OPJS UNIVERSITY,CHURU(RAJASTHAN)

SYLLABUS

For

B.Sc. in Operation Theater Technology

BSc.OTT

(Academic Program)

School of Para-Medical Science

OPJS UNIVERSITY, CHURU (RAJASTHAN)
2016-17

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BSc.OTT (BSc in OPERATION THEATRE TECHNOLOGY) SYLLABUS

FIRST YEAR

Course Code	Course Title	Distribution of Marks	
		Theory/Practical	Continuous Assessment
BOT-101	Anatomy	70	30
BOT-102	Physiology	70	30
BOT-103	Biochemistry	70	30
BOT-104	Pathology	70	30
BOT-105	Microbiology	70	30
BOT-106	Communication Skills & Personality Development	70	30
BOT-107	Fundamentals of Computer Science	70	30
BOT-108	Hospital Training	70	30
	TOTAL	**800**	

SECOND YEAR

Course Code	Course Title	Distribution of Marks	
		Theory/Practical	Continuous Assessment
BOT-201	Applied Pathology	70	30
BOT-202	Applied Microbiology	70	30
BOT-203	Introduction to Operation Theater Technology	70	30
BOT-204	Pharmacology	70	30
BOTT205	Medicines Relevant to OT Technology	70	30
BOTT206	Environmental Sciences	70	30
	TOTAL	**600**	

THIRD YEAR

Course Code	Course Title	Distribution of Marks	
		Theory/ Practical	Continuous Assessment
BOTT301	Operation Theater Technology-Clinical	70	30
BOTT302	Operation Theater Technology-Applied	70	30
BOTT303	Operation Theater Technology-Advanced	70	30
BOTT304	Research and Biostatistics	70	30
BOTT305(IT	Industrial Training	70	30
	TOTAL	**800**	

Detailed Syllabus

First Year
BOT-101- Anatomy

Unit1. Introduction to Anatomy:

- Introduction to anatomy
- Surface anatomy, cadverial anatomy, anatomical planes
- Anatomical movements, anatomical positions.
- Cells and Tissues, their types
- Structure of an animal cell with functions of the cell organelles, functions of cells and tissues
- Clinical terminologies related to above

Unit2.Musculo-Skeletal System:

- Definition/introduction of skeletal system, bones and their types
- Structure of a cancellous bone and cartilaginous bone
- Classification of bones on the basis of shape and origin
- Functions of musculo-skeletal system, introduction to tendons
- Ligaments and cartilages
- Joints: definition of joints, functions, types of joints, cartilaginous and fibrous joints, sutures
- Synovial joints and their subtypes with suitable examples, fontanelles etc.
- Relevant clinical notes

Unit3.Cardiovascular System:

- Heart-size, shape, location, internal structure, arterio-venous supply
- The Systemic or grater circulation & lesser or pulmonary circulation
- Branches of aorta-brachiocephalic artery, subclavian artery, common carotid artery, Circle of Willis
- Axillary artery, superficial palmar arch, femoral artery, internal iliac artery, inferior vena cava, portal vein
- Great saphenous vein & dural venous sinuses
- Relevant clinical notes

Unit4.Gastro-intestinal System:

- Anatomical structure of oral cavity (Teeth, lips, tongue, hard palate, pharynx, tonsil, salivary glands, Waldeyer's ring
- Esophagus, stomach, small and large intestine, liver, gall bladder, pancreas
- Spleen- overview of gross anatomy
- Introduction to regions of abdominal cavity
- Relevant clinical notes

Unit5.Respiratory System:

- Overview of anatomical structures of respiratory system- nose, nasal cavity, pharynx, larynx, trachea, lungs & bronchial tree (including histology of trachea, lung and pleura)
- Para-nasal air sinuses
- Clinical terminologies related to Respiratory System

Unit6.Urinary System:

● Anatomical overview of excretory system-kidney, ureter, urinary bladder, male and female urethra with histology perspective of kidney, ureter and urinary bladder
● Clinical terminologies pertaining to excretory system

Unit7.Reproductive System:
● Anatomical parts of male reproductive system- scrotum, testis, vas deferens, epididymis, prostate (gross & histology), ejaculatory duct
● Parts of female reproductive system- perineum, vagina, uterus, fallopian tubes, ovary (gross & histology), gross anatomy of mammary glands.
● Clinical terminologies related to reproductive system

Unit8.Endocrine Glands:
● Gross anatomical structure of pituitary and thyroid gland, anatomical overview of thyroid, parathyroid gland, suprarenal glad
● Clinical terminology related to Endocrine System

Unit9.Nervous System:
● Introduction to Central and Peripheral Nervous System, Neuron, Classification of Nervous System, gross anatomy of cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerves
● Meninges and subdural spaces, ventricles & cerebrospinal fluid, basal ganglia, nuclear ganglia
● Blood supply of brain, cranial nerves
● Sympathetic and parasympathetic nervous system
● Clinical terminologies related to Nervous System

Unit10.Sense Organs:
Gross anatomical structure of Eye, Ear, Nose, Tongue and Skin, Lacrimal apparatus, blood and nerve supply to the above parts
● Clinical terminologies related to above

BOT-102- PYSIOLOGY

Unit1. Composition and Function of Blood:

● Red Blood Cells – Erythropoiesis, Normal RBC count physiological variations. Hemoglobin –functions, normal value, concentration, physiological variation, methods of estimation of Hemoglobin

● White Blood Cells – Production, function, life span, count, differential count.

●Platelets – origin, normal count, morphology functions

●Plasma Proteins – Production, concentration, types, Albumin, Globulin, Fibrinogen, Prothrombin functions

●Hemostasis – Definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors

Blood groups – ABO system, Rh system. Blood grouping & typing. Cross matching. Rh system – Rh factor, Rh incompatibility

●Blood transfusion- indication, universal donor and recipient concept, selection criteria of a blood donor, transfusion reactions, anticoagulants, classification, examples and uses of anticoagulants

●Anaemias: definition, causes, classification, effects of anemia on body

●Blood indices- colour index, MCH, MCV, MCHC, erythrocyte sedimentation rate (ESR) and packed cell volume, normal values, definition and determination.

● Blood Volume -normal value, determination of blood volume and regulation of blood volume

● Body fluid – pH, normal value, regulation and variation, Lymph – lymphoid tissue formation, circulation, composition and function of lymph

Unit2. Cardiovascular System:

●Heart –Properties of Cardiac muscle, systole, diastole, heartbeat, stroke volume, cardiac output, heart sounds, heart murmur, normal heart sounds, characteristics and signification, heart rate, tachycardia and brady cardia, cardial ischemia, myocardial infarction,

●Blood Pressure– definition, normal value, hypo and hypertension and its causes, clinical measurement of blood pressure, physiological variations, regulation of heart rate, cardiac shock, pulse and pulse rates, radial pulse, triple response Electrocardiogram (ECG) & its significance.

Unit3. Digestive System:

●Physiological anatomy of Gastro intestinal tract, functions of digestive system

● Salivary glands, saliva and digestive functions of saliva, deglutition mechanism,

● Composition and functions of Gastric juice, regulation of gastric juice secretion

●Pancreatic juice- composition, functions, secretion and regulation of secretion,

●Liver – functions of liver, composition, function and secretion of bile juice

●Functions of Gall bladder, small intestine and large intestine, physiology of digestion, absorption and assimilation

Unit4. Respiratory System:

●Functions of Respiratory system, stages of respiration, physiology of gaseous exchange, factors opposing and favoring expansion of the lungs, intra pulmonary pleural pressure, ●Transportation of Oxygen, quantity of Oxygen transported., inspiratory volume, tidal volume, reserve volume and dead space, regulation of respiration, the respiratory centre. ● Related clinical terminologies viz. hypoxia, cyanosis, asphyxia, dyspnoea, dysbarism, artificial respiration, apnea etc.

Unit5. Endocrine System:

- Physiological function, regulation of secretion of important hormones of Pituitary gland (anterior and posterior pituitary) , thyroid gland and adrenal glands, disorders like hypo and hyper secretion of hormone.
- Functions of hormones secreted by pancreas e.g. insulin and glucagon, diabetes mellitus and regulation of blood glucose level. Secretion and functions of parathyroid hormone, secretion and functions of calcitonin

Unit6. Nervous System:

- Functions of Nervous system, structure and functions of Neuron, classification and properties of Neuroganglia, conduction of impulses continuous and salutatory, reflex action, unconditioned properties of reflex action
- EEG
- Cerebrospinal Fluid (CSF): formation, circulation, properties, composition and functions, procedure of lumbar puncture.

Unit7. Excretory System:

- Mechanism of Urine formation, Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR, determination of GFR
- Selective reabsorption – sites of reabsorption, substance reabsorbed and mechanisms of reabsorption of glucose, and urea, H+Cl amino acids etc.
- Properties and composition of normal urine, urine output. abnormal constituents in urine, mechanism of urine concentration.
- Counter– Current Mechanisms: Micturition, Innervation of urinary bladder
- Diuretics: Water, Diuretics, osmotic diuretics, artificial kidney, renal function tests (RFT)

Unit8. Reproductive System:

- Function of male reproductive system- functions of testes, spermatogenesis site, stages, and factors influencing semen, Endocrine functions of testes,
- Functions of female reproductive system- ovulation, menstrual cycle, physiological changes during pregnancy, pregnancy test, lactation, factors controlling lactation.

BOT-103- BIOCHEMISTRY

Unit1. Specimen Collection: Pre-analytical variables, Collection of blood, Collection of CSF & other fluids, Urine collection, Use of preservatives, Anticoagulants.

Unit2. Introduction to Laboratory Equipmentation

● Pipettes & its different types (Graduated, volumetric, Pasteur, Automatic etc.), calibration of glass pipettes, burettes, beakers, petri dishes

● Introduction to various types of funnels, flasks, reagent bottles, wash bottles, specimen bottles, measuring cylinders, porcelain dishes, test tubes and tube racks

● Tripod stand, wire gauze, bunsen burner, cuvettes and its significance in colorimeter,

●Orientation to desiccator, stop watch, scissors, dispensers and other apparatus which is important to conduct biochemical tests/experiments

● Maintenance of lab glass ware and apparatus, significance of boro silicate glass, care and cleaning of glass ware, different cleaning solutions of glass ware, care and cleaning of plastic ware, different cleaning solutions for cleaning the plastic ware

Unit3. Instruments

● Use, care and maintenance of water bath, hot air oven, incubators, water distillation plant and deionizers

● Use, care and maintenance of refrigerators, cold box, deep freezers

● Use, care and maintenance of reflux condenser, centrifuges, svedberg unit, centrifugal force, centrifugal field rpm, different types of centrifuges,

● Laboratory balances- Manual and digital weighing balances, single pan, double pan. direct read out electrical balances, weighing different types of chemicals, liquids, hygroscopic compounds etc

● Principles, use, care and maintenance of colorimeter and spectrophotometer, pH meter, types of electrodes, salt bridge solution and precautionary guidelines to be followed while using pH meter.

Unit4. Measurement and Preparation of Solutions

● Molecular weight, equivalent weight of elements and compounds

● Normality, molarity and molality of solutions

● Preparation of molar solutions (mole/litre solution), preparation of normal solutions

● Percent solutions, preparation of different solution– v/v, w/v and conversion of a percent solution into a molar solution

Unit5. Dilutions

● Diluting solutions, preparation of working standard solutions from stock standard, body fluid dilutions, reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc.

● Saturated and supersaturated solutions. standard solutions, technique for preparation of standard solutions e.g.: Glucose, urea, etc.,

● Significance of volumetric flask in preparing standard solutions, volumetric flasks of different sizes, preparation of standard solutions of deliquescent compounds, preparation of standards using conventional and SI units

Unit6. Acids, Bases, Salts and Indicators

● Acids and Bases: Definition, physical and chemical properties with examples, classification of acids and bases, difference between bases and alkali, acidity and basicity, concepts of acid base reaction

● Hydrogen ion concentration, ionization of water, buffer, pH value of a solution, preparation of buffer solutions using pH meter

● Salts: definition, classification, deliquescent and hygroscopic salts

● Acid- base indicators- definition, concept, mechanism of dissociation of an indicator, color change of an indicator in acidic and basic conditions, use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range, suitable pH indicators used in different titrations, universal indicators.

Unit7. Quality Control

● Accuracy, precision, specificity, sensitivity, limits of error allowable in laboratory, percentage error, normal values and interpretations

Unit8. Special Investigations

● Basic principles and estimation methodology of estimation of carbohydrate, plasma protein, glucose, enzymes, electrolytes, lipids and fats, the renal function test and liver function test

Unit9. Nutrition

● Nutritional support with special emphasis on parental nutrition, calorific value, nitrogen balance, respiratory quotient, basal metabolic rate, dietary fibers, nutritional importance of lipids, carbohydrates, proteins and vitamins

PRACTICAL COMPONENT

1. Analysis of Normal Urine.
2. Composition of urine.
3. Procedure for routine screening.
4. Urinaryscreening for inborn errors of metabolism.
5. Common renal disease.
6. Urinar calculus.
7. Urine examination for detection of abnormal constituents.
8. Interpretation and Diagnosis through charts.
9. Liver Function tests.
10. Lipid profile.
11. Rena function test.
12. Cardiac markers.
13. Blood gas and electrolytes.
14. Estimation of blood sugar, Blood Urea and electrolytes.
15. Demonstration of Strips.
16. Demonstratio of Glucometer.
17. Titration .

BOT-104- PATHOLOGY

Unit1. Hematology

●Introduction to Hematology, normal constituents of blood and their function, blood grouping, rH typing, universal donors and universal recipient, collection of blood samples

● Various anticoagulants used in Hematology, various instruments and glassware used in Hematology, estimation methodology of Hb, Blood grouping, PCV, ESR, MCH, HCHC etc.

● Normal Hemostasis, bleeding time, clotting time, prothrombin time, activated partial thromboplastin time etc.

Unit2. Histopathology

● Introduction to Histopathology, receiving Specimen in the laboratory, grossing techniques, mounting techniques, various mountants

● Maintenance of records and filing of the slides

● Use & care of Microscope

● Various fixatives, mode of action, preparation and indication

● Biomedical waste management

● Section Cutting

● Tissue processing for routine paraffin sections

●Decalcification of tissues

● Staining of tissues- H& E Staining

Unit3. Clinical Pathology

●Introduction to clinical pathology, collection, transport, preservation and processing of various clinical specimens,

● Urine Examination- collection and preservation of urine, physical, chemical, microscopic examination

● Examination of body fluids-examination of cerebrospinal fluid (CSF)

●Sputum Examination

●Examination of faeces

PRACTICAL COMPONENT

● Urine Examination: Physical, Chemical, Microscopic

● Blood Grouping, Rh typing

● Hb Estimation, Packed Cell Volume [PCV], Erythrocyte Sedimentation Rate (ESR)

● Bleeding Time, Clotting Time

● Histopathology – Section Cutting and H &E Staining

BOT-105- MICROBIOLOGY

Unit1. General & Clinical Morphology
●Introduction and definition, branches of microbiology, introduction and definition of microbes, virus, bacteria and microorganisms, size, shape and structure of bacteria and virus, use of microscope in the study of bacteria

Unit2. Growth and Nutrition:
●Nutrition, growth and multiplication of bacteria, common bacterial diseases, use of culture media in diagnostic bacteriology.

Unit3. Sterilization and Disinfection:
●Introduction and importance, principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator
● Pasteurization, antiseptic and disinfectants
● Antimicrobial sensitivity test.

Unit4. Immunology:
●Immunity- vaccines, types of vaccine and immunization schedule
●Principles and interpretation of commonly done serological tests like Widal, VDRL, ASLO, CRP, RF & ELISA
●Rapid tests for HIV and HbSAg

Unit5. Systematic Bacteriology:
●Morphology, cultivation, diseases caused by bacteria, laboratory diagnosis including specimen collection of Staphyloccci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochaetes.

Unit6. Parasitology:
●Morphology, life cycle, laboratory diagnosis of E. histolytica, Plasmodium Vivax, Bucheria bancrofti, tape worms and intestinal nematodes.

Unit7. Mycology:
●Morphology, diseases caused and lab diagnosis of fungi like candida, cryptococcus, dermatophytes etc., opportunistic fungi

Unit8. Virology:
●General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses: Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

Unit9. Nosocomial Infection:
● Causative agents, transmission methods, investigation, prevention and control of Nosocomial/Hospital infection, principles and practice, biomedical waste management.

PRACTICALS

●Compound Microscope
●Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters
●Demonstration of commonly used culture media: Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac-conkey medium, LJ media, Robertson Cooked meat media, Potassium telluride, media with growth, Mac with LF & NLF, NA with staph
●Antibiotic susceptibility test
●Demonstration of common serological tests – Widal, VRDL, ELISA. Grams stain, Acid fast staining
●Stool exam for Helminthes ova
●Visit to hospital for demonstration of bio-medical waste management
●Anaerobic culture methods

BOT-106-COMMUNICATION SKILLS & PERSONALITY DEVELOPMENT

Unit1. Introduction:

- ●Communication
- ● Types of Communication
- ● Importance & Principles of Communication
- ●Barriers in Communication

Unit2. Review of Grammar

- ●Types of Sentence
- ●Parts of Speech in brief
- ●Transformation and Synthesis of Sentences
- ●Verb and Tense Forms
- ●Voice
- ●Direct & indirect speech
- ●Phonetics

Unit3. Vocabulary

- ●Medical Terminology
- ●Idioms and Phrases
- ●Common Errors
- ●Use of Dictionary for Learning to Pronounce
- ●Word Formation by adding Prefixes & Suffixes

Unit4. Spoken English

- ●Audience Psychology & Presentation Skills
- ●Using Non-verbal Communication
- ●Interview techniques
- ●Discussion
- ●Debate
- ●Telephonic Conversation

Unit5. Writing Skills

- ● Précis Writing
- ●Letter Writing
- ●Curriculum Vitae Writing
- ●Listening, Reading, Comprehension (Exercise of prescribed short answers)
- ●Preparation of Report
- ●Note Taking and Note Making

BOTT-107-FUNDAMENTALS OF COMPUTER SCIENCE

Unit1. Computer Fundamentals

● Introduction to computers, history, generations & classification of computers

●Computer memories, input & output devices

●Virus & antivirus, block diagram of computer, programming languages in computer (HLL & LLL), translation (assembler, interpreter & compiler)

Unit2. Operating systems

● Introduction to operating system,

● Attachment Unit Interface (AUI), Graphical User Interface (GUI), Character User Interface (CUI)

Unit3. Disk Operating System (DOS)

● Introduction to DOS, commands used in DOS & functioning

Unit4. MS-Window

● Introduction & features of window, window accessories like Notepad, MS-paint, Word pad, Calculator etc.

Unit5. Word Processor (MS-Word)

● Introduction, creating, saving & editing a document, tabular techniques, uses of tools & menu operations in MS-word.

Unit6. Spread Sheet (MS- Excel)

● Introduction to MS-Excel, parts of MS-Excel screen, formatting techniques, use of functions & formulae, linking & sharing of work sheets, uses of Charts & Graphs.

Unit7. Presentations (MS-Power Point)

● Introduction, working with tool bar, editing a slide, slide layouts, working with slides, slide

●Transition & Animation, inserting sounds in a power point presentation, creating tables & organization charts.

Unit 8 Internet

● Introduction, creating an e-mail ID on internet, uses of internet in e-mail, World Wide Web (www), chats etc.

PRACTICAL COMPONENT

● Introduction to word

● Creating & saving a document

● Using tabular techniques, making tables, adding & deleting rows & columns

●Editing a document

● Using different tool bars & options in MS-word

●Introduction to MS-excel

●Formatting techniques

● Use of functions and formulae in MS-excel

● Linking & sharing of worksheets

● Use of charts & graphs

● Introducing MS-Power Point

●Working with the tool bars

● Editing a slide

● Slide Transition & Animation

● Inserting Sound in a power point presentation

●Creating tables & organization charts

● Using various options on internet, creating e-mail account, using e-mail, World Wide Web, chatting etc.

SECOND YEAR

BOT-201-APPLIED PATHOLOGY

Unit1. Cardiovascular System:
Definition, causes, brief pathogenesis and morphology, types (if any), risk factors, clinical significance, effects and preventive measures of the following cardio vascular diseases
● Atherosclerosis
●Hypertension
●Aneurysms
● Cardiac hypertrophy
● Ischemic heart diseases
● Valvular Heart diseases
● Cardiomyopathy
● Pericardial effusion
● Congenital heart diseases
● Pathophysiology of heart failure

Unit2. Hematology:
Definition, causes, brief pathogenesis, types (if any), risk factors, clinical significance, diagnosis and preventive measures of the following hematological disorders:
●Anaemia
● Hypervolemia
● Leukemia, leukocytosis and agranulocytosis
●Bleeding disorders

Unit3. Respiratory System:
Definition, causes, brief pathogenesis, types (if any), risk factors, clinical significance, diagnosis and preventive measures of the following hematological disorders
●Chronic Obstructive Pulmonary Diseases (COPD)
● Dispnoea
● Bronchitis and bronchiectasis
● Pulmonary Edema
●Bronchospasm and respiratory arrest
● Brief concept about pulmonary obstructive versus pulmonary restrictive diseases

Unit4. Renal System:
Clinical significance of renal diseases briefly causes, mechanism, effects and laboratory diagnosis
● Hydronephrosis
● Obstructive Uropathies
● Renal failure
● VUR
● ARF & CRS
● Brief overview of role of dialysis and renal transplantation in management of end stage renal diseases

Practical Component

Diagnosis of the followings:

- Atherosclerosis
- Aortic aneurysm.
- Myocardial infraction.
- Emphysema
- Chronic glomerulonephritis.
- Chronic pyelonephritis.

Interpretation & diagnosis of the following charts.

- Hematology Chart - AML, CML, Hemophilia, Neutrophilia and Eosinophilia.
- Urine Chart - ARF, CRF, Acute Glomerulonephritis
- Estimation of Hemoglobin
- Estimation Bleeding & Clotting time.

BOT-202-APPLIED MICROBIOLOGY

Unit1. **Nosocomial Infections and Antimicrobial Resistance**

● Introduction to measure Nosocomial or hospital acquired infections like methicillin resistant Staphylococcus aureus infections, infections caused by Clostridium difficile, Vancomycin resistant Enterococci, etc.
● Catheter related blood stream infections
● Ventilator associated pneumonia
● Catheter Related urinary tract infections

Unit2. Communicable diseases in Healthcare Set-up and its Prevention:

● Occupationally and occasionally acquired infections in healthcare professionals by respiratory route
- Tuberculosis, varicella-zoster, respiratory syncytial virus
● Blood borne transmission
- HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc.
● Oro-faecal route of transmission of acquired infection
- Salmonella typhii, Hepatitis A etc.
● Transmission through direct contact
- Herpes, Simplex Virus etc.
● Preventive measures to combat the spread of these infections by monitoring and control

Unit3. Microbiological Surveillance and Sampling:

Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis and also to assess the antimicrobial resistance. Sampling: rinse technique, direct surface agar plating technique.

Unit4. Importance of Sterilization:

● Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods.
● Disinfection of the patient care unit
● Infection control measures for ICU's.

Unit5. Sterilization:

● Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
●Equipments of sterilization: classification of the instruments and appropriate methods of sterilization.
● CSSD (Central Sterile Supply Department): the floor areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas

Unit6. Preparation of Materials for Autoclaving:

● Packing of different types of materials, loading, holding time and unloading.

PRACTICAL COMPONENT

Principles of autoclaving & quality control of Sterilization
●Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing
●Various methods employed for sterility testing
●Interpretation of results of sterility testing
●Disinfection of wards, OT and Laboratory

BOTT-203-INTRODUCTION TO OPERATION THEATRE TECHNOLOGY

Unit1 Orientation to Operation Theater

● Introduction
● Management of Operation Theater
● Single and Multiple Theatre Units
● Elective and emergency surgeries
● Ambulatory surgery.

Unit2- Principles of Surgical Hygiene

●Carbonization and Fumigation
●Scrubbing, growing, gloving
●Preparation the sterile field
●Skin Preparation of patient
●Preparation of tables, equipments, instruments for surgery
●Care of operating room- before, during and after surgery
●Maintenance of Septic Theatre
●Special Precaution in handlings patients with sepsis, blood borne infection, Hepatitis B, HCV & HIV etc

Unit3- Maintaining Patient Safety and Comfort

●Maintaining patient safety & comfort in Operation Room
●Prevention of physical, electrical, chemical injuries/hazards to patient
●Clinical responsibilities of OT Technician
●Maintenance of interpersonal relationship
●Legal & Ethical responsibilities and Issues

Unit4- C.S.S.D., Logistics, Cleaning and Sterilization Techniques

● Methods of cleaning and dusting, composition of dust
● General care and testing of instruments - forceps hemostatic, needle, holders, Knife, blade, scissor, use/ abuse, care during surgery
● Definition, introduction, importance and methods of disinfection and sterilization,
● Cleaning agents: detergents, mechanical washing, ultrasonic cleaner, lubrication inspection and pitfalls.
● Various methods of chemical treatment - formalin, glutraldehvde, isopropanol etc..
● Thermal treatment
- Hot Air oven - dry heat, Autoclaving, steam sterilization water etc.
● UV treatment. Instrument's etching, care of micro surgical and titanium instruments
● Sterilization of equipments – Bronchoscope, Endoscope, Athroscope, Laryngoscope, Vulsellum Forceps, Chitten Forceps, Needles, Gastroscope, suction apparatus, anaesthetic equipments including endotracheal tubes, tracheostomy tube etc.
● OT sterilization techniques including laminar air flow
● Trouble shooting - colored spots and corrosion, staining, dust deposit etc.
● Color coding in hospital waste management

Unit5-Anesthesia Service:

● Introduction, need, effects, patient preparation
● Pre-operative, per-operative & post-operative care of anesthetic patient
● Various types of Anaestheia and their effects
● General Anaesthesia Techniques
● Local Anaesthesia Techniques
● Blood Transfusion Techniques
● Monitoring in the Operation Theatre
● Positioning of Patient

● Instrument planning for various surgical procedures

Unit6-O.T. Techniques

● O.T. environment,
● Infection control & scrubbing
● Theatre clothing's- disposable gown, gloves, cap, goggles and disposable towels/sheets

Unit7-Roles and responsibilities of an Operation Theater Technician

● Clinical responsibilities

- Maintaining the operation theater room in smooth running condition before conduct of surgery, cleaning and disinfection of surgical instruments , pre-operative, per-operative and post operative preparation and care of the patient etc.

● Legal responsibilities
●Ethical duties and code of conduct during surgeries

BOT-204- PHARMACOLOGY

Unit1-General Concepts
● Principles involved in drug activity
● Drug dose, route of administration, indications, contra-indications and adverse drug reactions
● Drugs acting on Autonomic Nervous System- anti-sialagogues, atropine, glycopyrolate and other drugs

Unit2-Cardiovascular Drugs:
A brief overview of mode of action, side effects and therapeutic uses of the following drugs:
●Antihypertensive, Beta Adrenergic antagonists, Alpha Adrenergic antagonists, Vasodilators, Peripheral Vasodilators, Calcium channel blockers, Antiarrhythmic drugs, Cardiac glycosides
● Sympathetic and non-sympathetic inotropic agents
●Coronary vasodilators, Antianginals and drugs used in congestive heart failure
● Lipid lowering & anti-atherosclerotic drugs
● Drugs used in Haemostasis, anticoagulants, Thrombolytics and antithrombolytics
● Cardioplegic drugs - Introduction, principles and types of cardioplagia, primary solutions, drugs used in the treatment of shock.

Unit3-Anesthetic Agents and Common Drugs:
● Introduction to anesthesia
● Types of anesthesia- general, local, spinal, epidural, regional, caudal and tropical anaesthesia
● General anesthesia- Dose, route and stages of GA administration, methods of GA administration, complications of GA administration and their management
● Clinical indications, dose, frequency, route of administration and counter effects of the following drugs:
-Ketamine
-Hydrocortisone
-Dopamine
-Atropine Sulphate
-Propofol
-Succinilecholine
-Sodium Thiopentone Ether
-Nitroglycerine etc

Unit4-Analgesics:
● Definition and classification, routes, dose, frequency and side effects of administration of analgesics and their management

Unit5- Anti-Histaminics and Antiemetic:
● Introduction, classification, dose, route of administration, mechanism of action, adverse effects and their management

Unit6-CNS Stimulants and Depressants:
● Alcohol, Sedatives, hypnotics and narcotics, CNS stimulants
● Neuromuscular blocking agents and muscle relaxants
● Inhalational gases and emergency drugs
● Pharmacotherapy of respiratory disorders viz. bronchial asthma, cough, bronchiectasis, Bronchospasm etc.
● Mucokinetic and mucolytic agents
● Corticosteroids- Use, classification, dose, frequency, action mechanism, side effects and their management

Unit7- Chemoprophylaxis

● Introduction, classification, action mechanism, dose, route of administration, adverse reactions and management of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol and antitubercular drugs

Unit8-Diuretics and Miscellaneous Drugs:

● Physiology of Glomerular filtration, introduction to dieuretics, clinical indications, types, dose, frequency, route of administration, mechanism of action, adverse reactions and management of adverse site of action of diuretic drugs, . Adverse effects. Preparation, dose and routes of administration.

Unit9. Miscellaneous:

Fluids - Various preparations and their usage. Electrolyte supplements, plasma expanders.Immunosuppressive agents. New drugs included in perfusion technology.

BOT-205-MEDICINES RELEVANT TO OPERATION THEATRE TECHNOLOGY

Unit1.Introduction

1.1 General introduction to Anesthesia
1.2 Different types of Anesthesia

Unit2. Anesthetic Machines

2.1 Byole's apparatus
2.2 Gas cylinders
2.3 Flow Meters
2.4 Pin Index system
2.5 Vaporizers

Unit3. Breathing Circuits

2.1 Magill's Breathing attachment
2.2 Ayre's T-Piece
2.3 Close Breathing Circuits
2.4 Co2 Absorption System

Unit4. Components of Breathing Attachments

4.1 Reservoir Bags or Ambu Bags
4.2 Breathing Tubes
4.3 Face Mask
4.4 ET tubes
4.5 ET Connectors
4.6 Laryngoscopes
4.7 Suction Apparatus
4.8 Oropharyngeal airways

Unit5. General Anesthesia

5.1 Mechanism of action of GA
5.2 Stages of GA
5.3 Complication of GA
5.4 Management of GA Complications
5.5 Methods of GA Administration

Unit6. Conduction Anesthesia

6.1 Spinal Anesthesia
6.2 Epidural Anesthesia
6.3 Caudal Anesthesia
6.4 Regional Anesthesia
6.5 Local Anesthesia
6.6 Tropical Anesthesia

Unit7. Anesthesia & OT Drugs: Use, Dose and Counter effects of the Followings:

7.1 Ketamine
7.2 Hydrocortisone
7.3 Dopamine
7.4 Atropine Sulphate
7.5 Propofol
7.6 Succinilecholine
7.7 Sodium Thiopentone Ether
7.8 Nitroglycerine etc

BOT-206-ENVIRONMENTAL SCIENCE

Environment Introduction:
Biotic and Abiotic environment, Adverse effects of Environmental Pollution, Control Strategies, Various Acts and Regulations.

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 on surface water sources, Eutrophication of lakes, Self-purification of streams.

Air Pollution:
Sources of air contamination, Adverse effects on human health, Measurement of air quality standards and their permissible limits, Measures to check air pollution, Greenhouse effect, Global warming, Acid rain, Ozone depletion.

Bio-Medical Waste Management:
Introduction to Bio-Medical Waste, Types of Bio-Medical Waste, Collection of Bio-Medical Waste, Treatment and Safe Disposal of Bio-Medical Waste.

Solid Waste Management:
Introduction to Solid Waste, Its collection and disposal, Recovery of resources, Sanitary land-filling, Vermin-composting, Hazardous waste management.

Land Pollution:
Soil Conservation, Land Erosion, Afforestation.

Ecology:
Ecology, Basics of Species, Biodiversity, Population Dynamics, Energy flow, Ecosystems.

Social Issues and the Environment:
Sustainable development and life style, Urban problems relating to energy, Resettlement and rehabilitation of people, Environmental ethics, 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. Miscellaneous issues

Renewable Sources of Energy:
Non-Conventional (Renewable) sources of energy. Solar energy. Wind energy. Bio-mass energy. Hydrogen energy

THIRD YEAR

BOT-301- OPERATION THEATRE TECHNOLOGY - CLINICAL

Unit-1: Layout Facilities

1.1 Physical Facility,
1.2 Layout of Operation theatres
1.3 Transition
1.4 Peripheral Support areas
1.5 Operating room
1.6 Special procedure rooms
1.7 Potential sources of injury to the caregiver & patient

Unit-2: Sterilization Techniques
2.1 Principles of aspects & sterile technologies
2.2 Astilse, Surgical scrub
2.3 Gowning & gloving decontamination & disinfections
2.4 Sterilization Assembly & packing
2.5 Thermal sterilization
2.6 Chemical sterilization
2.7 Radiation sterilization

Unit-3: Surgical Instrumentation & Handling

3.1 Surgical instrumentation fabrication
3.2 Classification
3.3 Powered surgical instruments
3.4 Handling instruments

Unit-4: Specialized Instruments
4.1 Specialized surgical equipment
4.2 Electro-caretery
4.3 Laser microsurgery
4.4 Ultrasonography

Unit-5: Patient Preparation for Various OT Procedures
5.1 Positioning, prepping and draping the patient
5.2 General surgery
5.3 Breast procedures
5.4 Abdominal surgery
5.5 Liver Procedures
5.6 Splenic procedures
5.7 Pancreatic Procedures
5.8 Esophageal procedures

BOT-302- OPERATION THEATRE TECHNOLOGY- APPLIED

Unit-1: Pre-Operative Patient Preparation

1.1 Pre-operative preparation of the patient.

Unit-2: Diagnostic Procedures

2.1Diagnostic procedures
2.2 Pathological examination
2.3 Radiological examination
2.4 MRI
2.5 Nuclear medicine studies
2.6 Ultrasonography
2.7 Endoscopy.

Unit-3 Anesthesia Techniques

3.1 Anaesthesia Techniques
3.2 Introduction and historical background
3.3 Types of anesthesia
3.4 Choice of anesthesia
3.5 General anesthesia
3.6 Indication of general anesthesia
3.7 Endotracheal intubation maintenance
3.8 Monitoring of Anesthetic Patient
3.9 Emergencies in Anesthesia
3.10 Balanced anesthesia

Unit-4: Anesthetic Patient Care

4.1 Care of Anaesthetized patient
4.2 Local & regional anaesthesia, common side effects and preventive care
4.3 Spinal and epidural anaesthesia, common side effects and preventive care
4.4 Intravenous anesthesia agents in aesthetic agents
4.5 Anaesthetic adjuvant drugs.

Unit-5: Anesthesia and Risk Management

5.1 Complication of general anaesthesia
5.2 Complication of local/regional anaesthesia
5.3 Management of complication due to anesthesia

Unit-6: Perfusion Anesthesia

6.1 Blood transfusion
6.2 Anaesthesia machine & central gas supply\
6.3 Difficult intubation.

BOTT-303- OPERATION THEATRE TECHNOLOGY- ADVANCED

Unit-1: Special OT Conditions
1.1 Operation Theatre Techniques for Specialty Surgery

Unit-2: Preparing for Specialized Surgical Procedures
2.1 Preparation, nursing requirements, equipments including instruments, Sutures etc
2.2 Anaesthesia techniques
2.3 Patient positioning & recovery

Unit-3: Gynecological /obstetric surgery

Unit-4: Urologic surgery, Orthopedic surgery, Neurosurgery & Ophthalmic surgery

Unit-5: Plastic and reconstructive surgery

Unit-6: Oto Rhinolaryngologic and head and neck surgery

Unit-7: Thoracic surgery, Cardiac surgery, Vascular surgery

Unit-8: Organ procurement and transplantation

Unit-9: Thyroid surgery

BOT-304- RESEARCH AND BIOSTATISTICS

Unit1. Basics of Statistics

a. Population
b. Sample
c. Variable Parameters
d. Data Collection: Primary & Secondary
e. Tabulation frequency

Unit2. Sampling Design

a. Random Sampling
b. Non-Random sampling

Unit3. Measures of Central Tendency

a. Mean
b. Median
c. Mode
d. Standard deviation
e. Co-efficient of variance

Unit4. Hypothesis Testing

a. Introduction
b. Hypothesis
c. Z- Test
d. T- Test
e. Chi Square test
f. F- Test

Unit5. General Statistics

1.1 Introduction
1.2 Types of data
1.3 Measures of central Tendency and Dispersion
1.4 Graphical Presentation of Data

Unit6. Healthcare Statistics

6.1 Introduction, definition and functions of Hospitals
6.2 Classification of Hospitals
6.3 General principles of Management (POSCORDE)
6.3.1 Planning
6.3.2 Organizing
6.3.3 Staffing
6.3.4 Co-ordinating
6.3.5 Directing
6.3.6 Evaluation
6.4 Introduction to various departments of the Hospital
6.5 Other Departments
6.5.1 Personnel Administration
6.5.2 Housekeeping
6.5.3 General Stores