

B.S c. DEGREE IN OPERATION THEATRE & ANAESTHESIA
TECHNOLOGY
from the Academic Year 2014-15

I YEAR SYLLABUS

Paper -I : Applied Basic Science

BASIC ANATOMY

THEORY

Introduction to Anatomy

Basic Anatomical terminology

Osteology- Upper limb - clavicle, scapula, humerus, radius, ulna
Lower limb - femur, hipbone, sacrum, tibia, fibula
Vertebral column

Thorax - Intercostal space, pleura, bony thoracic cage, ribs sternum & thoracic vertebrae

Airway - **Larynx**, Trachea, bronchial tree

Heart - Surface anatomy of heart, chambers of the heart, valves of the heart, major blood vessels of heart, pericardium, coronary arteries.

Skeleto-muscular system - Muscles of thorax, muscles of upper limb & Lower limb (Names and basic Anatomy only)

Excretory system - Kidneys, ureters, bladder, urethra

PRACTICALS

Mannequins to be provided for Teaching

Osteology - Bones identification (right and left side) and prominent features of clavicle, scapula, radius, ulna, humerus, femur, hip bone, sacrum, tibia, fibula.

Surface Anatomy,

Radiology, X-ray Chest PA view, X-ray of limbs and X-ray abdomen:- -Names Views and identification

PHYSIOLOGY

THEORY

1) The Cell:

- (I) Cell Structure and functions of the various organelles.
- (ii) Endocytosis and exocytosis
- (iii) Neuro muscular junction

2) The Blood:

- (i) Composition of Blood, functions of the blood and plasma proteins:-
- (ii) Function of Hemoglobin
- (iii) Erythrocyte Sedimentation Rate.
- (iv) Detailed description about WBC–Total count (TC), Differential count (DC) and functions.
- (v) Platelets - formation and normal level and functions
- (vi) Blood groups and Rh factor

3) Cardio–Vascular System:

- (i) Physiology of the heart
- (ii) Heart sounds
- (iii) Cardiac cycle, Cardiac output.
- (iv) Auscultatory areas.
- (v) Arterial pressures, blood pressure
- (vi) Hypertension
- (vii) Electro cardiogram (ECG)

4. Respiratory system:

- (i) Respiratory movements.
- (ii) Definitions and Normal values of Lung volumes and Lung capacities.

5. Excretory system:

- (i) Normal Urinary output
- (ii) Micturation
- (iii) Renal function tests

6. Reproductive system:

- (i) Reproductive organs
- (ii) Brief account of menstrual cycle.

7. Central Nervous system:

- (i) Functions of CSF
- (ii) Functions of Cortex
- (iii) Sleep cycle
- (iv) Reticular activating system

8. Endocrine system:

Functions of the pituitary, thyroid, parathyroid, adrenal and pancreatic Hormones.

9. Digestive system

- (i) Physiological Anatomy of the GIT.
- (ii) Food Digestion in the mouth, stomach, intestine
- (iii) Absorption of foods and gastric emptying
- (iv) Role of bile in the digestion.
- (v) Vomiting mechanism

PRACTICAL

- 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 Expiration

BIO-CHEMISTRY

Cellular

Metabolism

- (I) Enzymes
- (II) Co-enzymes
- (III) Glucose Metabolism
- (IV) Urea Cycles
- (V) Protein & lipid Classifications and

functions. Vitamins & Minerals:

Fat soluble vitamins(A,D,E,K) - Water soluble vitamins - B-complex vitamins- principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur)- Trace elements - Basal metabolic rate(BMR) - respiratory quotient(RQ) Specific dynamic action(SDA) - Balanced diet - Nutritional deficiency like Marasmus - and Kwashiorkor

Acids and bases:

Definition, pH, Henderson - Hasselbalch equation, Buffers, Indicators, Normality, Molarity, Molality

BIOCHEMISTRY SYLLABUS FOR PRACTICALS

1. Benedict's test
2. Heat coagulation tests

PATHOLOGY

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
Acute inflammation
Chemical mediators of inflammation
Chronic inflammation
3. Immunity disorders.
General features of the immune system
Disorders of the immune system
Hyper sensitivity reaction - I, II, III, IV
4. Infectious diseases.
General principles of microbial pathogenesis
Viral infections - HBV, HCV, HIV, CMV
Bacterial infections- Staphylococci, /streptococci, E-Coli, Salmonella, Tuberculosis.
Fungal infections
Parasitic infections
TORCH infection
5. Neoplasia.
Definitions
Nomenclature
Biology of tumor growth benign and malignant neoplasms
Carcinogenic agents and their cellular interactions Clinical features of tumors
6. Environmental and nutritional disorders.
Occupational Hazards
Radiation injury
Marasmus
Kwarsiorkar

ENGLISH

Role of communication
Defining Communication
Classification of communication
Purpose of communication
Major difficulties in communication
Barriers to communication
Characteristics of successful communication - The seven Cs
Communication at the work place
Human needs and communication “Mind mapping”
Information communication

Comprehension passage:

Reading purposefully
Understanding what is read
Drawing conclusion
Finding and analysis

Explaining:-

How to explain clearly
Defining and giving reasons
Explaining differences

Explaining procedures
Giving directions

Writing business letters:-

How to construct correctly
Formal language
Address
Salutation
Body
Conclusion

Report writing:

Reporting an accident
Reporting what happened at a session
Reporting what happened at a meeting

BASICS OF COMPUTER

COURSE CONTENT:

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 computer languages - Number system - Binary and decimal conversions - Different operating system - MS DOS - Basic commands - MD, CD, DIR,TYPE and COPY CON commands - 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 - Introduction to "C" language - Different variables, declaration, usage - writing small programs using functions and sub - functions.

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 MS-Powerpoint

Customizing the slide show and inserting pictures and tables in the slides using MS-powerpoint

Creating a worksheet using MS-Excel with data and use of functions

Using MS-Excel 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

Using C language writing programs using functions

B.Sc. Operation Theatre & Anaesthesia Technology Course

Ilyear syllabus

Paper-1: Applied Pharmacology and Microbiology

Applied Pharmacology

ANTISIALAGOGUES

Atropine, Glycopyrrolate

SEDATIVES I ANXIOLYTICS

Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, Trichlopho

NARCOTICS

Morphine, Pethidine, Fentanyl, Pentazozine

ANTIEMETICS

Metaoclopramide, Ondansetron, Dexamethasone

ANTACIDS

Na citrate, Gelusil, Mucaine gel.

H2 BLOCKERS

Cimetidine, Ranitidine, Famotidine

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, Sevoflurane, 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, Isoprenaline
- Atropine, bicarbonate, calcium, ephedrine, xylocard,
- Ionotropes : dopamine, dobutamine, amidaron
- Aminophylline, hydrocortisone, antihistamines, potassium.
- Cardiovascular drugs
- Antihypertensives
- Antiarrhythmics
- Beta – Blockers
- Ca – Channel blockers.
- Vasodilators – nitroglycerin & sodium nitroprusside
 - Respiratory system – Bronchodilators, respiratory stimulants Broncholytic agents
- Renal system – Diuretics, furosemide, mannitol
- Obstetrics – oxytocin, methergin
- Miscellaneous – Antibiotics NSAIDs Anticoagulants and Insulin

Applied Microbiology

- Sterilization & decontamination- I
 - o Dry Heat
 - o Moist Heat
- Sterilization – II
 - o Chemical methods
 - o Gaseous methods
 - o Filtration
- Wound Infection & Urinary Tract Infections
- Blood stream Infections
- Respiratory tract Infection
- S.Typhi, Salmonella Paratyphi 'A', Salmonella Typhimurium
- Catheter, IV associated Infections
- Hospital acquired infections & prevention of hospital acquired infections
- Hepatitis C, HBV, HIV
- * Hyper sensitivity reaction - Type I, II, III, IV

Paper-2: Medicine and Medical Ethics

MEDICINE

1. Disorder of haemopoiesis – Anaemias – iron deficiency anaemia,
 2. Infections diseases – Sepsis and septic shock, fever of unknown origin, infective endocarditis, infective of skin, muscle, soft tissue, infection control in hospital, diseases caused by bacteria, viruses, mycobacteria, viruses, fungi and protozoa and helminthes, common secondary infection in HIV.
3. Diseases of CVS – congenital RHD – Rheumatic fever, CAD, Peripheral vascular diseases.
4. Respiratory system – asthma pneumonia
5. Kidney & Urinary tract – acute renal failure, Glomerulonephritis, Haemodialysis, Transplant, Urinary tract infection
6. Liver and biliary tract disease – Viral hepatitis, alcoholism
7. Endocrinology and metabolism – Diabetes mellitus, Hyper – and hypothyroidism

MEDICAL ETHICS

1. Medical ethics – Definition – Goal – Scope
2. Code of conduct – Introduction -

3. Basic principles of medical ethics - Confidentiality
4. Malpractice and negligence – Rational and irrational drug therapy
5. Autonomy and informed consent – Right of patients
6. Care of the terminally ill- Euthanasia
8. Organ transplantation
9. Medico legal aspects of medical records - Medicolegal case and type- Records and document related to MLC – ownership of medical records – Confidentiality Privilege communication – Release of medical information – Unauthorized disclosure – retention of medical records – other various aspects

Paper-IV: **PRINCIPLES OF ANAESTHESIA – I**

1. MEDICAL GAS SUPPLY

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

2. ANAESTHESIA MACHINE

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator
- Flow meter assembly
- Vapourizers – types, hazards, maintenance, filling and draining, etc.

3. BREATHING SYSTEM

- General considerations: humidity & heat
- Common components – connectors, adaptors, reservoir bags.

- Capnography ETC o2
- Pulse oximetry
- Methods of humidification.
 - Classification of breathing system Mapleson system – a b c d e f Jackson Rees system, Bain circuit
- Non rebreathing valves – ambu valves
- The circle system Components Soda lime, indicators

4. FACE MASKS & AIRWAY LARYNGOSCOPES

- Types, sizes
- Endotracheal tubes – Types, sizes.
- Cuff system
- Fixing, removing and inflating cuff, checking tube position complications.
- * Bousie
- * LMA

5. ANAESTHESIA VENTILATOR AND WORKING PRINCIPLES.

6. MONITORING

- ECG
- SpO2
- Temperature
- IBP
- CVP
- PA Pressure
- LA Pressure

Bio Medical engineering of Trouble sorting Management, care of cleaning

7. BASIC ANAESTHETIC

TECHNIQUES

INTRODUCTION TO

ANAESTHESIA

- General Anaesthesia
- * Regional Anaesthesia
- * Local Anaesthesia
- * Intravenous Anaesthesia
- Minimum standard of anaesthesia
- Who should give anaesthesia?

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 - 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:

- Patient - Informed consent
- Npo guidelines
 - Premedication - advantages, drugs used
 - Special instructions - if any

- Machine - Checking the machine
- 02, N20, suction apparatus
 - Laryngoscopes, et tubes, airways
 - Things for IV accessibility
 - 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 & MANAGEMENT

- **Recovery and Delayed recovery**

- Hypoxia and Oxygen Therapy
- PONV

B.Sc. Anaesthesia Technology Course

III year syllabus

Main Syllabus

1. Sterilization Procedures
2. Regional anaesthetic techniques
3. Anaesthesia for speciality Surgeries.

Paper -1 : Sterilization Procedures

1. Waste disposal collection of used items from user area, reception protective clothing and disinfections sage guards, Bio-Medical wastes, Color cooling and management
2. use of disinfections sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc. contaminated high risk baby care – delicate instruments or hot care instruments,
3. 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.
4. Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays and 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.
5. General observations principles of sterilization. Moist heat V. Nervous System. Dry heat Ssterilization. EO gas sterilization. H2O2 gas plasma capo sterilization.

Paper-II : Principles of Anesthesia-II

3. Regional Anaesthetic techniques.

- a. Local anaesthetic technique
- b. Nerve blocks
- c. Spinal
Anaesthesia
- d. Epidural
anaesthesia

4. Anaesthesia for speciality

Surgeries NEURO

ANAESTHESIA

- Glasgow coma scale
- Premedication
- Special investigation – CT, Angiography and MRI
- Checklist
- Induction of a patient
- Reinforced Endotracheal tubes
- Positioning in neuro surgery
- I.C.P.
- Air embolism
- Reversal of the patient
- Transferring to I.C.U. / Ward

OBSTETRIC ANAESTHESIA

- Differences between a pregnant and a normal lady
- Risks for anaesthesia.
- Precautions to be taken
- Check list
- Regional vs general anaesthesia
- Induction / maintenance and recovery .
- Resuscitation of the new born, APGAR score
- Reversal and extubation
- Emergencies – manual removal of placenta
 - A.P .H.
 - P.P.H.
 - Ruptures uterus
 - Ectopic Pregnancy

PAEDIATRIC

ANAESTHESIA

- Theatre setting
- Check list
- * Fluid Calculation and administration
- Premedication – modes
- Induction
- Intubation – Securing the EIT
- Reversal & extubation - Problems
- Transferring / ICU management
- Pain management

ENT Anaesthesia

- Anaesthesia for adenotonsillectomy
- Anaesthesia for mastoidectomy
 - Bronchoscopy and oesophagoscopy

CARDIAC

ANAESTHESIA :

- NYHA classification
- Arrhythmias
- Angina
- Dyspnoea
- Special investigations
 - o echo cardiography
 - o angiography
- Premedication
- Setting up of monitoring system
- Monitoring – invasive and non – invasive
- Getting ready for the case
- Induction of cardiac patient, precautions to be taken
- Cardiopulmonary bypass
- Weaning of CPB
- Transferring the patient to ICU.
- Care to be taken
- I.C.U management.
 - Chest tube management

ANAESTHESIA OUTSIDE

THE O.R.

- Situations
- Cath Lab
- Radiology
- E.C.T.
- Short comings.

DAY CARE ANAESTHESIA

- Special features
- Set up

- Advantages
- Disadvantages
- Complications
- Future

GERIATRIC ANAESTHESIA

- Physiological changes
- Diseases of aging
- Nervous system
- Geriatric pharmacodynamics / pharmacokinetics
- Postoperative nervous system dysfunction.

ANAESTHESIA FOR TRAUMA & SHOCK

- Resuscitation
- Pre-op investigation & assessment
- Circulatory management
- Management of anaesthesia
- Rapid sequence induction
- Other problems

THORACIC ANAESTHESIA

- Pulmonary function
 - tests o bed side
 - o Vitallograph
- Preoperative preparation
- Premedication
- Check list
- Induction. Intubation
- Double lumen tubes
- monitoring
- Pain management
- Extubation
- ICU management

Postoperative problems

Nausea & Vomiting

Sore throat

Laryngeal edema, Bronchospasm

Neurological complications.

Awareness

Vascular complications.

Trauma to teeth

Headache

Backache

Ocular complications

Auditory complications

MAJOR CATASTROPHES

- o Mortality
- o Causes of death
- o Cerebral damage
- o Prevention.

B.Sc. ALLIED HEALTH SCIENCES EXAMINATION PATTERN - I YEAR

B.Sc. in Operation Theatre and Anaesthesia Technology

Subjects	Theory		Practical Internal Assessment			
	Max	Min	Max	Min	Max	Min
1. Applied Basic Sciences	100	50	50	25	50	25
2. Computer and English **	100	50	50	25	50	25

**** Computer and English will be the internal paper, institution will send the marks to the university**

B.Sc. ALLIED HEALTH SCIENCES EXAMINATION PATTERN - II YEAR

B.Sc. Degree in Operation Theatre and Anaesthesia Technology

Subjects	Theory		Practical		Internal Assessment (IA)	
	Max	Min	Max	Min	Max	Min
1. Applied Pharmacology & Microbiology	100	50	50	25	50	25
2. Medicine and Medical Ethics	100	50	50	25	50	25
3. Principles of Anesthesia - I	100	50	50	25	50	25

B.Sc. ALLIED HEALTH SCIENCES EXAMINATION PATTERN - III YEAR

B.Sc. Degree in Operation Theatre and Anesthesia Technology

Subjects	Theory		Practical		Internal Assessment (IA)	
	Max	Min	Max	Min	Max	Min
1. Sterilization Procedures	100	50	50	25	50	25
2. Principles of Anesthesia – II	100	50	50	25	50	25
