O.T. Technician

Syllabus

Teaching Programme

BASIC SCIENCES

DOT – 101 ----- 40 HOURS

1. Applied Physics + Chemistry + Basic Computer **30 hours**

Applied Physics:- Energy, Potential Energy, Kinetic Energy, Mechanical efficiency

i. **Basic principles of mechanics like Concept of Force, pressure, mass weight, and properties of solid, liquids & gases.**
ii. **Basic principles of Electricity as applied in the field of Operation Theatre, ICU, CSSD.**
iii. **Concept of static electricity, concept of charge, potential current, power, resistance.**
iv. **Basic principles of heat, concept of temperature, its measurement, ways of dispersion of heat.**
v. **Effect of heat, rise or fall in temperature, it effect on human bodies, methods of prevention of heat loss, rise or fall in temperature, it effect on human bodies, methods of prevention of heat loss, Thermometry, thermistor, thermo-couple.**
vi. **Concept of Volume, specific gravity, density, concentration of solutes.**
vii. **Gas law & their practical implication in the field.**
viii. **Compressed gases & filling ratio, Principles of pressure regulators, flow of gases, fluids viscosity, law of laminar, flow rate, Turbulant floor, critical Reynolds's member, Resistance to Laminar & Turbulant flow.**
ix. **Pressure loss due to abrupt change in bore of tube. Principle of flow meters and its types.**

Applied Chemistry:- **10 hours**

Organic chemistry: Nomenclature of compounds containing, Halogens, Alcohols, and Phenols, Ethane, Propane, either, aldehydes and ketones, carboxylic acid, cyanides, Isocyanides, Nitrogen compounds and amines. Haemogenous and Heterogeneous aminoacids, peptides proteins and enzymes, carbohydrates and their metabolism.

Computer Science:-

Introduction to programming

- **Representation or information- Basic logic, design and memory, devices and data communication.**

- **Computer oriented numerical and statistical methods—arithmetic, interactive method, solution of simultaneous linear equation, interpolation, approximation, numerical differentiations and integration, statistics methods, for casting tech., relevant in BD, information extraction,**

DOT—102 **20 hours**

a. Anatomy – Gross Anatomy of the following :

1. **Human body & Anatomical terms & cell structure.**
2. **Musculo – skeleton systems, skull, vertebral column, pelvic bones, extremities, rib cage.**
3. **Respiratory systems – Nose, larynx, trachea, lungs and thoracic cabity.**
4. **Carbio-vascular system – Heart, major arteries & veins, renal & portal system.**
5. **Alimentary system – mouth, pharynx, oesophagus, stomach, small intestine & large intestine, spleen, liver, gall bladder, pancreas.**
6. **Brain, spinal chord, menigeal coverings.**
7. **Sensory organs – Skin, eyes, ears, tongue, nose.**
8. **Urinary system – kidney, ureter, urinary bladder-urethra**
9. **Reproductive system – male & female.**

b. Physiology – Gross physiology of the following system: **20 hours**

1. **G.I.T. system**
2. **Urinary system – kidney, formation of urine and role in electrolyte balance.**
3. **Muscular system – structure & function of cardiac muscles, skeletal muscle, involuntary muscles.**
4. **Cardio Vascular system – cardiac output, circulatory system, BP.**
5. **Respiratory system – Pulmonary system, exchange of gases, airway resistance.**
6. **Central nervous system – conduction of nerve impulse, peripheral and automatic nervous system.**
7. **Endorcrene glands – broad idea about metabolic processes, fluid and electrolyte balance, Pitutary, thyroid, parathyroid and adrenal gland.**
8. **Maternal and neonatal physiology.**
9. **Organs of special senses – skin, ear, eye, tongue & nose.**
10. **Pressure loss due to abrupt change in bore of tube, Principle of flow meters and its types Bernoulli Principle & its application.**

DOT—103

A. PATHOLOGY -- 20 hours

1. **Hb—synthesis & degradation. Abnormal haemoglobin, Oxygen carrying.**
2. **IV fluids.**
3. **Bloodgroups & blood transfusions, B.T., C.T.**
4. **Co-agulation & bleeding disorders, blood transfusion reactions**
5. **Sample collection, labeling & sending it to lab.**
6. **W.B.C., TLC and DLC, ESR and PCV**

B. MICROBIOLOGY -- 20 hours

1. **Introduction**
2. **Different types of infections, pathological bacteria, viruses, actino- mycosis & fungi Nosocomical infections.**
3. **Universal precautions for AIDS, HBV etc.**
4. **Infection in Operation Theatre. HAI**
5. **Waste disposal.**
6. **Sample collection, labeling and sending it to lab.**
7. **Types of disinfections & sterilization**
8. **Antigen and antibody reaction.**

2. <u>Anesthesia Techniques</u>

- **Aims and objectives**
- **Types of Anesthesia & Analgesics (routes im, iv, skin patches, suppositories etc.**
- **General anesthesia**
- **Local blocks**
- **Regional, spinal, epidural and nerve blocks**

3. <u>Drugs used in Anesthesia</u>

- **Inducing agents**
- **Muscles relaxants & reversal**
- **Inhalational anesthesia**
- **Sedatives, hypnotics, analgesics**
- **Anticholonergic**
- **Antihypertensive**
- **Antiemetic**
- **Drugs used in obstetrics**
- **Anticholonergic**
- **Antihypertensive**
- **Antiemetic**
- **Drugs used in Obstetrics**
- **Anticholnestrate drugs**
- **Antiallergic drugs**
- **Antiallergic drugs**
- **Steriods**
- **Drugs used in cardiac arrest, shock**
- **Miscellaneous drugs**

- **Drugs used in local blocks, spinal & epidural**

4. **<u>Gases</u>**

- **Oxygen, Nitrous Oxide, Carbon dioxide, Cyclopropane, Nitrogen**
- **Cylinders – handling and care. Types and size of cylinders**
- **Central gas pipe line.**

5. **<u>Boyle's apparatus</u>**

- **Face mask, vaporizers etc.**
- **Supply of compressed gases, Liquid oxygen storage and supply system, Methods or reducing these gases to workable pressure, structure or reducing value.**
- **Methods of vaporizing volatile anesthesia agents, Maintenance & safety precautions.**
- **Types of circuits – open, semiclosed & closed circuits.**
- **Non rebreathing valve, T-piece, To & FRO system**
- **Type of value used in different circuits.**
- **Resuscitators (ambo back, silicon bag etc.)**

6. **<u>Intubating Equipments</u>**

- **Larygoscopes, Endotracheal tubes, tube connections, Magill forceps, bite block equipment for difficult intubation, stylet, boggie, Mc Coy laryngoscope, LMA, fibre Optic bronchoscope, air ways, pharyngeal airways, combi tube, crico-thyrodecomy Selection, cleaning & sterilization.**

7. **<u>Monitoring Equipment</u>**

- **Stethoscope, B.P. apparatus, oesophageal stethoscope, Pulse Oximeter, Multimonitor, ECG and capnometer, gas monitor, temperature**

8. **<u>Instruments used in Anesthesia</u>**

- **Anesthesia Ventilator, infusion pump suction catheters, canulae, spinal & epidural needles.**

9. **<u>IV Fluids</u>**

- **Preparation of L.V. drip, types of fluid, precautions, allergic reaction, Blood transfusion.**

10. **Setting of Anesthesia trolley for different types of anesthesia**

- **Setting trolley for CRP Training in basic life support, advance life support.**

11.Suction machine, diathermy machine, Defibrillator, Baby resuscitation trolley, trolley for difficult intubation.

12. Anesthesia in different surgeries

- **G.I., Genitourinary, ENT, eye, neuro, plastic, obstetric & gynae, paed neonates. Cardio-pulmonary, ortho etc.**

13. Technical terms used in Anesthesia.

14. Anesthesia in special problematic surgical/diagnostic procedures.

15. Blood warming, preservation, checking.

16. Pain path ways, techniques and relief, various nerve blocks and agents.

17. Recent advances.

DOT – 202

SURGICAL TECHNIQUES **10 hours**

1. **Infection – General principles of asepsis. Specific infections like tetanus, gas gangrene, cellulites, carbuncle, abscess etc.**
2. **Dressing, sutures, bandages & plasters.**
3. **Give broad ideas about the following, with emphasis on surgical positions, instruments required in the case and role of Assistant:**

- **Swelling in necks**
- **G.I. surgery eg. Appendix, gall bladder, Int, Obst., hernia etc.**
- **Genito-urinary surgery eg. Prostate, Kidney stones**
- **Plastic surgery – burns, graft etc.**
- **Haemorrhoids, fistula, fissure etc.**

4. **Preparation of patient, Aseptic techniques & draping.**
5. **Universal precaution for HIV positives, HbAs Antigen.**

ORTHOPAEDIC

Give broad ideas with emphasis on Assistant's role such as making positions, plasters, preparation of instrument trays etc of the following:

- **Fractures such as closed reduction, open reduction applications of plasters**
- **Surgery on the Spine**
- **Implants eg. THR, TKR, shoulder**
- **Handling of C – Arm**
- **Application of tournequits**

GYNAE & OBSTETRIC

1. **Introduction of Gynae & Obst Instruments used in normal delivery, forceps etc**
2. **LSCS including instruments required, Emergency LSCS**
3. **Neonatal resuscitation**

- **Pain relief in Labour**
- **MTP & Cautterization of Cx, D&C, hystretomy**
  Abdominal, vaginal & lap assisted (LAVH)

- **Laparoscopic sterilization, Laparocator & Laparoscope**
- **Diagnostic aids in pregnancy and labour**
- **Ectopic pregnancy**

ENT & EYES

Give broad ideas about the surgery with emphasis on position, instruments required and Assistant's role in keeping & maintenance of microscopes etc.

1. **Tonsil & adenoids**
2. **Septoplasty, Mastoid & tympanoplasty**
3. **Instruments & positions**
4. **Tracheostomy, Laryngectomy, Tracheal repair.**

Eye Surgery :-

Broad idea about surgery but emphasis on role of technician as assistant in position, bandaging, preparation of instruments, cataract, squint, penetrating injury, syringing etc.

Special Equipment :-

Endoscope, bronchoscope, oesophago scope, fiberscope, laproscope, cystoscope, imaging equipment, X-ray & C-arm, ultrasound care maintenance and sterilization.

Nursing Care **5 hours**

- **Pre-operative management of patient**
- **Post-operative management of patient**
- **PACU: Post Anesthesia Care Unit**
- **Transportation of critically ill. Transportation ambulance.**
- **Shifting patients, monitoring of vital functions, detection of life threatening problems, eg, shock respiratory failure, vomiting etc.**
- **Transportation of patient to and from the operation theatre.**

DOT – 203

Emergency Management

- **First Aid**
- **Road side accident**
- **Shock, cardiac arrest, CPR**
- **Disaster Management**
- **Shifting of critical patients**

I C U (Intensive Care Unit) :

- **Setup, services rendered, rules, procedures, discipline, management of asepses.**
- **Types of patients, care & physiotherapy of unconscious patients.**
- **Equipments used in ICU, their functions, operation and maintenance.**
- **Suction catheters and tubes, CVP lines, Respiratory Ventilator, Methods of suctioning**
- **Humidifier, Cardiac monitor, ABG, Spirometer, Central gas pipeline, Intra arterial canulation.**
- **Duties of Assistant in ICU.**
- **Types of beds, Ventilation of patient in crises mouth to mouth, mouth to tube AMBU bag**
- **ICU lab**
- **Management of tetanus patients**
- **Psychological aspect of patient, relatives**
- **Haemofilteration**
- **ECG, EMG, EEG**

DOT 205

Emergency Management

- **First Aid**
- **Road side accident**
- **Shock, cardiac arrest, CPR**
- **Disaster Management**
- **Shifting of critical patients**

<u>Practical Anesthesia:-</u>

<u>Introduction to O.T. :</u>

- **Principles of sterilization of O.T. – fumigation, carbolization, zonal practices, Anesthesia machine**
- **Anesthesia drugs**
- **Intubating equipment**
- **I.V. infusion – preparation of drip, allergic reactions**
- **Suction machine**
- **Understanding sterile techniques, gowning & wearing of gloves**
- **Different types of anesthesia**
- **Taking pulse, B.P., monitoring equipment, making positions for surgeries and anesthesia**
- **Airway management**
- **Injections**
- **O_2 therapy**
- **Table and positions, bandaging plasters**
- **Pre op & post op management of patient**
- **Technique of operating autoclaves**
- **Instrument & linen preparation**
- **Record keeping**

O.T. Equipments

- **Maintenance of special surgical equipment**
- **Types of scopes eg. Bronchoscope, fibre optic scope, laryngoscope, cystoxcope.**
- **Microscope – Care & maintenance**
- **Techniques of handling of laser based equipment.**
- **Ventilation of O.T., Air conditioning & control of pollution**
- **Defibrillator—mechanisms, care & maintenance, uses, safety & Precautions**

REFERENCE BOOKS

Name of book	Author
1. Operation Room Techniques	Dr. Pramila Bhalla
2. Essentials of Anesthesia	Arun Kumar paul

3.	Clinical Anesthesia	Arun Kumar paul
4.	Primary Anesthesia	Churchil Livingstone
5.	Essentials of Anesthesia Equipment	B.C. Shaikh & Istacy
6.	Anatomy & Physiology	Rozen & Wilson
7.	General Nursing Course—OTT & Anesthesia	C.P. Threoyamme
8.	Operation Theatre Synopsis of medical Instruments & Procedures	Arora & Yadav
9.	Problem based learning of clinical Pharmacology	Krishan K Agarwal
10.	Pharmacology for Nursing	S. Bhattacharya
11.	Text book of Anesthesia	A.R. Aitkenhead G. Smith
12.	Understanding Anesthesia equipments	Susan E. Dorsch & Jeremy E. Dorseh