriate blood product administration. 2. Apply knowledge of blood typing and compatibility testing to ensure proper matching of blood components for transfusion. 3. Analyze and recognize potential transfusion reactions or complications, and respond with appropriate interventions. 4. Evaluate the importance of quality control measures in transfusion services to ensure patient safety and compliance with regulations. 5. Demonstrate effective documentation and communication skills in transfusion procedures to ensure accurate patient records and information flow.
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Practical

- Introduction to Transfusion Techniques:

Overview of transfusion medicine and its importance in patient care

Safety protocols and guidelines for transfusion procedures

Understanding the role of blood components in various clinical scenarios

- Blood Collection and Handling Techniques:

Venipuncture and aseptic blood collection techniques

Proper handling and labeling of blood samples

Transport and storage of blood components

- Compatibility Testing and Crossmatching:

ABO and Rh blood typing methods

Compatibility testing procedures (major and minor crossmatching)

Interpretation of compatibility test results

Reference Books:

- Harsh Mohan, Text Book of pathology.P.Godkar ,
- Practical pathology P.Chakraborty
- Practical Hematology by JB Dacie



Communication skill for Health care professional/ introduction to national healthcare system
Communication skill for Health care professional

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

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

Identify practices for effective verbal communication with patients and other healthcare providers

.Develop skills for listening and paraphrasing. Demonstrate methods of questioning the patient




UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Reference books:

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

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

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

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Course Objective	1. To familiarise with the healthcare environment → To understand the concepts of management with relevance to hospitals
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UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

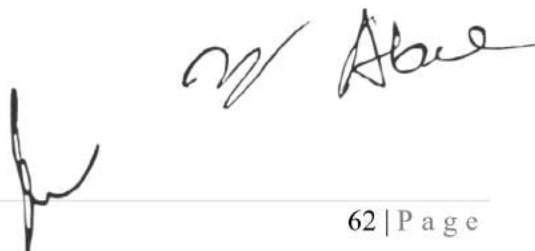
Epidemiology – Aims – Principles – Descriptive, Analytical and Experimental Epidemiology - Methods - Use

Reference books:

- Seth, M.L. MACROECONOMICS, Lakshminarayana Agrawal, Edu, Pub. Agra. 1996
- Peter, Z & Fredrick, B. HEALTH ECONOMICS, Oxford Pub., New York, 1997
- Shanmugansundaram, Y., HEALTH ECONOMICS, Oxford Pub. New York, 1997

SKILL ENHANCEMENT COURSE

MEDICAL LAW



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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none"> 1. The students are expected after the conclusion of the course to be able to: 2. Understand the interplay between ethics and law in the field of biomedicine 3. To identify and analyse the conflicts of interest and legal problems that are relevant in different areas of medical law
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UNIT-I

Medical ethics - Definition - Goal – Scope

Introduction to Code of conduct



UNIT-II

Basic principles of medical ethics –Confidentiality

Malpractice and negligence - Rational and irrational drug therapy

UNIT-III

Autonomy and informed consent - Right of patients

Care of the terminally ill- Euthanasia

UNIT-IV

Organ transplantation

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

UNIT-V

Professional Indemnity insurance policy

Development of standardized protocol to avoid near miss or sentinel events

Obtaining an informed consent

Reference books:

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



Ethics in Public Health

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

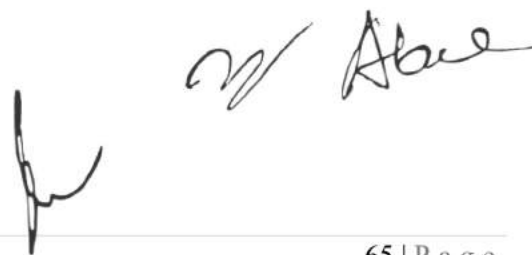
Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes	<p>The students will develop:</p> <ol style="list-style-type: none"> 1. Clinical ethical Competency. 2. Ethical awareness, Empathy
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UNIT-I

Introduction to Public Health Ethics

Theories of Justice and Distribution of Public Health Resources

Principle for Public Health Ethics

UNIT-II

Priority-Setting and Resource Allocation at the Macro Level

Priority-Setting and Resource Allocation at the Micro Level

UNIT-III

Medical Ethics, Legal Aspects and Medical Terminology

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

2) Medical terminology

3) Medical waste Management

UNIT-IV

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

Balancing Individual and Community Interests

Ethics and Health Promotion

UNIT-V

Role of Human Rights in Public Health

Ethics of Health Promotion and Disease Prevention

Reference books:

1.Ethics and Public Health – Archana Rani Sahoo &Patitapaban Das -2017

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

3.Nursing and healthcare ethics-Robinson & Doody-6th edition -2022

4.Ethics- William K.Frankena – 2nd edition-2015



Semester 5

Advance EEG Technologies – II

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

Course Outcomes

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

CO Statement	Taxonomy
Remember the technical specifications and operational considerations of advanced EEG equipment and software.	Remember
Understand the advantages, limitations, and applications of high-density EEG and source localization techniques.	Understand
Apply advanced electrode placement and configuration techniques in high-density EEG recordings.	Apply
Analyze and interpret high-density EEG data to identify specific brain activation patterns or abnormalities.	Analyze
Evaluate the appropriateness and validity of advanced EEG technologies for specific research or clinical purposes	Evaluate
Design and implement protocols for advanced EEG data collection and analysis, considering research or clinical objectives.	Create

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

Learning Outcomes:	6. Understand and apply advanced EEG technologies, including high-density EEG and source localization methods. 7. Analyze and interpret high-density EEG data to identify brain activation patterns and abnormalities. 8. Evaluate the accuracy and reliability of source localization techniques in localizing brain activity. 9. Assess the appropriateness and validity of advanced EEG technologies for research or clinical purposes. 10. Create protocols and innovative approaches to enhance the application and utility of advanced EEG technologies.
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Unit 1

- Epilepsy surgery-
 - Prolonged telemetry EEG
 - Recording ictal period and reporting pre/ictal/postal phases
 - Intra operative recording –(Corticogram)

Practical

- Biocalibration
- Maintenance of Electrodes and EEG machinery
- Normal EEG
 - Awake
 - Sleep

Reference books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUk
3. Current Practice of Clinical Electroencephalography- by John S. Ebersole

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Clinical Interpretation of EEG Techniques in Neurology – II

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Clinical Interpretation of EEG Techniques in Neurology – II	4	3	1	-	20	80	100

Outcomes

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

CO Statement	Taxonomy
Remember the characteristic features of normal and abnormal EEG patterns.	Remember
Understand the EEG patterns associated with different neurological conditions, including epilepsy, sleep disorders, and brain injuries.	Understand
Apply knowledge of EEG interpretation guidelines and criteria to analyze and interpret EEG recordings	Apply
Analyze and interpret EEG waveforms, identifying normal patterns, epileptiform discharges, and other abnormal findings.	Analyze
Evaluate the diagnostic value of EEG findings in the context of patient history, clinical symptoms, and other diagnostic tests.	Evaluate
Create comprehensive EEG reports that effectively communicate the findings, diagnoses, and recommendations for patient management.	Create

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

Learning Outcomes:	6. Interpret EEG waveforms, identifying normal patterns and abnormal findings related to neurological conditions. 7. Apply EEG interpretation guidelines and techniques for artifact identification and reduction. 8. Analyze EEG abnormalities to localize affected brain regions and determine their clinical significance. 9. Evaluate the diagnostic value of EEG findings in the context of patient history and other diagnostic tests. 10. Create comprehensive EEG reports for effective communication and contribute to patient management decisions.
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Unit 1

- Abnormal EEG records
- Definition-spike, sharp, slow waves, other abnormalities
- Abnormal EEG in neurological diseases

Practical

- Recording of EEG
- Trouble shooting

Reference books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUk
3. Current Practice of Clinical Electroencephalography- by John S. Ebersole

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Neurology Medicine – II

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

Course Outcomes

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

CO Statement	Taxonomy
Remember the key clinical features, diagnostic criteria, and treatment options for common neurological disorders.	Remember
Understand the pharmacological and non-pharmacological treatment approaches used in neurology medicine.	Understand
Apply knowledge of clinical neurology to diagnose and manage patients with neurological disorder	Apply
Analyze clinical presentations, diagnostic test results, and imaging findings to differentiate between different neurological disorders.	Analyze
Evaluate the outcomes and effectiveness of treatment interventions in patients with neurological disorders.	Evaluate
Create comprehensive care plans for patients with complex neurological conditions, integrating various treatment modalities.	Create

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

Learning Outcomes:	6. Interpret clinical presentations, diagnostic tests, and imaging findings to diagnose neurological disorders accurately. 7. Apply appropriate treatment strategies for managing and treating various neurological conditions. 8. Analyze the effectiveness and outcomes of treatment interventions in patients with neurological disorders. 9. Evaluate research studies and literature to inform evidence-based practice in neurology medicine. 10. Create comprehensive care plans that integrate various treatment modalities for patients with complex neurological conditions.
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Unit 1

- Drugs used in Viral encephalitis
- Drugs used in Neuromuscular Junction Disorders

Unit 2

- Drugs used in Demyelinating disorder
- Drugs used in Cerebral vascular diseases

Reference books:

1. Clinical Neurology Made Easy – by HV Srinivas

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Immunology

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

Course Outcomes

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

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

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

Learning Objectives	<ol style="list-style-type: none"> 1. Understand the basic principles of immunology, including the immune system's components and their functions. 2. Explain the mechanisms of immune responses and how they protect the body against pathogens. 3. Describe the types of immunity, including innate and adaptive immunity, and their roles in disease prevention. 4. Recognize the importance of immunization and its impact on public health.
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Unit 1

- History and introduction to immunology
- Immunity
- Innate
- Acquired immunity
- Basic concepts about their mechanisms
- Definition, types of antigens and determinants of antigenicity
- Definition, types, structure and properties of immunoglobulin
- Antigen-Antibody reactions
 - Definition
 - Classification
 - General features and mechanisms
 - Applications of various antigen antibody reactions

Unit 2

- Principle, procedure and applications of under mentioned in Medical Microbiology:
 - Complement fixation test
 - Immuno- fluorescence
 - ELISA
 - SDS-PAGE
 - Western blotting
- Principle, procedure and interpretation of various serological tests:
 - Widal
 - VDRL
 - ASO
 - CRP
 - Brucella tube agglutination
 - Rose-Waaler

Unit 3

- Complement system:
 - Definition
 - Basic concepts about its components
 - Complement activation pathways



Unit 4

- Immune response:
 - Introduction
 - Basic concepts of Humoral and Cellular immune responses

Unit 5

- Hypersensitivity:
 - Definition
 - Types of hypersensitivity reactions
- Basic concepts of autoimmunity and brief knowledge about autoimmune diseases
- Automation in diagnostic serology
- Vaccines:
 - Definition
 - Types
 - Vaccination schedule
 - Brief knowledge about 'Extended programme of immunization' (EPI) in India

Suggested Readings:

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

Discipline specific elective



MEDICAL PSYCHOLOGY

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Discipline specific elective	Medical Psychology	2	2	-	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
This course covers various aspects of medical psychology.	Receive
Understand different aspects of medical psychology essential in medical professional.	Respond
Apply medical psychology in clinical scenarios during clinical postings.	Value
Use of scientific methods for assessment.	Organize
Identify behaviors & experiences that promote health	Characterize
Follow the skills adapting changes in vision	Receive

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes	<ol style="list-style-type: none"> 1. Cognitive thinking 2. Demonstrate skills in communication. 3. Ethical behaviour
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UNIT-I

Introduction to psychology

Intelligence, Learning, Memory, Personality, Motivation

UNIT-II

Body integrity- one's body image

Patient in his Milan

UNIT-III

Self-concept of the therapist, Therapist patient relationship-some guidelines

Illness and its impact on the patients.

UNIT-IV

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

UNIT-V

Adapting changes in vision

Why Medical Psychology needs / demands commitment?

Reference book:

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



BIostatISTICS & RESEARCH METHODOLOGY

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none"> To understand the importance & Methodology for research To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.
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UNIT-I

Introduction to research methods.
Sampling methods

UNIT-II

Identifying research problem
Developing a research proposal

UNIT-III

Ethical issues in research

UNIT-IV

Research design
Types of Data

UNIT-V

Basic Concepts of Biostatistics
Research tools and Data collection methods

Reference books:

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



Ability Enhancement Course

ENTERPRENEURSHIP DEVELOPMENT

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes	<ol style="list-style-type: none"> 1. Develop awareness about entrepreneurship and successful entrepreneurs. 2. Develop an entrepreneurial mind-set by learning key skills such as design, personal selling, and communication. 3. Understand the DNA of an entrepreneur and assess their strengths and weaknesses from an 4. Entrepreneurial perspective.
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UNIT-I

Introduction to Entrepreneurship

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

UNIT-II

The Entrepreneur

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

UNIT-III

E-Cell

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

UNIT-IV

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

UNIT V

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

Reference Books:

- 1: Title Entrepreneurial Development Author S S Khanka Edition reprint Publisher S. Chand Publishing, 2006
- 2: Entrepreneurship Development and Business Ethics Paperback – 1 January 2019 by Abhik Kumar Mukherjee and Shaunak Roy Author
- 3: Margie Lovett Scott, Faith Prather. Global health systems comparing strategies for delivering health services. Joney & Bartlett learning, 2014
- 4: Taxmann's Entrepreneurship development – CA (Dr.) Abha Mathur- 2021.



INTRODUCTION TO QUALITY & PATIENT SAFETY

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

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	Use healthcare data and analytics to measure healthcare quality and patient safety and plan improvement measures. Participate in research projects that can lead to quality improvement, risk reduction and enhanced patient safety within the healthcare system.
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UNIT-I

Quality assurance and management – Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Introduction to NABH guidelines

UNIT-II

Basics of emergency care and life support skills- Basic life support (BLS), Vitals signs and primary assessment, Basic emergency care – first aid and triage, Ventilations Including use of bag-valve-masks (BVMs), Choking, rescue breathing methods, One- and Two-rescuer CPR

UNIT-III

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

UNIT-IV

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

UNIT V

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

Reference books:

1. Handbook of healthcare quality & patient safety- Girdhar J Gyani & Alexander Thomas – 2nd edition- 2017
2. Total quality management in the healthcare industry: An efficient guide for healthcare management- Balasubramanian Mahadevan – 2022
3. Step by step Quality Hospital Care- Farooq Jan- 1st edition – 2013
4. Patient safety and healthcare improvement Willey Blackwell- 1st edition - 2014



SEMESTER 6

Recent Advances in EEG and EEG Changes in Clinical Conditions

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Recent Advances in EEG and EEG Changes in Clinical Conditions	4	3	1	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
Recall the basic principles and techniques of EEG recording and interpretation.	Remember
Understand the various abnormalities and changes seen in EEG recordings related to different clinical conditions.	Understand
Apply knowledge of EEG techniques to correctly perform and record EEGs in clinical settings.	Apply
Analyse EEG recordings to interpret the findings and identify abnormalities or changes associated with specific clinical conditions.	Analyze
Evaluate the effectiveness and limitations of recent advances in EEG technology for diagnosing and monitoring clinical conditions.	Evaluate
Create comprehensive EEG reports that effectively communicate findings, interpretations, and recommendations.	Create

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

Learning Outcome	<ol style="list-style-type: none">1. Understand recent advances in EEG technology and their application in clinical diagnosis and monitoring.2. Identify and interpret abnormal EEG patterns associated with various neurological and psychiatric conditions.3. Apply knowledge of EEG changes to assist in the diagnosis and treatment planning of clinical conditions.4. Analyze EEG recordings to correlate findings with clinical symptoms and aid in patient management.5. Evaluate the impact of recent advances in EEG on improving diagnostic accuracy and patient outcomes.
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UNIT 1

- Basic principles of EEG recording and interpretation
- Electrode placement and montage techniques
- Normal EEG patterns and terminology
- High-density EEG and its applications

UNIT 2

- Source localization techniques and brain mapping
- Advanced EEG analysis methods, such as quantitative EEG (qEEG) and event-related potentials (ERPs)
- EEG in functional brain imaging (EEG-fMRI, EEG-TMS)

Reference books:

1. Clinical Neurology Made Easy – by HV Srinivas
2. Clinical Electroencephalography- by MisraUK
3. Current Practice of Clinical Electroencephalography- by John S. Ebersole

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Recent Advances in EEG, Intraoperative EEG, Polysomnography

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

Course Outcomes

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

CO Statement	Taxonomy
Remember the terminology and basic concepts related to EEG interpretation and sleep medicine.	Remember
Understand the principles and applications of intraoperative EEG monitoring and its role in neurosurgical procedures.	Understand
Apply knowledge of recent advances in EEG technology to interpret EEG recordings and identify abnormal patterns.	Apply
Analyze EEG recordings and identify abnormalities or specific patterns associated with different neurological conditions.	Analyze
Evaluate the efficacy and limitations of recent advances in EEG technology for clinical applications.	Evaluate
Develop comprehensive EEG reports that effectively communicate findings, interpretations, and recommendations.	Create

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

Learning Outcome	<ol style="list-style-type: none"> 1. Understand recent advancements in EEG technology, including high-density EEG and advanced analysis methods. 2. Apply knowledge of intraoperative EEG techniques to monitor brain activity during surgical procedures. 3. Analyze EEG recordings to identify abnormal patterns and interpret brain activity in different clinical contexts. 4. Evaluate the benefits and limitations of recent advances in EEG for clinical applications and research. 5. Demonstrate proficiency in utilizing intraoperative EEG technology and techniques for improved surgical outcomes.
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Unit 1

Intraoperative EEG (IOEEG):

- Principles and techniques of IOEEG monitoring during surgery
- Indications and applications of IOEEG in neurosurgical procedures
- Interpretation of IOEEG patterns and identification of critical events

Unit 2

- Introduction to sleep medicine and the role of PSG
- PSG instrumentation and recording techniques
- Sleep stage scoring and analysis of sleep architecture
- Interpretation of PSG findings in sleep disorders

Unit 3

- EEG in cognitive neuroscience research
- Application of EEG in neurorehabilitation and brain-computer interfaces
- Emerging trends and technologies in EEG, IOEEG, and PSG

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Epilepsy Surgery, Intra Operative Brain and Spinal Cord Monitoring

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Epilepsy Surgery, Intra Operative Brain and Spinal Cord Monitoring	4	3	1	-	20	80	100

Course Outcomes

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

CO Statement	Taxonomy
Recall the fundamental concepts and principles of epilepsy surgery, intraoperative brain monitoring, and spinal cord monitoring.	Remember
Understand the principles and techniques of intraoperative brain monitoring and spinal cord monitoring.	Understand
Apply knowledge of epilepsy surgery and intraoperative monitoring to assess patient eligibility for surgical intervention.	Apply
Analyze intraoperative monitoring data, including electrocorticography and evoked potentials, to assess neural function and guide surgical decision-making.	Analyze
Evaluate the effectiveness of epilepsy surgery and the impact of intraoperative monitoring on surgical outcomes and patient well-being.	Evaluate
Create comprehensive surgical plans that integrate epilepsy surgery techniques and intraoperative monitoring strategies.	Create

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

Learning Outcome	
	<ol style="list-style-type: none"> 1. Understand the principles and techniques of epilepsy surgery and intraoperative brain and spinal cord monitoring. 2. Apply appropriate monitoring techniques to ensure patient safety and optimize surgical outcomes. 3. Analyze intraoperative monitoring data to guide surgical decision-making and assess neural function. 4. Evaluate the effectiveness of epilepsy surgery and the impact of intraoperative monitoring on surgical outcomes. 5. Create comprehensive surgical plans that integrate epilepsy surgery techniques and intraoperative monitoring strategies.



Unit 1

- Epilepsy surgery-
 - Prolonged telemetry EEG
 - Recording ictal period and reporting pre/ictal/postal phases
 - Intraoperative recording—(Cardiogram)

Unit 2

- Intraoperative Brain Monitoring:
 - Introduction to intraoperative brain monitoring techniques
 - Electrocorticography (ECoG) and its role in epilepsy surgery
 - Intraoperative mapping of functional areas using electrical stimulation

Unit 3

- Intraoperative Spinal Cord Monitoring:
 - Principles and techniques of intraoperative spinal cord monitoring
 - Somatosensory evoked potentials (SSEPs) and motor evoked potentials (MEPs)
 - Monitoring spinal cord integrity during complex spine surgeries

Unit 4

- Anesthesia Considerations:
 - Anesthetic management for epilepsy surgery
 - Impact of anesthetics on intraoperative brain and spinal cord monitoring

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Professionalism and values

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

Course Outcomes

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

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

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

Learning Outcome	<p>On completion of this course, the students will be able to do the following:</p> <ol style="list-style-type: none"> Understand the importance of professionalism and ethical behavior in the workplace. <p>Demonstrate professionalism through effective communication, punctuality, and respect for colleagues and clients.</p> <p>Apply ethical principles and values to make informed decisions and solve problems.</p> <p>Foster a positive work environment by upholding professional standards and promoting integrity and trust.</p>
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UNIT I

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

UNIT II

Personal values – ethical or moral values

UNIT III

Attitude and behavior – professional behavior, treating people equally

UNIT IV

Code of conduct, professional accountability and responsibility, misconduct

UNIT V

Differences between professions and importance of team efforts

Cultural issues in the healthcare environment

Suggested Readings

1. R. R. Gaur, R. Sangal, G.P. Bagaria, 2009, a Foundation Course in Value Education.
2. E.F. Schumacher, 1973, Small is Beautiful: A study of Economics as if people mattered, Blond & Briggs, Britain.
3. A. Nagraj, 1998, Jeevan VidyaekParichay, Divya Path Sansthan, Amarkantak.
4. P.L.Dhar, R.R.Gaur, 1990, Science and Humanism, Common wealth Publishers.
5. A.N. Tripathy, 2003, Human Values, New Age International Publishers
6. E G Seebauer& Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press
7. B. P. Banerjee, 2005, Foundations of Ethics and Management, Excel Books.



Clinical Posting

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

45 Days of clinical posting is mandatory

 W. Abue

Blood Banking Documentation & Quality Control

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Core	Blood Banking Documentation & Quality Control	1	-	-	2	20	80	100

Course Outcomes

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

	CO Statement	Taxonomy
	Describes the basic importance of medical terms into their component parts..	Remember
	Analyze and spell words correctly.	Understand
	Identify combining forms, prefixes, suffixes and terminology associated with each of the body systems.	Apply
	Understand the importance and types of medical records for blood banking along with its management	Analyze
	Revise to compose records in hospitals	Evaluate
	Follow the values and skills required in medical audit	Create

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

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

Learning Outcomes:	1. Ensuring successful learning of basic and advance medical terminology 2. Student will able to read, write, spell and understand the medical terminology 3. Understand the types, importance and role of medical records and its management techniques.
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Practical:

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

Reference book:

- "Technical Manual" by AABB (formerly known as the American Association of Blood Banks)
- "Transfusion Medicine and Hemostasis: Clinical and Laboratory Aspects" by Christopher D. Hillyer, Leslie E. Silberstein, et al.
- "Handbook of Transfusion Medicine" by Christopher Hillyer, Beth H. Shaz, et al.
- "Practical Guide to Transfusion Medicine" by Michael F. Murphy and Derwood H. Pamphilon
- "Essentials of Blood Banking: A Handbook for Students of Blood Banking and Clinical Residents" by John D. Roback, Edward L. Snyder, et al.
- "Blood Banking and Transfusion Medicine: Basic Principles and Practice" by Christopher D. Hillyer, Beth H. Shaz, et al.

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Apheresis Technique & Therapeutic Procedures

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Practical	Apheresis Technique & Therapeutic Procedures	1	-	-	2	40	60	100

Course Outcomes

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

CO Statement	Taxonomy
Recall the principles and techniques of apheresis procedures for therapeutic purposes.	Remember
Understand the mechanisms and physiological basis of apheresis techniques.	Understand
Apply appropriate apheresis techniques for the selective removal or collection of specific blood components.	Apply
Analyse patient indications and laboratory results to determine the need for apheresis procedures.	Analyze
Evaluate the appropriateness of apheresis as a treatment modality for specific medical conditions.	Evaluate
Develop treatment plans and protocols for apheresis procedures in various clinical conditions.	Create

Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, create.

Learning Outcome	<ol style="list-style-type: none"> 1. Understand the principles and techniques of apheresis procedures for therapeutic purposes. 2. Apply appropriate apheresis techniques for the selective removal or collection of specific blood components. 3. Analyze patient indications and contraindications for apheresis procedures to ensure safe and effective treatment. 4. Evaluate the outcomes and potential complications of apheresis procedures. 5. Create treatment plans and protocols for apheresis procedures in various clinical conditions.
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HOSPITAL MANAGEMENT/ Basics of clinical Skill Learning

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Discipline Specific Elective	HOSPITAL MANAGEMENT/ Basics of clinical Skill Learning	3	3	-		20	80	100

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Objective	<ol style="list-style-type: none"> To provide an environment that enables students to benefit and learn nuances of Hospital Management from their collective learning experiences. To offer opportunities to develop the ability to think analytically and build capacity for independent learning.
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UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

Reference books:

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



BASICS OF CLINICAL SKILL LEARNING

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none">1. To Understand and the basic ideas on how to check for Vital Signs of the Patient2. They will also learn on the Basics of Nasal-Gastric Tube.3. This course the student will learn how to handle the patients and their positioning
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UNIT- I

MEASURING VITAL SIGNS: Temperature: Axillaries Temperature, Pulse: Sites of pulse, Measurement, Respiratory, Blood Pressure, Pain: Pain Scale

UNIT- II

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

UNIT- III

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

UNIT- IV

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

UNIT- V

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

Reference books:

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



BASIC AND ADVANCE LIFE SUPPORT/ ORGANIZATIONAL BEHAVIOUR

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	Skill Enhancement Course	BASIC AND ADVANCE LIFE SUPPORT/ ORGANIZATIONAL BEHAVIOUR	2	2			20	80	100

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcomes	<ol style="list-style-type: none"> 1. Recognize the need to commence Cardiopulmonary Resuscitation (CPR) 2. Assess a casualty's level of consciousness
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UNIT- I

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

UNIT- II

- **Diagnosis, treatment modalities of:**
 - Vascular system
- Heart Congenital and acquired - Rheumatic Heart diseases

UNIT- III

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

Drugs used in treatment of blood and cardio vascular disorders

UNIT- IV

Basic Life Support

- Airway Management
- Anaphylaxis
- Approach to Shock

Initial Management of Shock

UNIT- V

Basic Life Support

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

Reference books:

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



ORGANIZATIONAL BEHAVIOUR

Course Outcomes

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

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

Taxonomy: Receive, Respond, Value, Organize, Characterize

Learning Outcome	<ol style="list-style-type: none">1. To analyze and compare different models used to explain individual behaviour related to motivation and rewards.2. To identify the processes used in developing communication and resolving conflicts. to explain group dynamics and demonstrate skills required for working in groups (team building)
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UNIT-I

Organizational Behavior-Definition-Importance -Historical Background-Fundamental concepts of OB- 21st Century corporate-Different models of OB i.e. autocratic, custodial, Supportive

UNIT-II

Organization Structure and Design- Authority and Responsibility Relationships - Delegation of Authority and Decentralization-Interdepartmental Coordination-Emerging Trends in Corporate Structure, Strategy and Culture - Impact of Technology on Organizational design- Mechanistic vs Adoptive Structures – Formal and Informal Organization

UNIT-III

Perception Process - Nature & Importance - Perceptual Selectivity - Perceptual Organization - Social Perception - Impression Management. Learning-Processes of Learning-Principles of Learning- Organizational Reward Systems – Behavioral Management

UNIT-IV

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

UNIT V

Leadership - Definition - Importance -Leadership Styles - Models and Theories of Leadership Styles. **Conflict Management** -Traditional vis-a-vis Modern view of conflict - Constructive and Destructive conflict - Conflict Process - Strategies for encouraging constructive conflict - Strategies for resolving destructive conflict

Reference Books:

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



Generic Elective

Course Code	Course Category	Paper Title	Credits	Contact per week			Evaluation		
				L	T	P	Internal	External	Total
	*Generic Elective	*Students have to opt any one of the open elective courses offered by Institute/ College/University.	2	2			20	80	100




Semester 7& 8

SEMESTER – VII & VIII INTERNSHIP				
Subject Code	Course category	Course title	Evaluation	
			Internal	External
	Core	Internship	20	80
	Core	Internship	20	80
Internship is for 12 months,				
SEMESTER		CREDIT		
I		25		
II		25		
III		27		
IV		28		
V		28		
VI		28		
VII		20		
VIII		20		
TOTALCREDITS		201		

Guidelines:

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

Evaluation of Internees:

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

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

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

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