

SINGHANIA UNIVERSITY

RAJASTHAN

DETAILED SYLLABUS

DOTT

(DIPLOMA IN OPERATION THEATER TECHNOLOGY)

(YEARLY PROGRAMME)

DOTT (Diploma in Operation Theater Technology)

COURSE TITLE

: DOTT

DURATION

: 2 YEARS

FIRST YEAR

COURSE TITLE	PAPER CODE	MARKS		
		Theory	Practical	Total
GENERAL ANATOMY	DOTT- 101	100	100	200
PHYSIOLOGY	DOTT - 102	100	100	200
PATHO & MICRO	DOTT - 103	100	100	200
BASIC SCIENCES (PCB)	DOTT - 104	100	100	200
INTRODUCTION TO OPERATION THEATRE	DOTT- 105	100	100	200
PHARMACOLOGY	DOTT- 106	100	100	200
TOTAL				1200

SECOND YEAR

COURSE TITLE	PAPER CODE	MARKS		
		Theory	Practical	Total
SURGICAL PROCEDURES-ADVANCED	DOTT—210	100	100	200
GENERAL SURGICAL PRINCIPLES	DOTT —220	100	100	200
SURGICAL INSTRUMENTS AND MONITORING	DOTT —230	100	100	200
STERILISATION AND DISINFECTION	DOTT – 240	100	100	200
ANAESTHESIA ADMINISTRATION AND CARE	DOTT – 250	100	100	200
PRE AND POST-OP PATIENT CARE	DOTT —260	100	100	200
TOTAL				1200

1ST YEAR

GENERAL ANATOMY (DOTT-101)

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 cavity.
4. Cardio-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 cord, meningeal coverings.
7. Sensory organs – Skin, eyes, ears, tongue, nose.
8. Urinary system – kidney, ureter, urinary bladder-urethra
9. Reproductive system – male & female.

1ST YEAR

PHYSIOLOGY (DOTT-102)

Physiology – Gross physiology of the following system:

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. Endocrine glands – broad idea about metabolic processes, fluid and electrolyte balance, Pituitary, 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.

1ST YEAR

PATHO & MICRO (DOTT-103)

PATHOLOGY

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

MICROBIOLOGY

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. Anesthesia Techniques

- 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. Drugs used in Anesthesia

- Inducing agents
- Muscles relaxants & reversal
- Inhalational anesthesia
- Sedatives, hypnotics, analgesics
- Anticholinergic
- Antihypertensive

- Antiemetic
- Drugs used in obstetrics
- Anticholinergic
- Antihypertensive
- Antiemetic
- Drugs used in Obstetrics
- Anticholinesterase drugs
- Antiallergic drugs
- Antiallergic drugs
- Steroids
- Drugs used in cardiac arrest, shock
- Miscellaneous drugs
- Drugs used in local blocks, spinal & epidural

4. Gases

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

5. Boyle's apparatus

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

6. Intubating Equipments

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

7. Monitoring Equipment

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

8. Instruments used in Anesthesia

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

9. IV Fluids

- 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.

1ST YEAR

BASIC SCIENCES (PCB) (DOTT-104)

Applied Physics + Chemistry + Basic Computer

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, its effect on human bodies, methods of prevention of heat loss, rise or fall in temperature, its 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, Turbulent flow, critical Reynolds's number, Resistance to Laminar & Turbulent flow.
- ix. Pressure loss due to abrupt change in bore of tube. Principle of flow meters and its types.

Applied Chemistry:-

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

Computer Science:-

Introduction to programming

- Representation of 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,

1ST YEAR

INTRODUCTION TO OPERATION THEATRE (DOTT-210)

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**
- **O₂ 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, cystoscope.**
- **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**

1ST YEAR
PHARMACOLOGY (DOTT-250)

1. Introduction of Pharmacology
2. General principal of Pharmacology
3. Pharmacokinetics
4. Pharmacodynamics
5. Pharmacology of the Autonomics nervous system
6. Pharmacology of adrenergic drugs
7. Pharmacology of cholinergic drugs
8. Pharmacological management of congestive heart failure
9. Pharmacology of antiseizure agents
10. Serotonin pharmacology
11. Pulmonary pharmacology asthma

2nd YEAR
GENERAL SURGICAL PRINCIPLES (DOTT-220)

1.Prepare in Advance

- Use a pre-surgical checklist to ensure that necessary supplies (instruments, drugs, syringes, clipper, scrub, suture, heating pads, etc.) are available and preparatory steps completed before beginning surgery.
- *Arrange to have help available during the surgery.* While it is not impossible to perform surgical procedures alone, it is extremely difficult to do them well. A 'non-sterile' assistant should be used whenever possible.
- The surgeon should have a thorough understanding of the surgical procedure and practice on inanimate models and/or cadaver animals before using live animals whenever possible.

2.Use Aseptic Technique

- Aseptic technique encompasses all procedures designed to prevent the introduction of microbial contamination into the surgical wound. Failure to use correct aseptic technique may result in post-operative *wound infections, animal suffering and invalid research data.* Aseptic technique includes:
- The use of sterile instruments

- Appropriate surgical preparation of the patient
- The use of sterile gloves and appropriate attire
- Appropriate location for conducting the surgery
- Maintenance of sterility throughout the surgical procedure

3.Handle Tissues Gently

- Handle living tissue as gently as possible during surgery. Rough handling or crushing of tissues will lead to *swelling, inflammation and post-operative pain and discomfort* for the animal.
- Develop your surgical technique by practicing on inanimate models and/or cadaver animals before proceeding to live animals.

4.Use Appropriate Anesthetic and Monitoring

- General anesthesia is *required* during surgery. Anesthesia must be deep enough that the animal cannot feel pain yet not so deep that breathing and heart function are compromised. Respiration, cardiac function and anesthetic depth must be regularly monitored while the animal is anesthetized. Exactly how this is done will depend on the species of animal and type of surgical procedure.

5.Post-Operative Care

- Post-operatively, animals must be kept warm and *monitored closely* to ensure they recover from general anesthesia.
- Appropriate *analgesic medications* must be administered as needed.
- For 7 to 14 days after surgery, *daily observation and evaluation* is necessary to ensure there are no surgical complications (such as infection, bleeding, or poor wound healing) or unnecessary pain and distress.
- Complete surgical and post-operative *records are required*.

6.Unexpected Complications

Unexpected complications sometimes occur in association with surgery or postoperative recovery. A veterinarian must be consulted if there are complications that affect the welfare of the animal. Such complications may include infection, wound dehiscence, excessive weight loss, or higher than expected incidence of post-operative deaths. A veterinarian is available 24 hours a day by calling the Animal Resource Program Office at: 865-1495 (This phone number is posted in the animal facilities). If calling after hours, a recorded message will provide contact information.

7.Provide Post Procedural Care

Immediately following surgery or any procedure requiring general anesthesia, animals must

be monitored closely to ensure they recover uneventfully. Animals must be observed continuously until they regain a righting reflex. Post-operative analgesia is required for all procedures expected to cause more than momentary pain. Analgesia may not be withheld without prior IACUC approval.

After surgery the animal must be observed and evaluated at least once a day for 7-10 days or until the wound is healed or the animal is euthanized, whichever comes first. In certain situations, animals may need to be checked more frequently. Potential post-surgical complications include pain, distress, infection, bleeding, or delayed wound healing. ARP veterinary staff must be notified if animals develop unexpected post-surgical complications. ARP veterinarians are available 24 hours a day via phone.

8.Nonsurvival Rodent Surgery

In non-survival surgery the animal is not allowed to regain consciousness (i.e., euthanized prior to anesthetic recovery). Strict aseptic technique is not necessary for non-survival procedures. However, at a minimum, the surgical site should be clipped and scrubbed, the surgeon should wear gloves and instruments should be clean. The depth of anesthesia must be monitored throughout the procedure and adjusted as necessary.

2nd YEAR

SURGICAL INSTRUMENTS AND MONITORING (DOTT-230)

1. Common general surgical instruments;
2. Gynaecology and obstetrics instruments
3. Orthopaedic instruments
4. Ophthalmology instruments
5. E.N.T instruments
6. Urological instruments
7. Laparoscopic instruments
8. Monitoring- introduction and basic monitoring
9. Monitoring of cardio vascular system- pulse rate, blood pressure, ECG, CVP, ABG.
10. Monitoring of respiratory system- PFT, oxygen saturation, minute volume, ETCO₂.
11. Temperature monitoring.
12. Blood loss monitoring.
13. Urine output.

2nd YEAR
STERILISATION AND DISINFECTION (DOTT-240)

- 12. Introduction to cssd**
- 13. Layout of cssd**
- 14. Maintenance of cssd**
- 15. Roles and responsibilities of OT technician in cssd**
- 16. Zones of cssd**
- 17. Aim of cssd**
- 18. Terminology related to sterilization**
- 19. Instrument cleaning process**

Sterilization and disinfection

- 1. Methods of sterilization (physical and chemical)**
- 2. New methods of sterilization**

2nd YEAR
PRE AND POST-OP PATIENT CARE (DOTT-260)

- 1. Introduction to pre, intra and post-operative room.**
- 2. Routes of drug administration.**
- 3. Pre-operative preparation of the patient**
- 4. PAC (Pre anaesthesia Check-up) and investigations.**
- 5. I.C.U (Intensive Care Unit) Introduction – Procedure, Equipment's used in I.C.U.**
- 6. Patient care - Post-operative patient care and complications and their management.**
- 7. Fluid therapy**
- 8. PACU**
- 9. Methods of oxygen therapy**
- 10. Respiratory failure and its management**
- 11. Disaster management**
- 12. Transport of critically ill patient**
- 13. Shock, its types and management**

2ND YEAR
SURGICAL PROCEDURES-ADVANCE (DOTT-320)

- 1. Laparoscopic surgeries and instruments**
- 2. Robotic surgeries and instruments**
- 3. Endoscopic procedures and instruments**
- 4. Bariatric Surgery**
- 5. Cardio thoracic surgeries and instruments**
- 6. Neuro surgeries and instruments**
- 7. Plastic surgeries and instruments**
- 8. Neonatal and paediatric surgeries and instrument**

2ND YEAR
ANAESTHESIA ADMINISTRATION AND CARE (DOTT-340)

- 1. Introduction about anaesthesia**
- 2. History of anaesthesia**
- 3. Components of anaesthesia**
- 4. Choice of anaesthesia**
- 5. Types of anaesthesia**
- 6. General anaesthesia (technique of general anaesthesia)**
- 7. Local blocks**
- 8. Regional anaesthesia (nerve blocks, spinal block, epidural block)**
- 9. I.V regional block (bier's block)**
- 10. Medication used in anaesthesia**
- Induction agents (I.V induction agents, inhalational agents)**
- 11. Muscle relaxants**
- 12. Anti-cholinesterase drugs**
- 13. Gases used in o.t**
- 14. Local anaesthetics**
- 15. Anaesthesia workstation**
- 16. Anaesthesia equipment's (face masks, airways, E.T tubes, LMA'S, Magill forceps, Stylet, Bougie etc.)**
- 17. Piped medical gas and vacuum system.**