



## DIPLOMA IN OPERATION THEATER TECHNOLOGY – DOTT10

Eligibility	:	10 <sup>th</sup>
Programme Duration	:	3 Years
Programme Objectives	:	The operating theatre (OT) technician is an integral person in the dynamic operating theatre team. The success of the procedures and safety of patients depends largely on the reliability of the OT technician. This course will provide you with the technical and interpersonal skills required to work under the supervision of nursing, anesthetists and surgical personnel
Job Prospects	:	After the completion of DOTT, you will find a challenging career in a hospital, emergency centers, private laboratory, doctor's office or clinics. Common job profiles of students after completing DOTT include: Technician in Hospitals, Nursing Homes and Trauma Centers

**YEAR I**

Course Code	Course Title	Theory/ Practical	Continues Assessment (Internals)	Credits
THEORY	Communication For Professionals	70	30	4
THEORY	Basic Human Anatomy & Physiology	70	30	5
THEORY	Basic Biochemistry	70	30	5
THEORY	Basic Microbiology	70	30	5
THEORY	Basic obstetrics and Gynecology	70	30	5
PRACTICAL	Basic Microbiology	35	15	1
PRACTICAL	Basic Human Anatomy & Physiology	35	15	1
PRACTICAL	O.T. Instrument Care & Maintenance	35	15	1
PRACTICAL	Hospital Training	200		1
			<b>Total</b>	<b>28</b>

**YEAR II**

Course Code	Course Title	Theory/ Practical	Continues Assessment (Internals)	Credits
THEORY	Fundamentals of Computer Science	70	30	4
THEORY	Basic Surgery	70	30	5
THEORY	Basic Anesthesia Equipment & Drugs	70	30	5
THEORY	Surgical Equipments & Machinery	70	30	5
THEORY	Post Anesthesia Care Unit (PACU)	70	30	5
PRACTICAL	Basic Surgery	35	15	1
PRACTICAL	Clinical Practical Training-O.T.	35	15	1
PRACTICAL	O.T Instrument Care & Maintenance	35	15	1
PRACTICAL	Hospital Training	200		1
			<b>TOTAL</b>	<b>28</b>

**YEAR III**

<b>Course Code</b>	<b>Course Title</b>	<b>Theory/ Practical</b>	<b>Continues Assessment (Internals)</b>	<b>Credits</b>
THEORY	Environmental & Bio Medical Waste Management	70	30	4
THEORY	Basic Surgery , Surgical Equipments & Machinery	70	30	5
THEORY	Basic Anesthesia Technology	70	30	5
THEORY	Advanced Anesthesia Technology	70	30	5
THEORY	Applied Anesthesia technology	70	30	5
PRACTICAL	Basic Surgery , Surgical Equipments & Machinery	35	15	1
PRACTICAL	Advanced Anesthesia Technology	35	15	1
PRACTICAL	Applied Anesthesia Technology	35	15	1
PRACTICAL	Hospital Training	200		1
			<b>TOTAL</b>	<b>28</b>

## DETAILED SYLLABUS

**INSTRUCTIONAL METHOD:** Personal contact programmes, Lectures (virtual and in-person), Assignments, Labs and Discussions, Learning projects, Industrial Training Programmes and Dissertation.

### YEAR I

### COMMUNICATION FOR PROFESSIONALS

UNIT	CONTENTS
1.	Parts of speech - (definition of all the sight parts along with examples and their use in language), definite and indefinite articles (a. an and the), definition and its uses along with examples and personal, reflexive, emphatic, demonstrative, relative, indefinite, interrogative and distributive pronouns, the noun (defining noun along with types and categories), gender, number case, the adjective, comparison, adjective used as nouns, positions of the adjective and its correct use of adjectives, the verb definition. its forms, verbs of incomplete predication, phrases (defining it along with examples), adjective, adverb and noun phrase and clauses (defining it along with examples), adverb, adjective and noun clauses, the sentence and its types, simple, compound and complex, subject and predicate (parts of a sentence), transformation of sentences, active and passive voice, mood and narration (direct and indirect speeches).
2.	Words and phrases - word formation (prefix, suffix), idioms, synonyms and antonyms, phonetics, speech sound, the phoneme, the syllable and IPA transcription.
3.	Business correspondence, paragraph writing, introductory remarks, principles, the writing of single paragraphs and precise writing, letter writing, quotations, orders and tenders, inviting and sending quotations, placing orders and inviting tenders.
4.	Notices, agenda and minutes, application letter, importance and function, drafting the application, elements structure, preparing cvs.
5.	Applied grammar - correct usage, the structure of sentences, the structure of paragraphs, enlargements of vocabulary.
6.	Written composition, precise writing and summarizing, writing of bibliography, enlargement of vocabulary.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. English Grammar and Composition Wren and Martin. S. Chand & Company Ltd.
- B. Intermediate English Grammar; Raymond Murphy Pub: Foundation Books, New Delhi
- C. Eng. Grammar usage and Composition; Tickoo & Subramanian Pub: S. Chand and Co.
- D. Living Eng. Structure; Standard Alien.

## **BASIC HUMAN ANATOMY & PHYSIOLOGY**

UNIT	CONTENTS
1.	The Human Body - Definitions, sub-divisions of Anatomy, Terms of location and position, fundamental planes, vertebrate structure of man, organization of the body cells, Tissues.
2.	The Skeletal System - Types of bones, structure and growth of bones, Division of the skeleton Appendicle skeleton, axial skeleton name of all the bones and their parts. Joints classification, types of movements with examples.
3.	Anatomy of Circulatory System - Heart Size, position coverings, chambers, Blood supply, never supply, the blood vessels, general plan of circulation, pulmonary circulation, Names of arteries and veins and their position - lymphatic system general plan.
4.	Anatomy of the respiratory System - Organs of respiratory, Larynx, trachea, bronchial tree, Respiratory portion, Pleurae and lungs, Brief knowledge of parts and position.
5.	Anatomy of the Digestive System - Components of digestive system, Alimentary tube, anatomy of organs of digestive tube, mouth, tongue, tooth, salivary glands, liver, biliary apparatus, pancreas, names and position and brief functions.
6.	Anatomy of the Nervous System - Central nervous system, The Brain, hind brain, midbrain, forebrain, brief structure, locations, and peripheral nervous system, Spinal cord, Anatomy, functions, reflex – Arc, ménages. Injuries to spinal cord and brain.
7.	Anatomy of the endocrine system - Name of all endocrine glands their position, hormones, and their functions– pituitary, thyroid, parathyroid, adrenal glands, gonads & islets of pancreas.
8.	Anatomy of Excretory system and reproductive system - Kidneys location, gross structure, excretory ducts, urethras, urinary bladder, urethra, Male reproductive system, Testis, duct system, Female reproductive system, Ovaries Duct system, accessory organs.
9.	Blood - Definitions, composition, properties and function of Blood, Haemogram (RBC, WBC, Platelet count, HB concentrations), Function of plasma proteins Haemopoiesis, Blood Group – ABO and RH grouping, Coagulation & Anticoagulants, Anemia causes effects & treatment, Body fluid compartments, composition, Immunity Lymphoid tissue, Clotting factors, mechanism of blood clotting, Disorders of white blood cells, Disorders of platelets, Disorders of clotting.
10.	Cardio vascular system - Function of cardiovascular system, Structure of cardiovascular system, Cardiac cycle, functional tissue of heart & their function, Cardiac output, E.C.G., blood pressure, Heart Rate.
11.	Respiratory system - Function of respiratory system, functional (physiological), Anatomy of Respiratory system, Mechanism of respiration, lung volumes & capacities, Transport of respiratory gases.
12.	Digestive system - Function of digestive system, functional Anatomy of digestive system, composition and functions of all digestive juices, Movements of digestive system (intestine), Digestion & absorption of carbohydrate, proteins & fats.
13.	Muscle Nerve Physiology - Type of muscle, structure of skeletal muscle, Sarcomere, Neuromuscular junction & transmission, Excitation and contraction coupling (mechanism of contraction).
14.	Structure and function of skin - body temperature, fever, regulation of temperature.
15.	Excretory system - Excretory organs, kidneys, function, Nephron, Juxta Glomerular apparatus, renal circulation, mechanism of urine formation, mechanism of micturition, cystometrogram, diuretics, artificial kidney.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Text books of Physiology. Author : Guyton (Arthor C). Prism publishers Bangalore.
- B. Human Physiology. Author : Chaterjee (cc). Medical allied agency
- C. Concise Medical physiology. Author : Choudhary (Sujit km.). New central books Kolkata.
- D. Review Medical physiology. Author : Ganang. Application and Lange.

**BASIC BIOCHEMISTRY**

UNIT	CONTENTS
1.	Introduction to medical lab technology - General introduction role of medical lab technologist's ethics, responsibility safety measures and first aid, Cleaning and care of general laboratory glassware and equipments.
2.	Distilled water - Types of distilled water plants preparation & storages.
3.	Analytical balance - principle & maintenance, preparation of reagents.
4.	Standard Solutions - Various std, solutions used their preparation & storage of chemicals.
5.	Units of measurements - S.I. units, Definitions conversions, Measurement of volume, Strength Normality.
6.	Molarity, Molality: volumetric apparatus calibration of volumetric apparatus.
7.	Carbohydrate - Definition, classification, functions, properties and osazone formation.
8.	Proteins and amino acids - Definition, classification, functions and chemical reactions.
9.	Nucleic acids - Definition, types and functions.
10.	Lipids - Definition, Classification, function of lipids and lipoproteins.
11.	Enzyme - Definition, classification, factors affecting enzyme action, inhibition Diagnostic importance of enzymes and isoenzymes.
12.	Carbohydrate metabolism - Definition and importance of Glycolysis, Glycogenesis, Glycogenolysis, Gluconeogenesis, Kreb's cycle, Cori;s Cycle.
13.	Blood glucose regulation - glycosuria, glucose tolerance tests, protein metabolism.
14.	Deamination and Transamination and Urea formation.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**BASIC MICROBIOLOGY**

UNIT	CONTENTS
1.	Introduction and Brief History of microbiology - Definition History and relationship of

	micro org. to man Safety measures in microbiology.
2.	Culture media - Preparation of various media, Standardization and use Sterilization, Definition, Different methods and principles-Moist heat dry heat Radiation & filtration, Autoclave-its structure functioning control & indicators .
3.	Antiseptics and disinfectants - Definition types, mode of action & properties, uses of disinfectant & antiseptics, testing efficiency.
4.	Glassware - Description of glassware its use handling and care.
5.	Principle of Grams & AFB staining,
6.	Aerobic and anaerobic culture methods.
7.	General characters and nature of antigen and antibody, Principle of antigen antibody reaction.
8.	Collection transportation and processing of clinical samples for microbiological investigations.
9.	Laboratory organization management recording of results and quality control in microbiology.
10.	Introduction to virology, physiochemical characteristics of viruses.
11.	General characters and classification of protozoa of medical importance.
12.	Systemic microbiology - identification of bacteria micrococci, staphylococci, pneumococci, corynebacteria, Escherichia coli, klebsiella, enterobacter, proteus, providencia salmonella, shigella, Arizona, citrobacter, Yesinia, pseudomonas, vibrio cholera, haemophilus, mycobacteria, buccella, bordetella, bacillus, clostridia, anaerobic cocci, neisseria, treponema, borrelia leptospria, mycoplasma, rickettsia, Chlamydia, tric agents.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

## **BASIC OBSTETRIC AND GYNAECOLOGY**

UNIT	CONTENTS
1.	Pregnancy - Normal delivery forceps delivery twin pregnancy, Episiotomy caesarian delivery, Birth control methods and contraception, Medical termination of pregnancy.
2.	Anatomy of female sex organs - Gynecological examination and diagnosis.
3.	Disease of vulva disease of vagina STD in female, Disorders of menstruation.
4.	Prolapsed uterus Fibromyomas of uterus endometriosis various ovarian tumors.
5.	Gynae examination instruments speculum & dilator.
6.	Instrument of common gynecological and obstetrics procedures or surgery.

**LEARNING SOURCE:** Self Learning Materials.

**ADDITIONAL READINGS:**

- A. Reading 1 .....



B. Reading 2.....

## **BASIC MICROBIOLOGY– (P)**

UNIT	CONTENTS
1.	Compound Microscope.
2.	Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters.
3.	Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar,
4.	Chocolate agar, Macconkey medium, LJ media, Robertson Cooked meat media, Potassium Telluride media with growth, Macconkey medium with LF & NLF, NA with staph.
5.	Antibiotic susceptibility test
6.	Demonstration of common serological tests – Widal, VRDL, ELISA.
7.	Grams staining
8.	Acid Fast staining
9.	Stool exam for Helminthes ova
10.	Visit to hospital for demonstration of biomedical waste management.
11.	Anaerobic culture methods.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

## **BASIC HUMAN ANATOMY & PHYSIOLOGY-(P)**

UNIT	CONTENTS
1	Practical's related to anatomy & physiology such as knowledge of surface anatomy of human body, Identification of bones and parts on x-ray film as radiological anatomy.
2	Preparing of charts of human all systems & structures of human body, Identification and knowledge of pathological specimens, Visit of anatomy & pathology museum.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Text books of Anatomy. Author: Guyton (Arthor C). Prism publishers Bangalore.
- B. Human Physiology. Author: Chaterjee (cc). Medical allied agency

## **O.T. INSTRUMENT CARE & MAINTENANCE - (P)**

<b>UNIT</b>	<b>CONTENTS</b>
1.	Identification & Demonstration of working of the equipment, Fumigation, Cleaning and disinfection of articles, Packing articles for sterilization, Sterilization of equipments, Care Sterilization & lubrication of Orthopedic Power instrument, Setting up table for various surgeries, Scrubbing gloving & gowning.
2.	Handling of image intensifier & portable X-ray Machine Cautery Machine Types Setting & Uses, Positing for orthopedic patient and other surgeries, Advanced O.T. Table & Their attachment as well as their maintenance, Assisting with Anesthesiologist, Observing and monitoring the patient in recovery room, Terminal disinfection.

**LEARNING SOURCE:** Self Learning Materials.

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

## **HOSPITAL TRAINING (FOR 45 DAYS) AFTER THE FINAL EXAMINATION**

### **YEAR II**

## **FUNDAMENTALS OF COMPUTER SCIENCE**

<b>UNIT</b>	<b>CONTENTS</b>
1.	Computer Application - Characteristic of computers, Input, output, storage units, CPU, Computers system.
2.	Computers Organization - Central Processing Unit, Control Unit, Arithmetic Unit, Instruction Set, Register, Processor Speed.
3.	Memory - Main Memory, Storage Evaluation Criteria, Memory Organization, Memory Capacity, Random Access Memories, Read Only Memory, Secondary Storage Devices, Magnetic Disk, Floppy and Hard Disk, Optical Disks CD-ROM, Mass Storages Devices.
4.	Input Devices - Keyboard, Mouse, Trackball, Joystick, Scanner, Optical Mark Reader, Bar-code reader, Magnetic ink character reader, Digitizer, Card reader, Voice recognition, Web cam, Video Cameras.

5.	Output Devices - Monitors, Printers, Dot Matrix Printers, Inkjet Printers, Laser Printers, Plotters, Computers Output Micro Files (Com), Multimedia Projector.
6.	Operating System - Microsoft Windows, An overview of different version of windows, Basic windows elements, File managements through windows, Using essential accessories: system tools Disk cleanup Disk defragmenter, Entertainments, Games, Calculator, Imagine-Fax, Notepad, paint, Word Pad, Recycle bin, windows Explorer, Creating folders icons.
7.	Word Processing - Word processing concepts, Saving, closing opening and existing documents, Selecting text, edition text, Finding and replacing text, Printing documents, Creating and printing merged documents, Mail merge, Character and paragraph formatting, page designs and layout, Editing and proofing tools checking and correcting spelling, Handling graphics, Creating tables and charts, Documents templates and wizards.
8.	Presentation Package - Creating opening and saving presentations, Creating the look of your presentation, Working in different views working with slides, Adding and formatting text, formatting paragraphs, Checking spelling and correcting typing mistakes, Making notes pages and handouts, Drawing and working with objectives, Adding clip art and other pictures, Designing slides shows, Running and controlling a slid show, Printing Presentations.
9.	Use of Internet and Email, Internet, Websites (Internet Sites), The Mail protocol suite.
10.	Hospital Management system - Types and Uses, Hospital Management & System Package, Advanced Hospital Management System, X O Hospital Management System, LCS Hospital Management Information System, NVISH Hospital Management System, CSPM-Hospital Management System.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Foundations of computing first edition, 2002 : P.K. Sinha and P. Sinha.
- B. Microsoft office 2000 for window, second Indian Print, person education S. Sagman.

## **BASIC SURGERY**

UNIT	CONTENTS
1	Introduction of surgery and basic principles of surgery.
2	Tumors benign and malignant cyst ulcers sinuses fistula differential diagnosis of cyst and tumor.

3	Fractures and Dislocation - Classification of fracture management, fixation reduction immobilization principles of closed reduction artificial prosthesis.
4	Comparative and Surgical Anatomy - Investigating of breast benign disease, carcinoma of breasts, treatment of carcinoma of breast mastectomy.
5	Head Injury - Common manifestation management of patient surgical interventions.
6	Cleft lip & palate acute appendicitis urethral strictures.
7	Different Surgical Instrument - Instruments used in major surgical operation including Biliary Tract Surgery, Anorectic Surgery, Urological Surgery, Orthopedic Surgery Instruments, Obstetrics and Gynecological Surgery instruments, Plastic Surgery Instruments.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

### **BASIC ANESTHESIA EQUIPMENT & DRUGS**

UNIT	CONTENTS
1.	Boyle Machine & Its functioning.
2.	Boyle Vaporizer
3.	Magill's breathing circuit Bains breathing circuit pediatric anaesthesia circuit
4.	Gas cylinder and flow meters, Carbon dioxide absorber.
5.	Suction apparatus-foot operated electrically operated, Ambubag laryngoscope hand tracheal tubes; Catheters face masks ventimask drugs.
6.	General Principles, Pharmacological classification of drugs Route of drug administration precautions in administration principles of drug toxicity prevention and treatment of poisoning adverse drug reaction.
7.	Sedatives & Hypnotics, Barbiturates morphine and others.
8.	Important groups of drugs, NS and other IV fluids ibuprofen, aspirin, antimicrobial agents ant allergic drugs ant diuretics.
9.	Pre-anesthetic medication.
10.	Local Anesthetic agents.
11.	Spinal Anesthetic agents.

12.	General Anesthetic agents.
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**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

### **SURGICAL EQUIPMENTS AND MACHINERY**

UNIT	CONTENTS
1	Storing Sterilization and disinfections in O.T.
2	General Surgical Principles and Instruments, The surgical patient operation room technique
3	Instrument used for preparing Surgical Cheatles forceps rampleys sponge holding foeceps mayo's towel clip esmarch bandage simple tourniquet Pneumatic tourinquet
4	Incision making method and instruments, Bard parker knife handles major abdominal incision artery forceps and their types instruments used in homeostasis Kocher's forcesp electric cautery Retractor: Single hook retractor Czerny's retractor's nerve hook retractor Morris retractors deaver's retractors.
5	Care washing sterilization and maintenance of Endoscopic Instruments, Orthopedic Power instruments, Advanced OT tables & their attachment.
6	Types setting & Use of Image intensifier Portable X-ray Machine, Cautery Machine, suction machine, pulse oxymeter & cardiac monitor
7	Wound Management - Scissors and its types, sucking material and techniques, disinfectants and irritant, dressing procedures, different types of bandages, surgical needle & needle holders, various types of suture material.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

### **POST ANESTHESIA CARE UNIT (PACU)**

UNIT	CONTENTS
1.	Airway integrity and compromise.
2.	Arrhythmia.
3.	Hypertension.
4.	Hypotension.

5.	Pain prevention and relief.
6.	Nausea and vomiting.
7.	Decreased urine output.
8.	Emergence delirium.
9.	Delayed emergence from anesthesia.
10.	Shivering.
11.	Post obstructive pulmonary edema.
12.	Evaluation to Determine Goal Achievement (End posting summative).

**LEARNING SOURCE:** Self Learning Materials.

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**BASIC SURGERY – (P)**

UNIT	CONTENTS
1	Identification & Demonstration of working of the equipment, Fumigation, Cleaning and disinfection of articles, Packing articles for sterilization, Sterilization of equipments.
2	Care Sterilization & lubrication of Orthopedic Power instrument, Setting up table for various surgeries& portable X-ray Machine Cautery Machine Types Setting & Uses, Positing for orthopedic patient and other surgeries.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**CLINICAL PRACTICAL TRAINING-O.T. – (P)**

UNIT	CONTENTS
1	Introduction to equipments - Simple usage Indication and contraindication of use, `Repair and maintenance of equipments used in laboratory, colorimeter digital, Centrifuge (different types), Serological water Bath 37°C.
2	Micropipette, Balances (different type), Distilled water units, Hot air oven, Autoclave, Water bath. (different types), pH Meter, Incubator Microtome (different types), Semi auto and fully automatic analyzer (Biochemistry Analyzer), Fully automatic cells counter, Flame

	photometer, Automatic tissue processor, Automatic cover slipper. Automatic blood weight machine, Rotary shaker, Microscope, monocular, binocular, dark field immersion.
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**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 - Medial Laboratory manual for tropical countries vol. I, II. Author : Publisher : Monica chesbrough ELBS edition.
- B. Reading 2 - Medical Laboratory technology a procedure manual for routine diagnostic test - vol - I, II, III. Author : Kanai L. Mukharjee tata me grow hill pub. New Delhi.

**O.T. INSTRUMENT CARE & MAINTENANCE - (P)**

UNIT	CONTENTS
1.	Identification & Demonstration of working of the equipment, Fumigation, Cleaning and disinfection of articles, Packing articles for sterilization, Sterilization of equipments, Care Sterilization & lubrication of Orthopedic Power instrument, Setting up table for various surgeries, Scrubbing gloving & gowning.
2.	Handling of image intensifier & portable X-ray Machine Cautery Machine Types Setting & Uses, Positing for orthopedic patient and other surgeries, Advanced O.T. Table & Their attachment as well as their maintenance, Assisting with Anesthesiologist, Observing and monitoring the patient in recovery room, Terminal disinfection.

**LEARNING SOURCE:** Self Learning Materials.

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**HOSPITAL TRAINING (FOR 45 DAYS) AFTER THE FINAL EXAMINATION**

### YEAR III

## **ENVIRONMENTAL & BIO MEDICAL WASTE MANAGEMENT**

<b>UNIT</b>	<b>CONTENTS</b>
1.	Biotic and Abiotic environment, Adverse effects of Environmental Pollution, Control Strategies, Various Acts and Regulation.
2.	Water Pollution, Water Quality Standards for potable water, Surface and underground water sources, Impurities in water and their removal, Denomination, Adverse effects of domestic waste water and industrial effluent to surface water sources, Eutrophication of lakes, Self purification of steams.
3.	Air Pollution, Sources of air contaminations, Adverse effects on human health, Measurement of air quality standards and their permissible limits, Measure to check air pollution, Greenhouse effect, Global warming, Acid rain, Ozone depletion.
4.	Bio Medical Waste Management, Introduction to bio medical waste, Type of bio medical waste, Collection of bio medical waste.
5.	Land Pollution, Soil conservation, Land erosion, Afforestation.
6.	Ecology, Basics of species, Population dynamics, Energy flow, Ecosystems, Social Issues and the Environment, Sustainable development and Life Styles, Urban problem related to energy, Resettlement and Rehabilitation of people, Energy flow, Consumerism and waste products, Water Harvesting and Rural Sanitation, Water harvesting techniques, Different schemes of Rural Water Supply in Rajasthan, Rural Sanitation, Septic Tank, Collection and disposal of wastes, Bio-gas, Community Awareness and participation.
7.	Non-Conventional (Renewable) source of energy, Solar energy Wind energy Bio mass energy Hydrogen energy.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Environmental science-Coming ham Saigo.
- B. Solid waste management-C.L. men tall.
- C. Environmental Technologies for Sustainable Development Dr. Upendra Pnadel, DR M.P. Poonia.



## **BASIC SURGERY, SURGICAL EQUIPMENTS & MACHINERY**

UNIT	CONTENTS
1.	Introduction of surgery and basic principles of surgery, Tumors benign and malignant cyst ulcers sinuses fistula differential diagnosis of cyst and tumor, Fractures and Dislocation, Classification of fracture management fixation reduction immobilization principles of closed reduction artificial prosthesis, Comparative and Surgical Anatomy, Investigating of breast benign disease carcinoma of breasts treatment of carcinoma of breast mastectomy.
2.	Head Injury, Common manifestation management of patient surgical interventions, Cleft lip & palate acute appendicitis urethral strictures, Different Surgical Instrument, Instruments used in major surgical operation including Biliary Tract Surgery Anorectic Surgery, Urological Surgery Orthopedic Surgery Instruments Obstetrics and Gynecological Surgery instruments Plastic Surgery Instruments.
3.	Storing Sterilization and disinfections in O.T., General Surgical Principles and Instruments: The surgical patient operation room technique, Instrument used for preparing Surgical Cheatles forceps rampleys sponge holding forcep mayo's towel clip esmarch bandage simple tourniquet Pneumatic tourniquet, Incision making method and instruments, Bard parker knife handle major abdominal incision artery forceps and their types instruments used in homeostasis Kocher's forcep electrocautery Retractor, Single hook retractor Czerny's retractor's nerve hook retractor Morris retractors deaver's retractors.
4.	Care washing sterilization and maintenance of Endoscopic Instruments Orthopedic Power instruments Advanced OT tables & their attachment, Types setting & Use of Image intensifier Portable X-ray Machine Cautery Machine suction machine pulse oxymeter, cardiac monitor.
5.	Wound Management, Scissors and its types sucking material and techniques disinfectants and irritant dressing procedures different types of bandages surgical needle & needle holders various types of suture material.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

## **BASIC ANAESTHESIA TECHNOLOGY**

UNIT	CONTENTS
1.	Gas physics, States of matter, Temperature conversion, Humidity, Pressure measurement, Gas flows and diffusion, Gas laws, miscellaneous concepts such as density and specific gravity.
2.	Medical Gas Supply, Compressed gas Cylinders, Colour coding, Cylinders and Cylinder valves, Cylinder storage, Diameter index safety system, Medical gas pipeline system and station outlets, Air compressors, Oxygen concentrators, Alarms and safety devices.

3.	Gas Administration Devices, Simple oxygen administration devices, Methods of controlling gas flow, Reducing valves, Flow meters, Regulators, Flow restrictors.
4.	Oxygen Therapy, Definition, Causes and responses to hypoxemia, Clinical signs of hypoxemia, Goals of oxygen therapy, Evaluation of patients receiving oxygen therapy, Hazards of oxygen therapy.
5.	Anesthesia Machine, Hanger and yoke system, Cylinder pressure gauge, pin index, Pressure regulator, Flow meter assembly, Vaporizers – Types, hazards, maintenance, filling and draining.
6.	Breathing System, General considerations, Classification and breathing system, Mapleson system, Jackson Rees system of Bain circuit, Non breathing valves – Ambu valves, Others.
7.	Gas Analyzers Pulse Oximeter CO <sub>2</sub> Monitor, Gas analysis, Types and care, Transcutaneous oxygen monitors, Pulse oximeters, Capnography.
8.	Manual Resuscitators, Types of resuscitator bags, Indications, Hazards, Methods of increasing oxygen delivery capabilities while using, oxygen with resuscitator bags.
9.	Artificial air ways (oral and Nasal endotracheal tubes, tracheotomy tubes), Parts of airway and features, Types, sizes and methods of insertion, Indications for use, Care of long term airways and complications, Protocol for tracheostomy decannulation, Face masks – Types, sizes and its usage.
10.	Methods of cleaning and sterilization of anesthetic equipments.
11.	History of Anesthesia, Prehistoric (Ether) era, Inhalational anesthetic era, Regional anesthetic era, Intravenous anesthetic era, Modern anesthetic era.
12.	Minimum Standards for anesthesia, Who should give anesthesia, Ten golden rules of anesthesia, Patient assessment and preparation, Checking the drugs and equipment, Keeping the airway clear, Be ready to control ventilation, Monitor pulse and BP.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

A. Reading 1 .....

B. Reading 2.....

## **ADVANCED ANAESTHESIA TECHNOLOGY**

UNIT	CONTENTS
1.	Boyle's Machine & Its functioning, Boyle's Vaporizer, Magill's breathing circuit Bains breathing circuit pediatric anesthesia circuit, Gas cylinder and flow meters, Carbon dioxide absorption container, Suction apparatus-foot operated electrically operated, Ambubag laryngoscope hand tracheal tubes, Catheters face masks venti mask drugs, General Principles, Pharmacological classification of drugs Route of drug administration precautions in administration principles of drug toxicity prevention and treatment of poisoning adverse drug reaction.
2.	Sedatives & Hypnotics, Barbiturates morphine and others, Important groups of drugs, NS

	and other IV fluids ibuprofen, aspirin, antimicrobial agents ant allergic drugs ant diuretics, Pre-anesthetic medication, Local Anesthetic agents, Spinal Anesthetic agents, General Anesthetic agents.
3.	Medical ethics and the relevant medico legal aspects, Responsibilities and duties, - Ethical behavior and conduct, Medico legal aspects and its relation to consumer protection act.
4.	Basics of computer application, Basic structure of computers, Micro processors in computers, Principles of computer application in various fields.
5.	Basics of medical statistics, Common statistical terms, Sources and presentation of data, Measures of location – average and percentiles, Measures of central tendency and dispersion, Normal distribution and normal curve, Sampling and probability, Sampling variability and its significance, Significance of difference in mean, Chi-square test, Designing and methodology of an experiment of a study, Representation of data as tables and graphs, Demography of vital statistics, Standard deviation, P value and its significance, Recording of data and maintenance of records.
6.	Biomedical waste and its management, Electricity and electro medical equipments and safe guards, Basics of electricity and functioning of electro medical equipments, Earthing and care of apparatus, Static electricity, Fires and explosion causes, prevention of fire and explosions, electrical hazards, History of Anesthesia Introduction Antecedents of modern anesthesia Evolution of modern anesthesia.
7.	Anesthesia Operating Room, Dye allergies, Embolization, Examination for magnetic resonance imaging (MRI), Monitoring, Equipment options in the MRI suite, General anesthetic/sedation techniques.
8.	Electroconvulsive shock therapy (ECT), Preoperative, Anesthetic techniques and drug effects on seizure duration, Hemodynamic responses and appropriate treatment, Cardiac catheterization, Preoperative evaluation of children, Aesthetic consideration, Children, Electrophysiological tests/radio frequency ablation Cardio version.
9.	Urology Service (This service may be OPD or OT), Become skilled in anesthetic technique applicable to the Genitourinary Clinic, Transurethral resection of the prostate, recognize and treat hyponatremia, know different anesthetic options and advantages and disadvantages of each, Irrigation fluid options, know advantages and disadvantages of each Anesthetic techniques for extracorporeal shock wave lithotripsy, Anesthetic consideration for percutaneous placement of nephrostomy.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**APPLIED ANAESTHESIA TECHNOLOGY**

UNIT	CONTENTS
1.	Principles of anaesthesia system (Boyle anaesthetic machine) Cylinders, storage of gases, oxygen, nitrous-oxide, tests for cylinders, cylinder valves, pin index system, safe use of cylinders, Liquid oxygen, oxygen concentrators, Anaesthesia machine, pressure gauge,

	pressure regulator, flow meters, carbon-dioxide absorber, pressure relief valves, rebreathing bags, face masks, Boyle vaporizers, ether bottle, halothane vaporizer, fluotech mark one to six, Pipeline system, central pipeline system, advantages and hazards.
2.	Anaesthesia gadgets, different types of laryngoscopes and blades, Endotracheal tubes, description of plane and cuffed endotracheal tubes (nasal/oral), indications, methods of insertion, sterilization and complication, Other types of endotracheal tubes, latex armoured tubes, ring, Adair and elwyn tube, microlaryngeal tubes, endobronchial tubes etc., Classifications of breathing circuits, Explaining details about maplesons to system, bain circuit, lack circuit, etc., Methods of anaesthesia.
3.	Introduction to general anaesthesia and regional anaesthesia, Stages of ether anaesthesia, intravenous anaesthetic agents uses and complications, Pre-medication indication, type of drugs used for pre-medication, doses and side effects, Drugs used in anaesthesia, narcotic agents, anticholinesterase drugs, vasopressor drugs, antiarrhythmic drugs, hypotensive drugs, hypoglycaemic drugs, anticoagulant drugs, antihypertensive drugs etc.
4.	Neuromuscular blocking agents used in anaesthesia practice, Inhalation anaesthetics, nitrous oxide, diethyl ether, halothane, enflurane, isoflurane, sevoflurane, desflurane, their indications and complications, Intra-operative management, monitoring during anaesthesia by use of monitors.
5.	Monitoring during anaesthesia, clinical monitoring, by use of monitor monitoring the patient example arterial blood pressure monitoring, electrocardiogram, pulse oximetry, capnography, neuromuscular monitoring etc., Monitoring during shifting of the patient from operation theater to postoperative care unit, Monitoring of the patient in postoperative care unit, complications in the postoperative period and acute pain management in postoperative ward.
6.	Regional Anaesthesia, Local anaesthetic agents used in regional anaesthesia, indications, contraindications, dosage, complications, route of administration example lignocaine, bupivacaine etc Regional anaesthesia, spinal anaesthesia in all age group of patients, indications, contraindications, commonly used local anaesthetics, adjuvants, Epidural anaesthesia, epidural anaesthesia in all age group of patients, indications, contraindications, commonly used local anaesthetics, adjuvants.
7.	Caudal anaesthesia in all age group of patients indications, contraindications, commonly used local anaesthetics, adjuvants, Regional blocks, brachial plexus block, popliteal block, hernia block etc., indications, complications, Anaesthesia for common surgical procedures, General anaesthesia/regional anaesthesia in surgery, orthopedics, obs and gynae example appendectomy, lower segment cesarean section, intramedullary nailing etc.
8.	Anaesthesia for coexisting diseases, Hypertensive patients, ischemic heart disease, elderly patients, diabetic patients, renal failure patients, bronchial asthma, head injury patients etc. Anaesthesia for special situations, Dental anaesthesia, Out-patient anaesthesia, Patients in shock, respiratory failure, cardiac diseases, trauma and in emergency medical diseases.
9.	Complication in anaesthesia, regional anaesthesia and general anaesthesia, Basic principles of fluid management during surgery, accidents, shock, cardiac patients, Basic principles of blood transfusion and complications, Ventilators: types of ventilators, modes of ventilation, sterilization of the ventilator, Cardiopulmonary resuscitation: Basic life support, advanced cardiac life support, Intensive coronary care unit, Pain management: acute and chronic.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**BASIC SURGERY , SURGICAL EQUIPMENTS & MACHINERY – (P)**

UNIT	CONTENTS
1	Identification & Demonstration of working of the equipment, Fumigation, Cleaning and disinfection of articles, Packing articles for sterilization, Sterilization of equipments.
2	Care Sterilization & lubrication of Orthopedic Power instrument, Setting up table for various surgeries& portable X-ray Machine Cautery Machine Types Setting & Uses, Positioning for orthopedic patient and other surgeries.
3	Advanced O.T. Table & Their attachment as well as their maintenance, Assisting with Anesthesiologist, Observing and monitoring the patient in recovery room, Terminal disinfection.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- C. Reading 1 .....
- D. Reading 2.....

**BASIC ANAESTHESIA TECHNOLOGY – (P)**

UNIT	CONTENTS
1	Medical ethics, Medico legal aspects, Basics of computer application, Basic of medical statistics, Biomedical wastes, Electricity and electro medical equipments, Fire and explosion 8 History of anesthesia, Physics in principles of anaesthesia machine, Boyle’s machine in details.
2	Pipeline system, Anaesthesia gases, Vaporizers, Anaesthesia gauges, Different types of endotracheal tubes and endobroncheal tubes, Breathing circuits, General anaesthesia, Neuromuscular blocking drugs 11. Monitoring in anaesthesia.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

**APPLIED ANAESTHESIA TECHNOLOGY – (P)**

UNIT	CONTENTS
1	Attending preoperative rounds with anaesthesiologists, Attending postoperative rounds with anaesthesiologists, Attending pain clinic everyday along with anaesthesiologists, Attending

	rounds in ICU, ICCU, MICU, SICU along with anaesthesiologists and understanding, ventilators and its implication and sterilization, Attending regular operation theatre for regular anaesthesia cases and attending emergency cases along with anaesthesiologists.
2	Arrangement of anaesthesia trolley for general anaesthesia, Arrangement of anaesthesia for regional anaesthesia example: epidural, bracheal etc., Arrangement of monitors and anaesthesia machine before starting of any cases for anaesthesia, Sterilization of anaesthesia machine, Arrangement of anaesthesia breathing circuits ex: Magill's, Ayer's circuits etc., Filling of soda lime canstors of close circuits, Arrangement of Simple oxygen administration devices during postoperative ward.
3	Airway gadgets arrangements during anaesthesia procedures like Oropharyngeal airways, Nasopharyngeal airways, Endotracheal tubes and Laryngeal mask airways etc., Anaesthesia Vaprizers to be filled and make arrangements for inhalational anaesthesia with use of Either, Halothane and Enflorane etc., Assisting anaesthesiologists during blood transfusion,  Assisting in transfusion of fluids ex. Ringer lactate, dextrose 5% etc., Assisting anaesthesiologist during patient in shock, complications of general anaesthesia and regional anaesthesia, Assisting anaesthesiologists during bronchoscopy and invasive procedures during anaesthesia, Observing cardiopulmonary resuscitation, Assisting during transportation of patients from casualty to other wards and care units.

**LEARNING SOURCE:** Self Learning Materials

**ADDITIONAL READINGS:**

- A. Reading 1 .....
- B. Reading 2.....

## **HOSPITAL TRAINING (FOR 45 DAYS) AFTER THE FINAL EXAMINATION**