NIMS UNIVERSITY

SYLLABUS

OF

DIPLOMA IN OPERATION THEATRE TECHNOLOGY – DOTT10

VERSION 2.0

DIRECTORATE OF DISTANCE EDUCATION

Shobha Nagar, Jaipur-Delhi Highway (NH-11C), Jaipur- 303121
Rajasthan, India

DIPLOMA IN OPERATION THEATRE TECHNOLOGY – DOTT10

Eligibility	:	10th
Programme Duration	:	3 Years
Programme Objectives	:	The operation 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	Continuous Assessment (Internals)	Credits
ANT12102	Basic Anatomy, Physiology and Pathology	70	30	5
MBL12102	Basic Microbiology	70	30	4
BCH12102	Basic Biochemistry	70	30	4
CSC14105	Fundamentals of Computer Science	70	30	4
ENG14102	Communication for Professionals	70	30	4
ANT12102P	Basic Anatomy, Physiology and Pathology (P)	35	15	3
MBL12102P	Basic Microbiology (P)	35	15	3
BCH12102P	Basic Biochemistry (P)	35	15	3
	Total	**650**		**30**

YEAR II

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
ANT12204	Human Anatomy and Physiology	70	30	5
OTT12205	Introduction to Operation Theatre Technology	70	30	5
OTT12202	Basic Anesthesia Equipment & Drugs	70	30	4
OTT12204	Post Anesthesia Care Unit (PACU)	70	30	4
HHM12201	General Principles of Hospital Practice and Patient Care	70	30	4
ANT12204P	Human Anatomy and Physiology (P)	35	15	2
TRN12201P	Clinical Practical Training-O.T. (P)	100		3
TRN12202P	Advanced O.T Instrument Care & Maintenance (P)	100		3
	TOTAL	**750**		**30**

YEAR III

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
WCM12301	Environmental & Biomedical Waste Management	70	30	4
OTT12301	Basic Surgery, Surgical Equipments & Machinery	70	30	4
OTT12302	Basic Anesthesia Technology	70	30	4
OTT12303	Advanced Anesthesia Technology	70	30	4
OTT12304	Applied Anesthesia Technology	70	30	4
OTT12301P	Basic Surgery , Surgical Equipments & Machinery (P)	35	15	2
OTT12303P	Advanced Anesthesia Technology (P)	35	15	3
OTT12304P	Applied Anesthesia Technology (P)	35	15	3
TRN12301	Hospital Training	100		2
	TOTAL	**750**		**30**

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

BASIC ANATOMY, PHYSIOLOGY AND PATHOLOGY – ANT12102

UNITS	CONTENT
SECTION A (BASIC ANATOMY)	
1	**Levels of Organization of Organisms:** Structural levels of Organization; Chemical level; Cellular level; Tissue level; Organ level; System level; Complete organism; The Chemical level - Definition and brief discussion of atom & molecule; The cell overview about—Its structure, major cell organelles, plasma membrane & cell division; Tissue - Brief discussion about the types of tissues in the body; Organ - Brief discussion about- Major organs in the body; Organ system - Meaning and definition; Types of Organ System; Overview of Muscular, skeletal, digestive systems; Whole organism - Brief introduction about- Six recognized kingdoms of living organisms & Classification of humans.
2	**Human Anatomy:** Basic Terminology; introduction to anatomy; anatomical vocabulary; Relative location - skull, arm, planes, functional states; Regions- land marks, body cavities, body formation, role & functions of cell, tissue and organ in human body formation.
3	**Skin and Connective Tissue:** Skin - Definition of Skin; Layers of skin; Types of skin; Functions; Connective tissue - Definition; Brief discussion on – Bone, Cartilage, Embryonic connective tissue-Mesenchyme; Mucous or mucoid.
4	**Skeletal System:** The skeletal system; bone structure; bone cells; bone marrow; bone growth; ossification; and epiphyseal plates of bone.
5	**Joints:** Introduction to joints; categories of joint; joint movement.
6	**Muscular System:** Overview; Muscular system anatomy - origin and insertion, function, muscle tissue types, microanatomy shape of muscle, muscle contractions.
7	**Cardiovascular System:** Definition and meaning of Cardiovascular system; Types of blood vessels; General structure and Functions of Artery, Vein, and Capillaries & Sinusoids; Anastomosis - definition and function; Circulation – Brief discussion; Types of Circulation - Systemic and Pulmonary.
8	**Lymphatic System:** Introduction to lymphatic system; lymphatic capillaries; lymphatic vessels; lymph nodes; lymphatic organs.
9	**Surface Anatomy:** Definition of Surface Anatomy; Significance of Surface marking; Four techniques for examining body - visual inspection, palpation, percussion and auscultation.
SECTION B (BASIC PHYSIOLOGY)	
10	**Introduction:** Introduction to human Physiology; Definition; Difference between human anatomy and physiology; Structure and functions of cytoplasmic organelles; Reproduction – Meiosis, Mitosis, Endocytosis and Exocytosis, Homeostasis.
11	**Physico-chemical Laws:** Diffusion; osmosis; bonding; filtration; dialysis; surface tension; adsorption; colloid.
12	**Fundamentals of Different Organ Systems:** Cardiovascular system; Respiratory system; Digestive system; Excretory system; Reproductive system; Endocrine system; Lymphatic system; Nervous system.
13	**Blood:** Composition of blood; functions of blood; plasma proteins; RBC – Erythropoiesis; pathological and physiological variations of RBC; Hemoglobin – structure, function and metabolism; WBC – structure, types and function, Platelets, coagulation of blood, anticoagulants, bleeding disorders. Blood groups and Rh factor.
14	**Cerebrospinal Fluid:** History; Functions; circulation; production; composition; pathology and laboratory diagnosis.

15	**Sense Organ:** Physiology of sense organs – taste, olfaction, vision and hearing.
SECTION C (BASIC PATHOLOGY)	
16	**Introduction to Pathology:** Introduction to general pathology; the cell in health and disease; Inflammation - acute and chronic, derangement of body fluids and electrolytes - types of shocks, Ischaemia, Infection, Infectious diseases, Disease of infancy and childhood, Neoplasia- Etiology and Pathogenesis.
17	**Different Branches of Pathology:** Introduction to various branches of pathology; Overview of systemic pathology, cytopathology, histopathology, hematology, blood banking, clinical pathology and Immunopathology.
18	**Laboratory Management:** Collection of sample, labeling, transport, screening, reporting and dispatch of reports, Hb estimation, TLC and DLC, RBC count; Peripheral blood film - staining and study of Malaria parasite.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Marieb, E.N., and S.J. Mitchell. Human Anatomy & Physiology Laboratory Manual: Cat and Fetal Pig Versions. Ninth Edition Updates. Benjamin Cummings, 2009.

B. Tortora, G.J. and Derrickson, B. Principles of Anatomy and Physiology. Wiley 2006 ISBN 01-471-68934-3.

C. Feder, ME; Bennett, AF; WW, Burggren; Huey, RB (1987). New directions in ecological physiology. New York: Cambridge University Press. ISBN978-0-521-34938-3.

WEB LINKS:

A. http://medical-dictionary.thefreedictionary.com

B. http://fee-ed.net/free-ed/Resource/Sci/Biol/AnatomyPhysiol/Human01.asp

C. http://units.handbooks.uwa.edu.au/units/phy1/phy12001

BASIC ANATOMY, PHYSIOLOGY AND PATHOLOGY (P) – ANT12102P

1. Histology
   a) Introduction to Histotechniques
   b) Introduction to Microscope
   c) Epithelium
   d) Histology of Skeletal muscle
2. Osteology
   a) Appendicular skeleton
   b) Axial skeleton
3. Specimen
   a) Cell
   b) Joint
   c) Muscle
   d) Blood vessel
4. Identify compound microscope and its components.

5. Blood sample collection: Requirements.
6. Demonstration on Hemocytometer.
7. Requirements for Erythrocyte Sedimentation Rate (ESR) and Packed Cell Volume (PCV) estimation.
8. Hemoglobinometer and Identify its components.
9. Demonstration on requirements of BP measurement.
10. Requirements to prepare a peripheral blood smear & Differential Leukocyte Count (DLC).
11. Requirements for blood group determination.
12. Requirements to determine bleeding time and clotting time.

BASIC MICROBIOLOGY – MBL12102

UNIT	CONTENT
1	**Introduction to Microbiology:** Meaning & definition of microbiology; Brief history of microbiology & contribution by Antony Van Leeuwenhoek, Robert Koch & Louis Pasteur in the field of microbiology; Organism included in the study of microbiology; Meaning & definition of microorganism and its types; Brief overview of diseases caused by microorganism and its preventive measures.
2	**Cell Structure & Function:** Definition, structure and function of cell; Types of cells-prokaryotic & eukaryotic cells; Structure and function of eukaryotic & prokaryotic cell; Distinguishing features between; Eukaryotic cell & prokaryotic cell.
3	**Structure of Bacteria:** Definition & structure of bacteria; Types of bacteria; Classification of bacteria on the basis of shapes; Structure of Gram positive and Gram negative bacteria with special reference to cell wall.
4	**Common Equipments used in Microbiology Laboratory:** Introduction to common equipments; Types of equipments used in microbiology laboratory; Principle and uses of Incubators, Hot air Oven, Water Bath, Anaerobic Jar, Centrifuge, Autoclave, Microscope; Glassware-description of glassware, its use, handling and care; Safety measures in handling microbiology equipments.
5	**Concept of sterilization:** Meaning, definition & role of sterilization; Classification & uses of sterilization; General principle of sterilization.
6	**Antiseptics and Disinfectants:** Meaning, definition & uses of antiseptics & disinfectants; Types & mode of action.
7	**Laboratory Management and Planning:** Introduction to Laboratory management & planning; Basic definition of management and planning; Concept of laboratory management; Recording of specimen and maintenance of laboratory records, care & maintenance of glassware; Safety measures in microbiology laboratory with universal safety precaution.
8	**Collection & Transportation of Specimen for Microbiological Investigation:** Introduction of collection & transportation of specimen; Rules for collection & transportation of specimen; Methods of collecting different samples- blood, urine, faeces, sputum, pus, body fluids, swab; Methods of preservation, types of container & criteria for rejection of specimens.
9	**Disposable of Laboratory/Hospital WASTE:** Definition of hospital waste; Identification of all types of waste treatment; Noninfectious waste; Infected sharp waste disposal; Infected non sharp waste disposal.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Gerard J. Tortora, Berdell R. Funke, Christine L. Case, Microbiology: An Introduction, Eight Edition, Hardcover: 944 pages, Publisher: Benjamin Cummings.
B. Prescott, Harley and Klein's Microbiology 7th Ed. Author: Joanne M Wiley, Christopher J Woolverton, Linda M Sherwood.
C. Sherris Medical Microbiology: An Introduction to Infectious Diseases by Kenneth J. Ryan, C. George Ray, Hardcover: 992 pages Publisher: McGraw-Hill Medical.

WEB LINKS:

A. http://www.microbeworld.org/history-of-microbiology
B. http://www.britannica.com/EBchecked/topic/48203/bacteria/39334/Diversity-of-structure-of-bacteria.
C. http://www.textbookofbacteriology.net/themicrobialworld/control.html.

BASIC MICROBIOLOGY (P) – MBL12102P

1. Demonstration of common equipments used in Microbiology.
2. Demonstration of containers and glassware.
3. Demonstration of Culture Media with Growth.
4. Preparation and Examination of Blood Smear.
5. Collection of Clinical Specimens and their Processing in Laboratory.

BASIC BIOCHEMISTRY – BCH12102

UNIT	CONTENT
1	**Introduction to Biochemistry:** General introduction and role of biochemist, ethics, responsibility, safety measures and first aid; Cleaning and care of general laboratory glassware and equipment; Distilled water - types of distilled water plants, preparation & storage.
2	**The Cell**: Introduction of cell; prokaryotes and eukaryotes; the cell membrane; cytoplasm; fluid mosaic model of cell membranes; membrane proteins; the nucleus (nuclei); mitochondria; ribosomes; endoplasmic reticulum (er); golgi apparatus; centriole; plant cell structures; and Multicellular organization.
3	**Carbohydrates:** Chemical structure; function; Classification – monosaccharides, disaccharides, polysaccharides, homopolysaccharides, heteropolysaccharides, and glycoproteins.
4	**Proteins:** Amino acids; Classification; Structure of protein; Determination of protein structure; Properties of proteins; Denaturation; Classification of proteins; Atigen; Antibody types of plasma proteins; Blood clotting.
5	**Lipids:** Chemical structure; functions; classification - fatty acids, triacylglycerols, phospholipids, glycoproteins, lipoproteins, steroids, amphipathic lipids.
6	**Vitamins and Minerals:** Fat soluble vitamins (A, D, E, and K); water soluble vitamins: B-complex vitamins; principal elements (Calcium, phosphorus, magnesium, potassium, chlorine and sulphur); trace elements; calorific value of foods; basal metabolic rate (BMR); respiratory quotient (RQ) specific dynamic action (SDA); balanced diet – Marasmus and Kwashiorkor.
7	**Nucleic Acids & Enzymes:** Definition of DNA; Nucleic acids- structure of DNA, Watson & Crick model of DNA; Types of RNA; Enzyme definition – nomenclature, classification, Factors affecting enzyme activity, active site, co-enzyme, mechanism of enzyme action, enzyme pattern in diseases.

8	**Analytical Balance & Standard Solutions:** Introduction to analytical chemistry; definition and principle of analytical balance; working and maintenance; preparation of reagents; formulation and preparation; vented balanced safety enclosure; various standard solutions used their preparation; storage of chemicals.
9	**Units of Measurements:** S.I units – definitions, conversions, measurement of volume strength; Normality; molarity; molality; volumetric apparatus - calibration of volumetric apparatus; Definition – mole, molar and normal solutions (preparation, standardization), pH (definition, PKa value, example, derivation of Henderson – Hasselbach equation); Buffer solutions (definition, preparation of important solutions); pH indicators (pH papers, universal & other indicators); pH measurement – different methods (ph paper, pH meter, principle of pH meter, structure, working and maintenance.
10	**Radio Isotopes:** Introduction to isotopes and radio isotopes; uses of isotopes and radio isotopes in biochemistry; radio isotopes properties; isotope v/s nuclide; radioactive displacement law; alpha decay and beta decay.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Voet & Voet: Text Book of Biochemistry: Wiley 3rd Ed.

B. Lehninger, Principles of Biochemistry: Nelson and Cox 4th Ed.

C. Harper Illustrated Biochemistry, McGraw Hill: Lange: 28th Ed.

WEB LINKS:

A. http://www.aceglass.com/dpro/kb_article.php?ref=8386-IPSF-3037

B. http://www.ilo.org/legacy/english/protection/safework/ghs/ghsfinal/ghsc10.pdf.

BASIC BIOCHEMISTRY (P) – BCH12102P

1. Cleaning of Glassware.
2. Preparation of distilled water.
3. Standardization of distilled water.
4. General tests of carbohydrates.
5. General test of protein.
6. General test of lipids.
7. Demonstration of analytical balances.
8. Calibration of volumetric pipette.
9. Identify the acids and bases.

FUNDAMENTALS OF COMPUTER SCIENCE – CSC14105

UNIT	CONTENT
1	**Computer Application:** Introduction to Computer - Advantages of computers, Limitations of computers, Application of Computer in Different Fields of Life, Computer Generations, and Classification of Computers; Characteristics of computers; Computer System; Input Unit; Output Unit; Central Processing Unit; Storage or Memory Unit - Primary Storage or Main Memory (MM), Memory Unit – Secondary Storage.
2	**Computer Organization:** Overview of Computer Organization; Central Processing Unit; Control Unit; Arithmetic Unit; Instruction Set - Difference between RISC and CISC; Register; Processor Speed - Higher is not Always Better, Keep-up with Technology, Price is not

	Everything.
3	**Memory:** Overview of Storage Devices; Main Memory; Storage Evaluation Criteria - Access Time, Memory Cycle Time, Effective Access Time; Memory Organization - Addressing Strategies, Organization of Memory Units, Content-Addressable Memories; Memory Capacity; Random Access Memories; Read Only Memory; Secondary Storage Devices; Magnetic Disk; Floppy and Hard Disk - Floppy disk drive, Hard Discs; Optical Disks CD-ROM - Compact disk, DVD, Blu-Ray disk, HD-DVD; Mass Storages Devices; and Differences between the Primary and Secondary Memory.
4	**Input Devices:** Keyboard; Mouse; Trackball; Joystick - Joystics in aviation, Joystics in Gamming, Analog Joystick, Digital Joystick; Scanner - Characteristics of a scanner, Types of scanner; Optical Mark Reader; Bar-code reader - Types of barcode; Magnetic Ink Character Reader (MICR); Digitizer; Card reader; Voice recognition; Web Cam; and Video Cameras.
5	**Output Devices:** Monitors - Characteristics of VDU, Types of VDU; Printers; Dot Matrix Printers; Inkjet Printers; Laser Printers; Plotters; Computers Output Micro Files (Com) - COM to CD Service, What Are the Benefits of COM?; Multimedia Projector - Criteria to evaluate suitable Projector.
6	**Operating System:** Microsoft Windows - An Overview of different version of windows, Basic Windows Elements, File Management through Windows 7; Using Essential Accessories - Disk Cleanup and Disk Defragmenter, Entertainment, Calculator, Note pad, Paint, Wordpad, Recycle Bin, Windows Explorer, and Creating Folder Icons.
7	**Word Processing:** Word Processing Concepts; Working with Documents - Create a New Document, Opening an Existing Document, Saving a Document, Renaming Documents, Working on Multiple Documents, Document Views, and Close a Document; Working with Text in Word - Selecting text, Editing Text, Finding and replacing text; Printing Documents; Formatting - Bullets and Numbering in Word, Alignment, Page designs and Layout, Editing and Proofreading; Working With Graphics - Inserting Clip Art Images, Moving Images in Word, Deleting images in Word, Text wrapping in Word, Creating Lines and Arrows in Word, Drawing Shapes in Word, Adding a Text Box; Working with Tables.
8	**Presentation Package:** Creating a New and Opening an Existing Presentation; Creating the look of your Presentation; Working with Slides - Adding and formatting Text, Formatting PowerPoint; Printing Handouts with Notes making; Images and Clip Art; Slide Shows.
9	**Internet and Email:** Definition about the World wide web & brief History; Use of Internet and Email – Internet, Email; Internet – Terminology, Protocols, Routing; Websites; The Mail Protocol Suite; Using Search Engine and beginning Google search; Exploring the next using Internet Explorer and Navigator; Uploading and Downloading of Files and Images; E-mail ID creation - Opening the E-mailbox, Sending Messages, and Attaching Files in E-mails.
10	**Hospital Information System:** Hospital Information System; Architecture of a Hospital Information System; Aim and Uses of HIS - Aim of HIS, Uses of HIS; Types of HIS; Benefits of using a Hospital Information Systems; Advanced Hospital Management System - XO Hospital Management System, LCS Hospital Management Information System, NVISH Hospital Management System.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Sunny Handa, “Fundamentals of Information Technology”, LexisNexis Butterworths.

B. Graeme G. Wilkinson, “Fundamentals of Information Technology”, Wiley.

C. Ramesh Bangia, “Computer Fundamentals and Information Technology”, Firewall Media.

WEB LINKS:

A. http://oer.nios.ac.in/wiki/index.php/COMPUTER_ANT_ITS_COMPONENTS

B. http://http://homepage.cs.uri.edu/book/cpu_memory/cpu_memory.htm.

C. http://uwf.edu/clemley/cgs1570w/notes/concepts-7.htm

COMMUNICATION FOR PROFESSIONALS – ENG14102

UNIT	CONTENT
1	**Essentials of Grammar:** Parts of Speech; Vocabulary building; Sentence; Articles; Pronouns; Quantity; Adjectives; Adverbs; Prepositions, Adverb particles and phrasal verbs, Verb; Verb tenses; Imperatives; Active and passive voice; Direct and indirect speech; The infinitive; Conditional sentences; Synonyms and antonyms; Singular and Plural; Figures of Speech; Punctuation and Phonetics.
2	**Nature, Scope and Process of Communication:** Defining Communication; Nature of Communication; Objectives/Purpose of Communication; Functions of Communication; Process of Communication; Elements of Communication Process; Process of Communication: Models; Working of the Process of Communication; Forms of Communication.
3	**Channels and Networks of Communication:** Channels of Communication; Communication Flow in Organizations: Directions/Dimensions of Communication; Patterns of Flow of Communication or Networks; Factors Influencing Organizational Communication.
4	**Principles of Effective Communication:** Communication Effectiveness: Criteria of Evaluation; Seven Cs of Effective Communication; Four Ss of Communication.
5	**Barriers in Communication:** Categorisation of Barriers; Semantic Barriers; Organizational Barriers; Interpersonal Barriers (Relating to Superior-subordinate); Individual or Psycho-sociological Barriers; Cross-cultural/Geographic Barriers; Physical Barriers/Channel and Media Barriers; Technical Aspects in Communication Barriers; Overcoming the Barriers in Communication; Measures to Overcome Barriers in Communication.
6	**Non-verbal Communication:** Characteristics of Non-verbal Communication; Relationship of Non-verbal Message with Verbal Message; Classification of Non-verbal Communication.
7	**Oral Communication: Informal Conversation:** Oral Communication; Informal Conversation; Learning Informal Conversation; How to Go About Learning Other Tricks?; Learning Conversational Skills; Internet Chat.
8	**Communication in Business Organizations:** Meaning of Business Communication; Types of Information Exchanged in Business Organizations; Role of Communication in Business Organizations; Importance of Communication in Management of Business Organizations; Scope of Communication in Organizational Setting; Characteristics of Effective Business Communication; New Communication Environment; Ethical challenges and Traps in Business Communication; Role of Communication in Three Managerial Roles Defined by Henry Mintzberg.
9	**Formal Conversations: Meetings, Interviews and Group Discussions:** Meetings; Duties of Participants; Interviews; Group Discussions.
10	**Greetings and Introduction:** Basics of greetings and introduction; formal and informal introduction; Reading comprehension, Vocabulary; Pronunciation: Falling and rising tone; Speaking: Body language; Listening: body language.
11	**Listening Skills:** Importance of Listening; Listening versus the Sense of Hearing; Listening as Behaviour; Payoffs for Effective Listening; Actions Required for an Effective Listener; Approaches to Listening; Misconceptions and Barriers that Impair Listening; Planning for Effective Listening; How to be a Good Listener?; What Speakers can do to Ensure Better Listening?.
12	**Formal and Informal Letters:** Distinction between Formal and Informal Letters; Writing Formal Letters; Informal Letters.
13	**Communication on the Net:** E-Mail; Netiquettes; Blog Writing; Web Writing.
14	**Report Writing: Business Reports:** Significance; Types of Reports; Five Ws and one H; Report Planning; Report Writing Process; Outline of a Report; Guidelines for Writing Report; Technicalities of Report Writing; Visual Aids in Reports; Criteria used for Judging the Effectiveness of a Report; Illustrations.
15	**Job Applications and Resume Writing:** Job Application/Covering Letter; Resume/CV Writing.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Harvard Business School Press (2003), Business Communication: Harvard Business Essentials, Boston, Massachusetts.
B. Krizan, A.C. Buddy, Merrier, Patricia, Logan, Joyce and Williams, Karen (2008), Business Communication, Thomson South-Western.
C. Guffey, m Mary E. (2000), Business Communication: Process and Product, South-Western College Publishing.;

WEB LINKS:

A. http://www.commissionedwriting.com/GRAMMAR%20ESSENTIALS.pdf.
B. http://www.esf.edu/fnrm/documents/FNRM_Communications_Handbook2008.pdf.
C. Http://books.google.co.in/books?id=RETE15K43qsC&printsec=frontcover&dq=essentials+of+english+grammer+pdf&hl=en&sa=X&ei=XlpSU6PEKY2HrgfyqoDoAQ&ved=0CDIQ6AEwAQ#v=onepage&q&f=false.

YEAR II

HUMAN ANATOMY AND PHYSIOLOGY – ANT12204

UNIT	CONTENT
1.	**Human Anatomy & Physiology:** A general view - 1) Organization of Organism: Cell – structure and function, Tissue – classification and function; microscopic structure of each type; 2) Human Anatomy- Introduction, Subdivisions of anatomy, Anatomical nomenclature - Terms of position, location and fundamental planes, Clinical terms; Introduction, Definition, Difference between human anatomy and physiology, Homeostasis, Body fluid, Transport through cell membrane - Passive Processes, The Principle of Diffusion, Simple diffusion, Facilitated diffusion Osmosis, Active Processes - Active Transport , Transport in Vesicles, The Primary Tissue, Organs and systems.
2.	**The Skeleto-Muscular System**: Brief discussion over skeletal system - Classification of skeleton- Axial and Appendicular; Major components of skeleton system- a) Bone- definition, synonym; Composition; Special features & Function; Classification; bone marrow, bone growth & ossification; features of a long bone; b) Cartilage-definition; Components and classification; Overview of Osteology of bones of— i) Upper limb - (Clavicle, Scapula, Humerus, Radius & Ulna and carpals), ii) Lower limb (Femur, Patella, Tibia & Fibula and tarsals) iii) Thorax - (sternum & ribs), iv) Abdomen- Pelvis, v) Skull bones; Cranial bones (Frontal, Parietal, Temporal, Occipital); Facial bones- (Maxilla and Mandible) - their position, orientation, side determination & ligaments attached. Joints - Definition of Joints, Functions, Classification of Joints based on –Structure and Function. Muscular system - Brief introduction of muscular system, muscle tissue types, General discussion of skeletal muscles, Brief knowledge of - Appendicular muscles & Axial muscles, microscopic structure of – skeletal, smooth and cardiac muscle & compact bone. Muscular Physiology - Functions and differences of skeletal, smooth and cardiac muscles - Properties of muscle excitability and contractility, summation of stimuli, summation of contractions, effects of repeated stimuli, genesis of tetanus, onset of fatigue, refractory period, tonicity, conductivity, extensibility and elasticity.
3.	**The Circulatory System**: Brief discussion about basics of circulatory system – components of circulatory system- structure of artery, vein, capillaries sinusoids; The Heart – Brief discussion about- General features of Heart; Shape and Size of Heart; Position of heart- general overview on- Mediastinum and relations of heart; Pericardium; Layers of heart-epicardium, myocardium and endocardium; Cardiac muscles; Chambers of heart and associated blood vessels; Valves of heart; Blood supply of Heart; vessels related to heart; Conduction system of heart; Functions of heart. Brief discussion over major arteries and veins of the body. Lymphatic system - Introduction to lymphatic system, brief overview of regional lymph nodes & lymphatic organs. Lymph, lymphatic circulation, functions of lymph. Cardio Vascular System Physiology - Functions of Heart & blood vessels (artery, vein and capillary), Blood circulation through heart, Blood Pressure - regulation & controlling factors, ECG Cardiac cycle Cardiac cycle and cardiac output. Blood Vascular System - Functions of blood vessels (artery & vein), Function of capillaries, Differences between artery & vein, Composition and functions of blood. Plasma proteins – normal values, origin and functions, Hemoglobin - Origin, formation, functions, Erythrocyte sedimentation rate (ESR) and its significance, Hematocrit: MCH, MCHC PCV and MCV.
4.	**The Respiratory System**: General discussion of respiratory system - cellular respiration; Brief knowledge of classification of respiratory system - upper conducting part & lower respiratory part; Brief discussion over anatomy of -larynx, trachea and bronchial tree; Lungs- anatomical position, relations, lobes, fissures, broncho-pulmonary segments, Pleura- Layers of pleura and Pleural cavities; microscopic structure of – trachea and lungs. Respiratory system Physiology - Respiratory system physiology, introduction, measurements of respiratory rates and volumes, gas laws, gas exchange, oxygen and carbon dioxide transport in the blood.
5.	**The Gastro-intestinal System**: General introduction of digestive system; Brief discussion over

	anatomy of – 1) The alimentary canal or GI tract (gastrointestinal tract): Mouth, Pharynx, Esophagus, Stomach, Small intestine, Large intestine & Anus; 2) The accessory digestive organs- brief discussion over –Teeth, tongue, Salivary glands, Gallbladder, Liver and Pancreas. GI system Physiology: Physiological anatomy of GIT. Digestion of food in the mouth (mastication), stomach, and intestine, Absorption of nutrients from digested food. Role of bile in the digestive process.
6.	**The Urinary System**: General concept of Urinary system; Brief discussion over anatomy of – a) Kidney-anatomical position, general features & structure of nephron, b) Ureter- general features and constrictions, c) Urinary bladder- anatomical position, general features & relations, d) Urethra- general features in males and females; Renal System Physiology - Function of kidney, Urine formation (filtration, re-absorption and secretion), Anomalies in urine concentration.
7.	**The Genital System**: Brief discussion over anatomy of – a) Male reproductive system - General features of primary & secondary reproductive organs, b) Female reproductive system - General features of primary & secondary reproductive organs; Reproductive system Physiology - Physiological anatomy of male and female reproductive organs; Brief overview of the formation of semen and spermatogenesis; Brief account of the menstrual cycle.
8.	**The Nervous System**: General discussion of nervous system; Classification of nervous system- a) Central Nervous System, Spinal cord: General features and functions, Brain- parts of brain, gyri, sulci, fissures, lobes, important sensory and motor areas, sensory homunculus, CSF and blood brain barrier; b) Peripheral Nervous System- brief discussion of cranial and spinal nerves. Brief discussion over major nerve plexus of body- brachial and lumbo-sacral plexus. Neuro-Physiology - Conduction velocity of nerve impulse in relation to myelination and diameter of nerve fibers, Properties of nerve fibers – excitability, conductivity, accommodation, adaptation, summation, refractory period, indefatiguability, Injury to peripheral nerves – degeneration and regeneration, Automatic nervous system – Physiological effect of Autonomic Nervous System - sympathetic & parasympathetic response, Integration & control of autonomic function- autonomic Reflexes, autonomic control by higher centers; Neural Transmission- Modes of transmission, sympathetic & parasympathetic response, Synaptic transmission-Electrical synaptic transmission & chemical synaptic transmission.
9.	**The Endocrine System**: General overview of endocrine system; General anatomical features and hormones secreted by- a) Pituitary, b) Thyroid, c) Parathyroid, d) Adrenal glands; Endocrine System Physiology - Introduction to the endocrine system, endocrine functions, endocrine glands and their functions.
10.	**The Special Senses**: Brief introduction; Types of special senses- a) Chemical senses, b) Vision, c) Ear; General anatomical overview of eyes, ear, nose and tongue; Physiology of Special Senses - Physiology of sense organ, Traditional senses- Hearing, Taste, Smell, Touch, Vision, Other senses- Balance and acceleration, Temperature, kinesthetic sense, pain.
11.	**Embryology & Development**: Definition and brief introduction of Embryology; Significance of Embryology; Developmental periods; Mechanism of Gametogenesis; Structure of Ovum & Sperm; Fertilization; Brief discussion on – a) Cleavage of zygote, b) Blastocyst Formation, c) Implantation, d) Bilaminar Germ Disc, e) Gastrulation, f) Neurulation, g) Development of somites, h) Organogenesis, i) Folding of embryo, j) Germ layer derivatives, k) Placenta, l) Parturition, m) Amnion & amniotic fluid, n)Yolk sac, o) Allantois, p) Multiple pregnancies.
12.	**Fluids, Electrolytes and Acid-base Balance**: Regulation of extracellular fluid osmolarity and sodium concentration; Integration of renal mechanisms for control of blood volume and ECF, renal regulation of potassium, calcium, phosphate, and magnesium; Regulation of acid base balance.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Wolfe SA Molecular and Cellular Biology. Belmont, CA: Wadsworth Pub. Co. p. 828. ISBN 0-534-12408-9, (1993).

B. Gray's Anatomy: The Anatomical Basis of Clinical Practice (40th Ed.) Churchill-Livingstone, Elsevier, 2008.
C. G.J. Tortora, B. Derrickson Principles of Anatomy and Physiology, Wiley, 12th Ed.

WEB LINKS:

A. http://www.techpe.com/anatomy/types_of_muslce_contractions.php.
B. http://webanatomy.net/anatomy/skeletal_notes.htm.
C. http://education-portal.com/academy/lesson/muslce-origin-and-insertion-definition-and-actions.html#lesson.

HUMAN ANATOMY AND PHYSIOLOGY (P) – ANT12204P

1. Histology
    a) Histotechniques
    b) Microscope
    c) Histology of Skeletal muscle
    d) Histology of Cardiac muscle
    e) Histology of Smooth muscle
    f) Histology of Bone
    g) Histology of Hyaline cartilage
    h) Histology of Elastic cartilage
    i) Histology of Fibro cartilage
    j) Histology of artery
    k) Histology of Vein
    l) Histology of Lung
    m) Histology of Trachea
    n) Histology of Eye
    o) Cornea
    p) Retina
    q) Optic nerve
2. Osteology
    a) Appendicular skeleton
    b) Axial skeleton

3. Specimen
    a) Heart
    b) Lung
    c) Stomach
    d) Kidney
    e) Liver
    f) Eye
    g) Brain
4. Study and Care of Microscope.
5. Hemocytometer.
6. Determination of Erythrocyte Sedimentation Rate (ESR) Packed Cell Volume (PCV).
7. Estimation of Hemoglobin Concentration.
8. Total RBC Count.
9. Determination of Red Blood Cell Indices.
10. Total Leukocyte Counts.
11. Preparation and Examination of Blood Smear & Differential Leukocyte Count (DLC).
12. Blood Pressure Measurement.
13. Determination of Blood Group.
14. Determination of Bleeding Time and Clotting Time.

INTRODUCTION TO OPERATION THEATRE TECHNOLOGY – OTT12205

UNIT	CONTENTS
1	**Cleaning and Dusting:** Methods of cleaning, composition of dust; General care and testing of instruments - forceps, haemostatic, needle holders, knife; blade, scissor, use/ abuse, care during surgery.
2	**Disinfectants of Instruments and Sterilization:** Definition, methods, cleaning agents; Detergents, mechanical washing, ultrasonic cleaner, lubrication, inspection and pitfalls; Thermal, hot air oven, dry heat, autoclaving, steam sterilization water etc, UV treatment; Sterilization of equipments - arthroscope, gastroscope, imago lamp, apparatus, suction apparatus, anaesthetic equipments including endotracheal tubes; OT Sterilization including laminar air flow; Trouble shooting - colored spots and corrosion, staining, dust deposit, recent; amendment in EPA with reference to waste disposal.
3	**Various Methods of Chemical Treatment:** Formalin, glutraldehyde; Instrument's etching, care of micro surgical and titanium instruments.
4	Anaesthesia Service, history, pre-operative, intra operative & post operative care.
5	General anaesthesia techniques.
6	Local anaesthesia techniques.

7	Blood transfusion.
8	Monitoring in the operation theatre.
9	Positioning of patient.
10	Instrument planning for various surgical procedure and auxiliary instrumentation.
11	OT techniques, OT environment, control of infection scrubbing, theatre cloths including lead apron and goggles.
12	Duties of nurses, ethics, behaviour during surgery, etc.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Raymond John Brigden: Operating Theatre Technique : A Textbook for Nurses, Technicians, Operating Department Assistants, Medical Students, House Surgeons and Others associated with the operating theatre; Churchill Livingstone 1980.

B. Basic Surgical Techniques 5e-Raymond Maurice Kirk.

C. Manual of Surgical Equipment Sewta Rajendra Singh-Jaypee Digital.

BASIC ANESTHESIA EQUIPMENT AND DRUGS- OTT12202

UNIT	CONTENTS
1.	**Anesthesia Machine:** Boyle Machine & Its functioning.
2.	**Anesthetic Vaporizer:** Boyle Vaporizer.
3.	**Breathing and Respiration Systems:** Magill's breathing circuit; Bains breathing circuit Pediatric anaesthesia circuit.
4.	**Medical Gas System:** Gas cylinder and flow meters; Carbon dioxide absorption contester.
5.	**Suction Machines:** Suction apparatus - Foot operated, Electrically operated; Ambu bag and laryngoscope; Hand tracheal tubes; Catheters; Face masks, Ventimask, Drugs.
6.	**Anesthetic 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.
7.	**Sleep Inducing Drugs:** Sedatives & Hypnotics; Barbiturates morphine and others.
8.	**Groups of Drugs:** Important groups of drugs; NS and other IV fluids; Ibuprofen, Aspirin, Antimicrobial agents, Anti allergic drugs, Anti diuretics.
9.	**Pre-anesthetic Medication:** Pre-anesthetic medication.
10.	**Anesthetic Agents:** Local Anesthetic agents; Spinal Anesthetic agents; General Anesthetic agents.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Anesthesia: A Comprehensive Review by Brian A. Hall, Robert C. Chantigian

B. Manual of Anaesthesia By Paul Arun Kumar-Jaypee Digital

POST ANESTHESIA CARE UNIT (PACU) - OTT12204

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. The post anesthesia care unit: a critical care approach to post anesthesia nursing, Volume 1 Cecil B. Drain

B. http://www.eba-uems.eu/resources/PDFS/Quality_and_safety_guidelines_of_postanaesthesia.1.pdf

GENERAL PRINCIPLES OF HOSPITAL PRACTICE AND PATIENT CARE – HHM12201

UNIT	CONTENT
1	**Hospital Structure and Organization:** Overview of hospital structure, hospital procedure, professional qualities; Communication and relational skills –development of appropriate communication skills with patients, verbal and non verbal communication, appearance and behavior; Professional attitude of the technologist to patients and other members of the staff; Records and reports – records relating to patients and departmental statistics; Minimizing waiting time out- patient and follow-up clinics, stock-taking and stock keeping; Administrative policies and disciplinary procedures; Importance of reporting.
2	**Care of Patient:** Contact with the patient and family members in the respective department; Communication with the patient and family members; Patient transfer technique; Restraint techniques – consideration to be taken for the geriatric, paediatric, trauma, emotionally disturbed, and anaesthetized patients; Specific patient conditions – essentials of care of patients on ventilator, tracheostomy, tubes and catheters, nasogastric tubes, chest tubes, intravenous lines, oxygen & casts; Basics on hygiene and maintenance of hygiene; Essential

	care of patient with a colostomy, providing bed pans and urinals; Basics of nursing care – measurement of vital signs – sterile dressing.
3	**First Aid and Basic Life Support:** Aims and objectives of first aid; wounds and bleeding, dressing and bandages; pressure and splints, supports etc. shock; insensibility; asphyxia; convulsion; resuscitation, use of suction apparatus, drug reactions; prophylactic measures; administration of oxygen; electric shock; burns; scalds; haemorrhage; pressure points; compression band. Fractures; splints, bandaging; dressing, foreign bodies; poisons. Introduction to BLS, indications for BLS, and the process of BLS. Recovery position.
4	**Infection Control Practices:** Definition – introduction to the types of micro organisms – Bacteria – their nature and appearance – spread of infections – auto-infection or cross infection; asepsis and antisepsis; Infection pathogens; Communicable diseases cross infection and prevention, patient hygiene, personal hygiene, departmental hygiene, handling of infectious patients in the department; Application of asepsis, inflammation and infection process; Hospital acquired infection; Universal precautions and biomedical waste management.
5	**Principle of Asepsis:** Sterilization – methods of sterilization; use of central sterile supply department of instruments, surgical dressing in common use including filamented swabs, elementary operating theatre procedure, general abdominal preparation, clothing of a patient.
6	**Maintenance of Medications in the Department:** Storage: classification; labeling and checking, regulations regarding dangerous and other drugs; units of measurements, special drugs, anti-depressive, anti-hypertensive etc.
7	**Specialized Investigations:** Care of patients - patients care during investigation; GI tract, renal tract, biliary tract, respiratory tract, gynecology, cardiovascular, lymphatic system, CNS.
8	**Medico – Legal Issues:** Medico – Legal considerations – clinical and ethical responsibilities, ethical law and professional etiquettes applied to members of profession associated with medicine, misconduct and malpractice; Handling female patients, practice in pregnancy – decision making.
9	**Nursing, Handling and Care of Patients:** Hospital and developmental procedure; Hospital staffing and organization, records and departmental statistics, appoints, stock taking and stock keeping, reception, elementary hygiene.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Francis (2000). Hospital Administration, 3rd Ed. Jaypee, New Delhi.

B. Malhotra, A.K. (2009). Hospital Management: An Evaluation. Global India Publication, New Delhi.

C. Dr. Sanjeev K. Singh, Dr. Shakti Kumar Gupta, Col. Dr. Sunil Kant, Hospital Infection Control Guidelines-Principles and Practices, Jaypee Brothers, New Delhi.

WEB LINKS:

A. http://smallbusiness.chron.com/organizational-structure-hospitals-3811.html.

B. http://www.healthit.gov/providers-professionals/electronic-medical-records-emr.

C. http://meded.ucsd.edu/clinicalmed/clinic.htm.

CLINICAL PRACTICAL TRAINING-O.T. (P) – TRN12201P

Practical I

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^{o}C.

Practical II

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.

ADVANCED O.T. INSTRUMENT CARE & MAINTENANCE – (P) TRN12202P

Practical I

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.

Practical II

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 attachments as well as their maintenance, Assisting with Anesthesiologist, Observing and monitoring the patient in recovery room, Terminal disinfection.

ENVIRONMENTAL & BIOMEDICAL WASTE MANAGEMENT-WCM12301

UNIT	CONTENTS
1.	**Environment Introduction:** 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:** Bio Medical Waste Management; Introduction to bio medical waste; Types of bio medical waste; Collection of bio medical waste.
5.	**Land Pollution:** Land Pollution; Soil conservation; Land erosion; Afforestation.
6.	**Ecology:** Ecology; Basics of species; Population dynamics; Energy flow; Ecosystems; Social Issues and the Environment; Sustainable development and Life Styles; Urban problems 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.	**Renewable Sources of Energy:** Non-Conventional (Renewable) source of energy; Solar Energy; Wind energy; Bio mass energy and 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-OTT12301

UNIT	CONTENTS
1.	**Introduction of Surgery:** Introduction of surgery and basic principles of surgery; Cancer - 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; Breast Cancer - 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.	**O.T. Maintenance:** 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 forceps, 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.	**Sterilization and Maintenance:** 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. Basic Surgical Techniques 5e-Raymond Maurice Kirk.

B. Manual of Surgery, Volume 1: General Surgery by Alexis Thomson, Alexander Miles

Publisher: Morrison and Gibb 1921.

BASIC SURGERY, SURGICAL EQUIPMENTS & MACHINERY (P) – OTT12301P

Practical I

Identification & Demonstration of working of the equipment, Fumigation, Cleaning and disinfection of articles, packing articles for sterilization, and Sterilization of equipments.

Practical II

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.

Practical III

Advanced O.T. Table & Their attachment as well as their maintenance, assisting with Anesthesiologist, Observing and monitoring the patient in recovery room, Terminal disinfection.

BASIC ANESTHESIA TECHNOLOGY- OTT12302

UNIT	CONTENTS
1.	**Anesthesia Gas:** 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:** 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 of Breathing system; Mapleson breathing system; Jackson Rees system; Bain circuit; Non breathing valves – Ambu valves, Others.
7.	**Gas Analyzers:** Pulse Oximeter; CO2 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 tracheotomy decannulation; Face masks – Types; sizes and its usage.
10.	**Anesthetic Equipment Maintenance:** 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. Manual of Anaesthesia By Paul Arun Kumar-Jaypee Digital

B. The post anesthesia care unit: a critical care approach to post anesthesia nursing, Volume 1 Cecil B. Drain

ADVANCED ANESTHESIA TECHNOLOGY- OTT12303

UNIT	CONTENTS
1.	**Anesthesia Machine:** 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 contester; Suction apparatus - Foot operated, Electrically

	operated, Ambu bag laryngoscope; Hand tracheal tubes, Catheters, Face masks, Venti mask drugs, General Principles; Anesthetic Drugs - 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:** Sedatives & Hypnotics, Barbiturates morphine and others; Important groups of drugs; NS and other IV fluids ibuprofen, Aspirin, Antimicrobial agents Anti allergic drugs ant diuretics; Pre-anesthetic medication, Local Anesthetic agents, Spinal Anesthetic agents, General Anesthetic agents.
3.	**Medical Ethics:** 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.	**Computer Application:** Basics of computer application; Basic structure of computers; Micro processors in computers; Principles of computer and its application in various fields.
5.	**Medical Statistics:** 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.	**Waste Management and Safety:** 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.
7.	**Anesthesia:** History of Anesthesia; Introduction; Antecedents of modern anesthesia; Evolution of modern anesthesia; Anesthesia Operating Room; Dye allergies; Embolization; Examination for magnetic resonance imaging (MRI); Monitoring; Equipment options in the MRI suite; General anesthetic/sedation techniques.
8.	**Mental Sickness and Cardiology:** 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.	**Anesthetic Techniques:** 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; Different anesthetic options-advantages and disadvantages of each; Irrigation fluid options, 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. The post anesthesia care unit: a critical care approach to post anesthesia nursing, Volume 1 Cecil B. Drain

B. The Anesthesia Technician and Technologist's Manual: All You Need to Know By Glenn Woodworth

ADVANCED ANESTHESIA TECHNOLOGY (P) – OTT12303P

Practical I

Medical ethics, Medico legal aspects; Basics of Computer application; Basic of Medical statistics; Biomedical wastes, Electricity and electro medical equipments; Fire and explosion, History of anesthesia, Physics in principles of Anaesthesia machine, Boyle's machine in details.

Practical II

Pipeline system, Anaesthesia gases, Vaporizers, Anaesthesia gadgets, Different types of endotracheal tubes and endobroncheal tubes, Breathing circuits, General anaesthesia, Neuromuscular blocking drugs, Monitoring in anaesthesia.

APPLIED ANESTHESIA TECHNOLOGY- OTT12304

UNIT	CONTENTS
1.	**Anesthesia System:** 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.	**Anesthesia Gadgets:** 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 anesthesia.
3.	**Anesthesia Drugs:** 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.	**Anesthetics:** Neuromuscular blocking agents used in anaesthesia practice; Inhalation anaesthetics, Nitrous oxide, Diethyl ether, Halothane, Enflurane, Isoflurane, Sevoflurane, Desflurane-there indications and complications; Intra-operative management; Monitoring during anaesthesia by use of monitors.
5.	**Anesthesia Monitoring:** Monitoring during anaesthesia; Clinical monitoring by use of monitor; Patient Monitoring - Arterial blood pressure monitoring; Electrocardiogram, Pulse oximetry, Capnography, Neuromuscular monitoring etc., Monitoring during shifting of the patient from operation theater to post operative care unit, Monitoring of the patient in postoperative care unit; Complications in the postoperative period and acute pain management in postoperative ward.
6.	**Regional Anesthesia:** Regional Anaesthesia - Local anaesthetic agents used in regional anaesthesia, Indications, Contraindications, Dosage, Complications, Route of administrations example Lignocaine, Bupivacaine etc; Regional anaesthesia, Spinal anaesthesia in all age group of patients, Indications and Contraindications; Commonly used local anaesthetics, Adjuvants; Epidural anaesthesia, Epidural anaesthesia in all age group of patients.
7.	**General and Caudal Anesthesia:** 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 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. The Anesthesia Technician and Technologist's Manual: All You Need to Know By Glenn Woodworth

B. Manual of Anaesthesia By Paul Arun Kumar-Jaypee Digital

APPLIED ANESTHESIA TECHNOLOGY (P) – OTT12304P

Practical I

Attending preoperative rounds with anaesthesiologists; Attending postoperative rounds with anaesthesiologists; Attending pain clinic everyday with anaesthesiologists; Attending rounds in ICU, ICCU, MICU, SICU with anaesthesiologists and understanding Ventilators, its implication and sterilization; Attending regular operation theatre for regular anaesthesia cases; Attending emergency cases along with anaesthesiologists.

Practical II

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.

Practical III

Airway gadgets arrangements during anaesthesia procedures like Oropharyngeal airways, Nasopharyngeal airways, Endotracheal tubes and Laryngeal mask airways etc. ;Anaesthesia Vaporizers to be filled and make arrangements for inhalation; 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.

HOSPITAL TRAINING – TRN12301