

CURRICULUM FOR B.SC. OPERATION THEATRE TECHNOLOGY

(Applicable w.e.f. academic session 2022-23)

COURSE NAME: B.Sc. (OPERATION THEATRE TECHNOLOGY)

DURATION OF COURSE: THREE YEARS

FULL-TIME/ PART – TIME: FULL-TIME

**SRI GURU RAMDAS UNIVERSITY OF HEALTH
SCIENCES, SRI AMRITSAR, PUNJAB**

1. Bachelor of Science in Operation Theatre Technology

The main aim will be to train candidates in the practice of technical assistance in operation theatre techniques relevant to various surgical specialties and intensive care medicine. Along with didactic teaching, major stress will be laid on practical training in operation theatre techniques and handling of work in intensive care units by rotating them to different specialty theatres and ICU. Initially they will observe the management of work in operation theatres, later they will assist the technicians and finally they should be able to independently handle their work when posted in different operation theatres and ICU. During their period of training they shall remain attached to regular technical staff for necessary instructions, training and monitoring.

2. Duration of Course

The Bachelor of Science in Operation Theatre Technology Course is proposed to be a 3 years integrated degree course.

3. Eligibility Criteria for Admission

The students shall be admitted as per the admission criteria and qualification prescribed in the Notification issued by the Board of Management of Sri Guru Ram Das University of Health Sciences from time to time.

4. Medium of Instructions

The Medium of instruction during the course and for the university examination shall be in English.

5. Examination Scheme

- 51 The examination for the first, second and third year shall ordinarily be held twice year in the months of May/June and November/ December by the Institute as per University rules.
- 52 Annual Examination shall be held in May/June and supplementary within 6 months of annual examination.
- 53 The examination in theory/practical shall be held at the end of the 1st academic year (1st Year) and the end of 2nd academic year (2nd Year) and third exam at the end of the 3rd academic year (3rd Year) with one internal and one external examiners.
- 54 Date of examination and appointment of examiner will be made by the Board of Management on recommendation of Faculty of Medical Sciences.
- 55 The examination for the first, second and third year of B.Sc. Operation Theatre Technology Course would be held according to the prescribed syllabus.
- 56 The last dates for examination form and examination fee will be updated on University website time to time.

6. Rules of Examination for Bachelor of Science in Operation Theatre Technology Course:

- 61 The students shall submit his/her application for admission to the examination to Controller of Examinations SGRDUHS, Sri Amritsar through the Director Principal of the SGRDIMSAR, Sri Amritsar on the prescribed form with the required fee (the last

date of which will be updated on university website after notification issued from Board of Management time to time).

- 62 The candidates will be given 25 marks for theory and 15 marks for practical as internal assessment in each subject on the basis of their performance during the year. That a candidate will be eligible to appear in the examination provided he/she secured a minimum of 35% marks in internal assessment in theory and practical.
- 63 Internal Assessment must be submitted to the University at least two weeks before the commencement of theory Examination.
- 64 There will be fresh internal assessment and compulsory attendance for the students for the examination in which he/she has failed at the time of subsequent examination in that subject.
- 65 The students will not be allowed to appear in the examination unless he/she attends 75% of the total theory and practical in each subject separately.
- 66 Director Principal of the college is empowered to condone the shortage of attendance of lectures to the extent of 5% lectures delivered in each course of theory and practical.
- 67 A student will be deemed to have passed in the examination if he/she passes in each subject separately.
- 68 In case of students joining late owing to the late admission with the approval of the Vice-chancellor, their lecturers are to be counted from the date of joining. Deficiency in studies should be made up by attending special classes for them at the level of Head of the Department.

7. First Year B.Sc. Operation Theatre Technology Examination:

The First Year B.Sc. Operation Theatre Technology examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

B.Sc. Part – I

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Human Anatomy , Physiology & Pathology	75	25	100	35	15	50	150
Paper-II	Operation Theatre Equipment and Basic Techniques.	75	25	100	35	15	50	150
Paper-III	Basic Anaesthesia drugs and Techniques.	75	25	100	35	15	50	150
Paper-IV	Basic General Surgical procedures & Surgical/ Para Surgical Equipment & Skills	75	25	100	35	15	50	150
	Basics of Computer	----	-----	--	--	-----	----	-----

Note. The Examination in the subject of Basics of Computer will be conducted at college level and Grade will be sent to University for final inclusion in the result.

Grading System

Marks Range	81 - 100	76 - 80	71 - 75	61 - 70	51 - 60	41 - 50	31 - 40	0 - 30
Grade	A+	A	B+	B	C+	C	D	E

8. Second Year B.Sc. Operation Theatre Technology Examination:

The Second Year B.Sc. Operation Theatre Technology Examination shall be open to a person who has previously passed the First Year B.Sc. Operation Theatre Technology Examination of this University or an examination of any other recognized University/Institution in India considered equivalent for the purpose by the University.

B. Sc. Part – II

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Microbiology and Pharmacology	75	25	100	35	15	50	150
Paper-II	Advance Operation theatre equipment and techniques	75	25	100	35	15	50	150
Paper-III	Advanced Anaesthesia drugs and Procedures.	75	25	100	35	15	50	150
Paper-IV	Advanced surgical procedures and surgical/parasurgical equipment.	75	25	100	35	15	50	150

9. Third Year

The Third Year B.Sc. Operation Theatre Technology Examination shall be open to a person who has previously passed the Second Year B.Sc. Operation Theatre Technology Examination of this University.

B.Sc. Part-III

Paper	Subject	Theory			Practical			Grand Total
		Marks	Internal Assessment	Total	Marks	Internal Assessment	Total	
Paper-I	Operation Theatre Technology Surgical Skills - Applied	75	25	100	35	15	50	150
Paper-II	Operation Theatre Technology Surgical Skills - Clinical	75	25	100	35	15	50	150
Paper-III	Critical Care Equipment and Procedures in ICU	75	25	100	35	15	50	150
Paper-IV	Specialized Surgical Procedures	75	25	100	35	15	50	150

10. Promotion and Number of Attempts allowed

- 10.1 A candidate who fails in all the subjects in the First Year B.Sc. Operation Theatre Technology examination shall not be promoted to Second Year class.
- 10.2 A Candidate who fails in one more or more subjects will be given four attempts including first attempt as a regular candidate, plus one mercy chance at the discretion of the Vice-Chancellor, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.
- 10.3 The candidate who will absent himself/herself from the examination will be deemed to have been failed in that subject.
- 10.4 A candidate who passes in at least one subject of University level First Year B.Sc. Operation Theatre Technology examination will be permitted to attend classes of Second Year. However, the candidate will be required to pass in all subjects of 1st Year examination at least 6 months before the final examination of 2nd Year examination.
- 10.5 A candidate who fails in all subjects in the second year B.Sc. Operation Theatre Technology examination shall not be promoted to Third Year class.
- 10.6 A candidate who passes in at least one subject of University level Second Year B.Sc. Operation Theatre Technology examination will be permitted to attend classes of Third Year. However, the candidate will be required to pass in all subjects of 2nd Year examination at least 6 months before the final examination of 3rd Year examination.
- 10.7 Candidate who passes in one or more subjects of Second Year B.Sc. Operation Theatre Technology examination shall be exempted from appearing in this subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts including first attempt, as a regular candidate plus one mercy chance at the discretion of the Vice-Chancellor failing, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.
- 10.8 Candidate who passes in one or more subjects of third Year B.Sc. Operation Theatre Technology examination shall be exempted from appearing in this subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), plus one mercy chance at the discretion of the Vice-Chancellor failing, at six monthly intervals. However, he/she will have to clear all these attempts within 6 years of admission to the said course.

11. Appointments of Examiners:

- 11.1 There shall be two examiners – One internal and one external.
- 11.2 Professor & head of the Department shall be Convener. The Examiner at least 3 years post PG teaching experience in that specification field will be appointed as Internal Examiner.
- 11.3 The external examiner shall be appointed from other Universities at least 3 years post PG teaching experience in that specification field.

12. Paper Setting and moderation of Question Papers

The questions papers for 1st Year, 2nd Year and 3rd Year will be set under the direction of Controller of Examinations.

Each Question Paper covering entire course consists of seven questions out of which six questions carry 10 Marks and one question carry 15 marks.

13. Evaluation of Answer Books

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (Table marking) or any other method under the direction of the Controller of Examinations.

14. Minimum Pass Marks

During all the three annual examinations in each subject paper the candidate shall have to obtain 50% in theory, practical & internal assessment taken together.

14.1 The successful candidates shall be classified into divisions as under:

- a) Those who obtain 60% or more marks First Division.
- b) Those who obtain 50% or more marks but below 60% marks Second Division.
- c) A candidate who will obtain 75% or more marks of the total marks in any subject shall be declared to have obtained distinction in that subject provided he/she passed in all the subjects of the courses in all the parts in the first attempt.

A candidate is eligible to appear in the examination provided he/she secures a minimum of 35% marks in internal assessment in theory and practical separately.

15. Grace Marks

There shall be no provision for grace marks.

16. Declaration of Result

The results will be tabulated and declared by the Controller of Examination's office.

17. Award of Degree

On successfully passing the Third Year B.Sc. Operation Theatre Technology examination the students shall be awarded the degree of Bachelor of Sciences in Operation Theatre Technology.

First Year Syllabus

Paper-I: Human Anatomy, Physiology & Pathology

Anatomy

Theory Syllabus (50 Hours)

- **Introduction:**
 - Definition of anatomy and its divisions, Terms of location, positions and planes.
 - Cell and its organelles, Tissues & its classification, Glands.
- **Musculoskeletal system:**
 - Structure of Bone & its types.
 - Joints- Classification of joints with examples; details of synovial joint.
 - Bones & joints of upper limb, lower limb and their movements.
 - Axial skeleton & appendicular skeleton.
 - Skull, spine & its movements, intervertebral disc.
 - Muscles & its types.
 - Muscles of the upper limb, lower limb, trunk and neck.
- **Cardiovascular System:**
 - Arteries & veins, Capillaries & arterioles.
 - Heart- size, location, chambers, blood supply of heart, pericardium.
 - Systemic & pulmonary circulation.
 - Major blood vessels of Heart- Aorta, pulmonary artery, common carotid artery, subclavian artery, axillary artery, brachial artery, common iliac artery, femoral artery.
 - Inferior vena cava, portal circulation, great saphenous vein.
- **Lymphatic System:**
 - Lymph & Lymph vessels.
 - Structure of lymph node, names of regional lymphatics, axillary and inguinal lymph nodes.
- **Gastro-intestinal System:**
 - Parts of GIT, structure of tongue, pharynx, salivary glands.
 - Location & Gross structure of Oesophagus, stomach, intestine (small and large), liver, gall bladder, pancreas, spleen.
- **Respiratory system:**
 - Parts of Respiratory system; Structure of nose, nasal cavity, larynx, trachea, lungs, pleura, bronchopulmonary segments.
- **Urinary System:**
 - Parts of Urinary system, location and gross structure of kidney, ureter, urinary bladder, urethra.
- **Reproductive system:**
 - Parts of male reproductive system, gross structure of testis, vas deferens, epididymis, prostate.

- Parts of female reproductive system, gross structure of uterus, ovary, fallopian tube, mammary gland.
- **Endocrine glands:**
 - Name of all endocrine glands, gross structure & functions of pituitary gland, adrenal gland, thyroid gland and parathyroid gland.
- **Nervous system:**
 - Neuron, classification of NS.
 - Meninges, ventricles, CSF.
 - Gross features of cerebrum, midbrain, pons, medulla oblongata, cerebellum, name of basal nuclei.
 - Blood supply of brain, cranial nerves.
 - Spinal cord and spinal nerves.
 - Autonomic nervous system.
 - Visual & auditory pathways

Practical Syllabus(20 Hours):

1. **Demonstration** of all bones of the human body.
2. **Demonstration** of all organs of the human body.
3. **General Histology:**
Epithelium: Simple (squamous, cuboidal, columnar, ciliated), Stratified, Transitional.
Bone, muscles (skeletal, smooth, cardiac) • Cartilage (hyaline, elastic, fibro cartilage).
Connective Tissue (loose and dense).
Arteries (large & medium sized), Veins.

Books Recommended

1. Ross and Wilson, Anatomy and Physiology, Churchill Livingstone.
2. Companion Pocketbook for quick review B.D. Chaurasia's Human Anatomy:Vol. (1,2,3)
3. B.D. Chaurasia's Human Anatomy -Vol. (1,2,3)
4. B.D. Chaurasia's Handbook of General Anatomy
5. Textbook of Anatomy & Physiology for Nurses- Nachiket Shankar/ Mario Vaz
6. Anatomy for B.Sc. Nursing – Dr Renu Chauhan

PHYSIOLOGY

THEORY SYLLABUS (50 Hours)

- **The Cell:**
 - Cell Structure and functions of the various organelles.
 - Endocytosis and exocytosis
 - Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis)
- **The Blood:**
 - Composition of Blood, functions of the blood and plasma proteins, classification and protein.

- Pathological and Physiological variation of the RBC.
- Function of Hemoglobin
- Erythrocyte Sedimentation Rate.
- Detailed description about WBC-Total count (TC), Differential count (DC) and functions.
- Platelets – formation and normal level and functions
- Blood groups and Rh factor
- **Cardio-Vascular System:**
 - Physiology of the heart
 - Heart sounds
 - Cardiac cycle, Cardiac output.
 - Auscultatory areas.
 - Arterial pressures, blood pressure
 - Hypertension
 - Electro cardiogram (ECG)
- **Respiratory system:**
 - Respiratory movements.
 - Definitions and Normal values of Lung volumes and Lung capacities.
- **Excretory system:**
 - Normal Urinary output
 - Micturation
 - Renal function tests, renal disorders.
- **Reproductive system:**
 - Formation of semen and spermatogenesis.
 - Brief account of menstrual cycle.
- **Central Nervous system:**
 - Functions of CSF.
- **Endocrine system:**
 - Functions of the pituitary, thyroid, parathyroid, adrenal and pancreatic Hormones.
- **Digestive system (for the students of Diploma in Scope Support Technology)**
 - Physiological Anatomy of the GIT.
 - Food Digestion in the mouth, stomach, intestine
 - Absorption of foods
 - Role of bile in the digestion.

PRACTICAL SYLLABUS

1. The compound Microscope
2. Determination of ESR-By westergren's method
3. Determination of Blood Groups.
4. Measurement of human blood pressure.
5. Examination of Respiratory system to count respiratory rate and measure inspiration and respiration

Books Recommended

1. Ross and Wilson, Anatomy and Physiology, Churchill Livingstone.
2. Basics of medical physiology- D Venkatesh, HH Sudhakar
3. Textbook of anatomy and physiology for nurses-Nachiket Shankar, Mario Vaz
4. Manual of practical physiology for BDS-DR. A.K. Jain

PATHOLOGY (30 hours)

- 1) Cellular adaptation, Cell injury & cell death. Introduction to pathology.
Overview: Cellular response to stress and noxious stimuli.
Cellular adaptations of growth and differentiation.
Overview of cell injury and cell death.
Causes of cell injury.
Mechanisms of cell injury.
Reversible and irreversible cell injury.
Examples of cell injury and necrosis
- 2) Inflammation.
General features of inflammation
Historical highlights
Acute inflammation
Chemical mediators of inflammation
Outcomes of acute inflammation
Morphologic patterns of acute inflammation
Summary of acute inflammation
Chronic inflammation
- 3) Immunity disorders.
General features of the immune system
Disorders of the immune system
- 4) Infectious diseases.
General principles of microbial pathogenesis
Viral infections
Bacterial infections-Rheumatic heart disease.
Fungal infections
Parasitic infections
- 5) Neoplasia.
Definitions
Nomenclature
Biology of tumor growth benign and malignant neoplasms
Epidemiology
Carcinogenic agents and their cellular interactions
Clinical features of tumors
- 6) Environmental and nutritional disorders.
Environmental and disease

Common environmental and occupational exposures Nutrition and disease.
Coronary artery disease.

Paper II: Basic Operation Theatre Equipment and Techniques Theory Syllabus

- **Medical Gas Supply**

- Compressed gas cylinders
- Colour coding
- Cylinder valves; pin index.
- Gas piping system
- Recommendations for piping system
- Alarms & safety devices.

- **Introduction to OT equipments**

- OT- Lights
- OT Table
- Suction
- Diathermy

- Care & Maintenance of OT Equipment
- General Surgical equipment – for minor & major surgeries
- Scrubbing Techniques
- IV cannulation
- IV Fluids
- Intramuscular injections
- Cannula. Syringe needle handling
- Types of Suture Material
- Dressing materials
- Cleaning & maintenance of surgical instruments
- Packaging & storing of Surgical equipment
- Patient Handling & Shifting techniques
- Positioning of Patients for various surgical procedure
- Operation Theatre Ethics & Discipline
- Basic Nursing Care
- Recovery room care, ethics, requirements & monitoring

Paper III: Basic Anaesthesia drugs, equipment and Techniques

Theory Syllabus

- Breathing System - Common components - connectors, adaptors, reservoir bags.
 - Capnography ; etcO₂, ECG, NIBP
 - Pulse oximetry
 - Methods of humidification.
 - Classification of breathing system -Mapleson system - a b c d e f
 - The circle system – Components & Soda lime, indicators
 - Ambu bag & its working
- **Anaesthesia Machine/Work station**
 - Hanger and yoke system
 - Cylinder pressure gauge
 - Pressure regulator
 - Flow meter assembly
 - Vapourizers - types, hazards, maintenance, filling and draining, etc.
- **Face Masks & Airway Laryngoscopes-** Types, sizes
- **Endotracheal tubes** - Types, sizes.
 - Cuff system
 - Fixing, removing and inflating cuff, checking tube position complications.
 - Problems during intubation
 - Difficult airway algorithm
 - Difficult airway cart
- **Oxygen therapy and related equipments**
- **Drugs**
 - Induction Agent: Thiopentone , Diazepam, Midazolam, Ketamine, Propofol,Etomidate.
 - Muscle Relaxants: Depolarising - Suxamethonium, Non depolarising - Pancuronium, Vecuronium, Atracurium, rocuranium
 - Inhalational Gases: Gases - O₂, N₂O, Air
 - Agents - Ether-, Halothane, Isoflurane, Saevoflurane, Desflurane
 - Reversal Agents: Neostigmine, Glycopyrrolate, Atropine, Nalorphine, Naloxone, Flumazenil (Diazepam)
 - Local Anaesthetics: Xylocaine, Preparation, Local – Bupivacaine - Topical,Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine

-Emergency Drugs

- Adrenaline : Mode or administration, dilution, dosage, Effects,
 - Noradrenaline
 - Atropine, bicarbonate, calcium, ephedrine, xylocard,
 - Ionotropes : dopamine, dobutamine, amidaron
 - Aminophylline, hydrocortisone, antihistaminics,
 - Potassium.
 - Cardiovascular drugs
 - Antihypertensives
 - Antiarrhythmics
 - Beta - Blockers
 - Ca - Channel blockers.
 - Vasodilators - nitroglycerin & sodium nitroprusside
 - Respiratory system - Bronchodilators, respiratory stimulants
- **Basic Anesthesia Techniques:**
 - PAC
 - General anaesthesia
 - Regional anaesthesia
 - Local anaesthesia
 - **Multiparameter Vital Sign Monitors**
 - Types of Multiparameter Vital Sign Monitor and ECG Machines and their applications.
 - Repair and maintenance of the Multiparameter Vital Sign Monitor
 - Types of patient electrodes and their application.
 - Recording of ECG and safety in use of equipment.
 - CPR

B.Sc. OTT 1st Year

Paper IV: Basic General Surgical procedures & Surgical/ Para Surgical equipments Theory Syllabus

- **Care & maintenance of OT equipment**

- Handling, cleaning and carbolisation of operation tables, operation theatres lights, suction machines, diathermy and other OT Equipment.
- Maintenance of special surgical equipment their care and preservation.
- Ventilation of operation theater air conditioning and control of pollution.

- **Recovery Room and Nursing Care**

- Pre-operative preparation of patient.
- Transportation techniques of patient in conscious, semiconscious and unconscious state, to and from Operation Theatre.
- Management of Pre-operative and post-operative rooms.
- Resuscitation Techniques along with the management of equipment and drugs.

- **Patient Handling and shifting techniques**

- **Operating Room Ethics, Discipline, Layout, Equipment**

- Moral aspects and duties of Medical Technologies.
- Indenting, Book Keeping and Storage procedures of different articles.
- Co-ordination with all working personal in operation theatre.
- Psychological aspects of patient staff and relatives of the patient.
- Management of operations theatre in routine and emergency.
- Theatre etiquettes.

- **Surgical techniques**

- Handling of Sterilization articles in the Operation Theatre.
- Techniques of Sterilization of surgical instruments and special equipment used in the operation theatre.
- Management of surgical equipment and techniques.
- Scrubbing techniques.
- Injection techniques: Intra muscular and intra venous and insertion of I.V. Cannulas, Handling or Syringes and needles.
- Types of suturing material, techniques of stitching and removed of stitches.

- Positioning of patient for different operations.

Marks distribution for practical exam:

Drugs: 10 marks

Anaesthesia Machine: 10 Marks

Equipments: 15 Marks

Total marks : 35

BASICS OF COMPUTER

Theory : 30 hours

Practical's : 30 hours

THEORY

Introduction to computer – I/O devices – memories – RAM and ROM – Different kinds of ROM – kilobytes, MB, GB their conversions – large computer – Medium, Micro, Mini computers - Different operating system – Networking – LAN, WAN, MAN (only basic ideas)

Typing text in MS word – Manipulating text – Formatting the text – using different font sizes, bold, italics – Bullets and numbering – Pictures, file insertion – Aligning the text and justify – choosing paper size – adjusting margins – Header and footer, inserting page No's in a document – Printing a file with options – Using spell check and grammar – Find and replace – Mail merge – inserting tables in a document.

Creating table in MS-Excel – Cell editing – Using formulas and functions – Manipulating data with excel – Using sort function to sort numbers and alphabets – Drawing graphs and charts using data in excel – Auto formatting – Inserting data from other worksheets.

Preparing new slides using MS-POWERPOINT – Inserting slides – slide transition and animation – Using templates – Different text and font sizes – slides with sounds – Inserting clip arts, pictures, tables and graphs – Presentation using wizards.

Introduction to Internet – Using search engine – Google search – Exploring the next using Internet Explorer and Navigator – Uploading and Download of files and images – E- mail ID creation – Sending messages – Attaching files in E- mail.

Role of Computers in the Health care: - HIS, Medical Equipment, Pharmacy in inventory management, Patient record maintenance.

PRACTICAL

- Typing a text and aligning the text with different formats using MS-Word
- Inserting a table with proper alignment and using MS-Word - Create mail merge document using MS-word to prepare greetings for 10 friends
- Preparing a slide show with transition, animation and sound effect using MSPowerpoint
- Customizing the slide show and inserting pictures and tables in the slides using

MSPowerpoint

- Creating a worksheet using MS-Excel with data and sue of functions Using MSExcel prepare

a worksheet with text, date time and data Preparing a chart and pie diagrams using MS-Excel
- Using Internet for searching, uploading files, downloading files creating e-mail ID

**B.Sc. Operation Theatre Technology 2nd year Paper I: Microbiology
and Pharmacology related to Anaesthesia Theory Syllabus**

Paper I: Microbiology and Pharmacology Theory Syllabus

MICROBIOLOGY (30 hours theory + 20 hours practical)

- Introduction to Microbiology & Aseptic techniques
- Medically important Gram Positive & Gram Negative Cocci
- Medically important Gram Negative Bacilli(GNB)
- Classification of fungus,
- Biomedical waste management
- Hospital acquired infections
- Blood stream infection
- Wound Infection & Urinary Tract Infections
- Respiratory tract Infction
- Catheter, IV associated Infections
- Hospital acquired infections & prevention of hospital acquired infections
- Hepatitis C

- Safety Measures in Microbiology lab
- Aseptic techniques
- Culture media (Liquid)
- Culture media (Solid)
- Antimicrobial sensitivity testing (AST)
- Sterilization in details
- Principles Of Sterilization & Disinfections
 - Types of Sterilization (Dry & Wet), methods, hazards and tasting
 - Sterilization of dry hot air.
 - Sterilization by gases e.g. ethylene oxide etc.

- Sterilization by radiation.
- Sterilization by chemical lotions, different chemicals and their applied chemistry.
- Sterilization by gamma-rays, ethylene oxide, ultra violet rays and etc
- Sterilization for soft rubber articles.
- Sterilization for carbonized articles.
- Sterilization for Ventilators
- Hazards of sterilization and their prevention
- Hazards of radiation, gases and chemical lotions and their prevention
- Methods to Checking sterility
- Types of disinfections;
 - Disinfection by boiling method.
 - Disinfection by chemical method.

PHARMACOLOGY: (50 hours theory + 20 hours practical)

- Routes of administration and dosage forms
- Pharmacokinetics
- Pharmacodynamics
- ANS
- Autacoids (histamine, serotonin, PGs)
- NSAIDs
- Drugs for cough and bronchial asthma
- Skeletal muscle relaxants
- Thyroid and anti thyroid drugs
- CHF
- Hematinics and drugs affecting coagulation, bleeding, thrombosis
- Anti arrhythmics
- Anti hypertensives
- Drugs acting on skin and mucous membrane
- Diuretics and antidiuretics
- Anti anginals
- General chemotherapy:
 - Beta lactams
 - Sulfonamides
 - Quinolones
 - Aminoglycosides
 - Macrolides

- Miscellaneous antimicrobials
- Drugs acting on uterus
- Atropine, Glycopyrrolate
- Diazepam, Midazolam, Phenergan, Lorazepam,
- Morphine, Pethidine, Fentanyl, Pentazocine
- Metoclopramide, Ondansetron, Dexamethasone
- Na citrate, Gelusil, Mucaine gel.
- Cimetidine, Ranitidine, Famotidine
- Bronchiolytic agents
 - Renal system - Diuretics, furosemide, mannitol
 - Obstetrics - oxytocin, methergin
 - Miscellaneous - Antibiotics, paracetamol, diclofenac- IV fluids, various preparations
NaCl, Ringer lactate, haemaccel, hetastarch, heparin, protamine, insulin, analgesics,
NSAID, ibuprofen, ketorolac,
- Laryngeal Sprays: Principal uses, mechanism and its maintenance.

Paper II: Advanced Operation theatre equipment and techniques Monitoring Equipment

- **Multiparameter Vital Sign Monitors**
 - Types of Multiparameter Vital Sign Monitor and ECG Machines and their applications.
 - Repair and maintenance of the Multiparameter Vital Sign Monitor
 - Types of patient electrodes and their application.
 - Recording of ECG and safety in use of equipment.
- **Defibrillators:**
 - Principle and mechanism of the defibrillator and its types.
 - Uses and safety precaution during use.
 - Maintenance and its operational capabilities.
- **Operation tables**
 - Features, material used in fabrication and advantages of the material.
 - Care, maintenance and uses.
 - Controls-Hydraulic system, Electrical System.
- **Diathermy/Cautery Machines:**
 - Different types of diathermy and cautery machines, monopolar,
 - Bipolar and underwater working.
 - Structural features of diathermy and cautery machines.
 - Types of active and passive electrodes.
 - Care, maintenance and uses.
 - Prevention of hazards.
- **Operation Lights:**
 - Types of Operation Lights and other Light sources.
 - Structural features, care cleaning carbolisation, maintenance and uses.
- **Endoscopy Equipment**
 - Types of endoscopes, Rigid & fiber - optic scopes i.e. Bronchoscope, Oesophago – gastro - l scope, laproscopes, Cystroscopes and endoscope etc.
 - Their structural features, uses care maintenance.
- **Operating Microscope:**
 - Types and features.
 - Principle structural features operating microscope
 - Microscopic photography and cameras used
 - Care, maintenance and uses
 - Glasses used and property

Paper III: Advanced Anaesthesia drug and Techniques

Theory Syllabus

- Advance anaesthesia machine & apparatus
- Anaesthesia Drugs
 - Induction agents
 - Muscle relaxants
 - Inhalational agents- gases/agents
 - Reversal agents
 - Analgesics- opioids/nonopioids
 - Sedatives/anxiolytics
 - Antiemetics/ antacids/H₂
- Regional anaesthesia /Local Anaesthetics

PRE-OP PREPARATION:

- Pre anaesthetic assessment~ History, past history - disease / Surgery / and personal history - Smoking / alcohol General physical assessment, systemic examination – CVS, RS, CNS

INVESTIGATIONS

- Routine Investigations & their relevance]
- Haematological - their significance
- Urine
- E.C.G.
- Chest X - ray
- Special: Endocrine, hormonal assays
- Echocardiography
- Angiography
- Liver function test
- Renal function test
- Others
- Case acceptance: ASA grading - I, II, III, IV. V

PRE - ANAESTHETIC ORDERS:

- Informed consent
- NPO status

- Premedication - advantages, drugs used
- Special instructions - if any

INTROPERATIVE MANAGEMENT

- Machine
- Checking the machine
- O2, N2O, suction apparatus
- Laryngoscopes, Endotracheal tubes, airways
- IV access & IV fluids
- Other monitoring systems

DRUGS

- Emergency drugs
- Anaesthetic drugs

INTRAOPERATIVE MANAGEMENT

- Confirm the identification of the patient
- Monitoring - minimum
- Noninvasive & Invasive monitoring
- Induction - drugs used
- Endotracheal intubation
- Maintenance of anaesthesia
- Positioning of the patient
- Blood / fluid & electrolyte balance
- Reversal from anaesthesia - drugs used
- Transferring the patient
- Recovery room – set up and things needed

POST OPERATIVE COMPLICATIONS Identification & Management

ANAESTHETIC CONSIDERATIONS for various types of surgical procedure

Obstetric, Orthopedic, ENT, EYE, General surgery, Neurosurgery, Plastic surgery, Urology,
Paediatric Surgery

- **CPR- BLS & ACLS**

Paper IV: Advanced surgical procedures and surgical/parasurgical equipment

- History of Surgery, role of the surgeon, importance of team work and anticipating the needs of surgeons; stresses that may arise during operative procedure
-
- Surgical terminology, types of incision and indications for the use of particular incision;
-
- Haemorrhage-signs and symptoms of internal and external; classification and management;
-
- Identification of types of tourniquets reasons for use and duration of application, dangers of use;
-
- Wounds, types, process of healing, treatment and complications; inflammation; wound infections-causes and treatment; incision and drainage of abscesses; importance of personal cleanliness and aseptic techniques;
-
- Pre-operative and post-operative care of the surgical patient; Emergency procedures;
-
- Knowledge of surgical asepsis, skin preparation for invasive procedures

Marks distribution for practical exam:

Drugs: 10 marks

Anaesthesia Machine: 10 Marks

Equipments: 15 Marks

Total marks : 35

B.Sc. Operation Theatre Technology 3rd year

Paper I: Operation Theatre Technology- Applied

1. General surgical procedure and para-surgical equipment
 - a. Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system.
 - b. Different types of diathermy machine. Monopole, Bipolar, Ligasure, Harmonic Scalpel, CUSA- Principle, hazards, prevention, functioning and maintenance.
 - c. Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance.
 - d. Operation Theatre sterilization- Different recent advances.
 - e. LAR/APR--Positioning of patient, care-Prevention of hazards.
 - f. Total thyroidectomy—with emphasis on proper positioning.
 - g. Transthoracic esophagectomy—Different approaches.
 - h. Venesection and Tracheostomy.
 - i. Laproscopic Cholecystectomy – Pneumoperitonium - Creation and removing, principles.
 - j. Nephrectomy.
 - k. Breast surgery.
 - l. Positioning of patient for different operations: Problems and hazards.
 - m. Hypothermia and hyperthermia.

2. Haemorrhage and Blood Transfusion
 - a. History of discovery of blood groups and genetics of blood groups.
 - b. Types of blood groups and Rh factor.
 - c. Coombs test.
 - d. Collection of blood, its preservation and standardization.
 - e. Various types of blood and blood products(Packed cells, PRP, FFP)
 - f. Pre-transfusion checks.
 - g. Transfusion reactions.
 - h. Types of haemorrhage

Indications of specific fluids and their complications

Paper II: Operation Theatre Technology- Clinical

Surgeries related to

- Respiratory System
- Cardiovascular system
- Nervous system
- Renal system
- Hepatobiliary system
- Bio medical waste management

- Waste disposal collection of used items from user area, reception protective clothing and disinfections sage gaurds,
- CSSD Procedures related to equipments
 - use of disinfectionts sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc. contaminated high risk baby care - delicate instruments or hot care instruments,
 - cleaning process - use of detergents. Mechanical cleaning apparatus, cleaning instruments, cleaning jars, receivers bowls etc. trays, basins and similar hand ware utensils. Cleaning of catheters and tubings, cleaning glass ware, cleaning syringes and needles.
 - Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays ahd galliparts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.
 - General observations principles of sterlization. Moist heat sterlization. Dry heat sterlization. EO gas sterlization. H2O2 gas plasma vapo sterlization

Paper III: Critical Care Equipment and Procedures in ICU

MONITORING AND DIAGNOSTIC PROCEDURES IN I.C.U.

- Central Venous access.
- ECG monitoring.
- Invasive hemodynamic monitoring

GENERAL CARE OF PATIENT IN I.C.U.

- Eye
- Bladder Skin
- Care of mechanically ventilated patient
- Tracheostomy, humidification
- Vascular lines - arterial, venous line
- Radiography
- Physiotherapy - chest physiotherapy

FLUID BALANCE AND PARENTERAL NUTRITION

INFECTIOUS DISEASES IN I.C.U.

- Antibiotics in I.C.U.
- Oxygen therapy
- Mechanical ventilation

ACID - BASE DISORDERS

CARDIOVASCULAR FAILURE

- Inotropic support
- Vaso dilator drugs.

RENAL FAILURE & LIVER FAILURE

HEAD INJURY

PRINCIPLES OF TRANSFUSION THERAPY

- Whole blood, erythrocyte products
- Plasma components

Platelets concentrate) Massive transfusion, acute transfusion reactions.

VENTILATORS

- Principles of working of different ventilators
- Volume cycles ventilators.
- Time cycle's ventilators

- Pressure cycles ventilators
- High Frequency ventilators etc.

ABG MACHINES

- Working
- Principles & Useses

REGIONAL ANAESTHETIC TECHNIQUES.

- Local anaesthetic technique
- Nerve blocks
- Spinal Anaesthesia
- Epidural anaesthesia

Ultra sound guided nerve blocks

Marks distribution for practical exam:

Drugs: 10 marks

Anaesthesia Machine: 10 Marks

Equipments: 15 Marks

Total marks : 35

Paper IV: Specialized Surgical Procedures

1. Cardiovascular and Respiratory System- Techniques, equipment, procedures and instruments
 - a. Diseases of cardiovascular and respiratory systems.
 - b. Types of perfusion machines.
 - c. Techniques of Perfusion and operational capabilities.
 - d. Intra-aortic Balloon pump.
 - e. Cell saver techniques.
 - f. Care, maintenance and working of Heart lung Machine.
 - g. Positioning during cardiothoracic surgical procedures.
 - h. Positioning and techniques for:
 - Radial artery cannulation.
 - Central venous cannulation/pulmonary artery catheter.
 - Femoral artery/venous cannulation
2. Neurosurgical
 - a. During various neurosurgical procedures including sitting, prone, lateral and position for trans-sphenoidal hypo-physectomy.
 - b. Fixation of head during various neurosurgical procedures.
 - c. Prone and Knee chest position for spine surgery.
 - d. Surgical requirements during aneurysm surgery
 - e. Surgical requirements during micro neurosurgery including types of microscopes, principle, structural features, microscopic photography and cameras used.
3. Surgical requirements during thyroid surgery, adrenal surgery.
4. Surgical requirements during abdominal surgery including Laproscopic surgery, genitourinary surgery including percutaneous nephrolithotomy, Endoscopic surgery, TURP, TURBT, Lithotripsy, ESWL (Extracorporeal shock wave therapy)
5. Surgical requirement during renal transplant donor and recipient surgery including care and precautions during operative procedures of hepatitis B & hepatitis C positive patients.
6. Surgical requirement during pediatric and Neonatal surgical procedures including emergency procedures like tracheo-esophageal fistula. Sub diaphragmatic hernia, major abdominal and thoracic procedures. Foreign body bronchus and esophagus.
7. Intraoperative and postoperative problems and complications of general surgery.
8. Management of emergency caesarean section.
9. Management of massive obstetrical hemorrhage.
10. Surgical management in major burns and craniofacial surgery.
11. Surgical management of joint replacement and arthroscopy.
12. Surgical management of endoscopies, laryngectomy with RND and cochlear implant.
13. Management of PPV and perforating eye injury

Marks distribution for practical exam:

Drugs: 10 marks

Anaesthesia Machine: 10 Marks
Equipments: 15 Marks
Total marks : 35