

# APPROVED SYLLABUS

2026

**Ministry of Health & Family**

**Welfare**

स्वास्थ्यम् सर्वार्थसाधनम्

NCAHP

Since-2021

सहबद्ध और स्वास्थ्य देख-रेख वृत्ति आयोग

The logo of the National Commission for Allied and Healthcare Professions (NCAHP) is a circular emblem. It features a central stylized figure in blue and green, surrounded by yellow and orange petals. The text "NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS" is written in a circle around the top, and "स्वास्थ्यम् सर्वार्थसाधनम्" is written in a circle around the bottom. The acronym "NCAHP" and "Since-2021" are in the center.

# Bachelor of Anaesthesia & Operation Theatre Technology (B.AOTT)

स्वास्थ्यम् सर्वार्थसाधनम्  
NCAHP  
Since-2021

## Bachelor of Anesthesia & Operation Theater Technology (B.AOTT)

### Introduction

**Learning Objectives** At the completion of this course, the student should be -

Able to help the anesthesiologist in administering anesthesia, assist in various procedures and also help in continuous monitoring of patients during surgery.

Able to independently handle the latest technology and high end biomedical equipment in Operation Theatre

Able to assist anesthesiologists in developing and implementing patient anesthesia care plans, including pre-operative, surgical theater, recovery room, and post-operative care procedures.

Able to do- patient data record keeping catheter insertion, airway management, assisting the administration and monitoring of regional and peripheral nerve blockades, support therapy, adjusting anesthetic levels during surgery, perioperative monitoring, postoperative procedures, patient education, and administrative tasks.

Able to manage medical gases and pipeline system

Able to assist in Intensive care unit

Able to manage Central sterile supply department and be well versed with sterile techniques for anesthesia and surgical procedures.

Able to assist during Disaster and emergency situations.

### Expectation from the future graduate in the providing patient care.

1. The Course prepares the operating theatre technologist to work as a competent, reliable member of the healthcare team under the guidance and supervision of doctors in their delivery of patient care, training also focuses on the knowledge and skills of monitoring infection control policy and procedures in the operating theatre.
2. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent trauma centres
3. OTT graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology, the professional should opt for continuous professional education credits offered by national and international institutes.

### Eligibility for

### admission Selection

### Procedure

1. Minimum qualification He/she has passed the Higher Secondary (10+2) or

equivalent examination recognized by any Indian University or a duly constituted Board with pass marks (50%) in physics, chemistry, biology (PCB) mandatory and mathematics (optional).

2. Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities will form the guideline to determine the eligibility and must have passed in the subjects: Physics, Chemistry and Biology (mandatory) and Mathematics (optional) up to 12th Standard level.
3. The qualifying examination passed by FN/PIO/CIWGC students should be considered equivalent to eligibility examination by the Association of Indian Universities/Academic Council

### Duration of the course

Duration of the course: 4 years or 8 semesters. (2140 hours of Theory & 920 hours of Practical Classes) and 1440 hours (minimum) of internship

Total hours – 4500

### Maximum period for completion of the course:

The maximum period for completion of the course is 6 years.

If a candidate does not complete within the 6 years, he/she should re-register.

### Medium of instruction

English shall be the medium of instruction for all the subjects of study and for examination of the course.

### Attendance:

A candidate has to secure minimum or as mandated by the State-

1. 75% attendance in theoretical
2. 80% in Skills training (practical) for qualifying to appear for the final examination.

No relaxation whatsoever will be permissible to this rule under any ground including indisposition etc.

A candidate having shortage of attendance shall repeat the exam when it is offered next.

### Teaching Tools:

The required tools to teach a course on surgical assistance and anaesthesia support may include the following:

#### a) Lecture Materials:

Comprehensive lecture notes.

Presentations and slides.

Handouts and reading materials.

#### b) Demonstration Models:

Anatomical models /simulators for demonstrating surgical techniques.

Simulators for practicing instrument handling and airway management.

c) Surgical Instruments:

Real surgical instruments (including laparoscopic, arthroscopic and Robotic instruments) for hands-on practice.

Simulated instruments for familiarization.

d) Audiovisual Aids:

Educational videos demonstrating surgical procedures.

Interactive simulations or virtual reality tools.

e) Anesthesia Equipment:

Anesthesia machines.

Monitors for vital signs and anesthesia administration.

Airway management devices.

Intravenous equipment.

f) Sterile Technique

Supplies:

Sterile

drapes.

Surgical gowns and gloves.

Sterile instruments and supplies.

g) Monitoring Equipment:

Monitors for vital signs, oxygen saturation, and end-tidal carbon dioxide levels, Neuromuscular monitoring, BIS.

h) Simulation Training:

High-fidelity patient simulators or mannequins for I.V Cannulation, Intubation, BLS & ACLS.

i) Clinical Observations:

Opportunities to observe actual surgical procedures.

Assistance in real-world clinical settings.

j) Case Studies and Scenarios

k) Customized case studies and scenarios for problem-solving and decision-making practice.

Assessment Tools:

1. Workshop, Quizzes, and written exams.
2. Practical assessments on instrument handling, sterile technique, and anaesthesia administration.
3. Simulated emergency scenarios for performance evaluation.

## Assessment and Evaluation

### Scheme of Evaluation

The academic performance is assessed on the basis of both Continuous Internal

Evaluation (CIE) assessment and End Semester Examination (ESE) in each semester

ESE weightage will be in the ratio of 30 % for CIE and 70 % for ESE.

### **Continuous Internal Evaluation (CIE)**

30% of the total marks is allotted for CIE in each course.

50% of CIE shall be based on the average of marks obtained in two notified formative written tests. Absence without prior permission for a formative test shall result in scoring of the test as zero.

The remaining 50% of CIE will be based on internal assessments in the form of evaluation seminars, journal club presentations, case presentations, completion of assignments etc. which will be specified in the individual course curricula.

CIE will be conducted for theory and practical for each course wherever applicable.

A Candidate must secure at least 40% of total marks fixed for CIE in the particular subject in order to be eligible to appear for the End Semester Examination (ESE) for that subject.

### **End semester examination (ESE)**

There shall be a University Examination at the end of each semester.

To be eligible to appear for university examination a candidate should fulfill all the following conditions

- Undergone satisfactorily the approved program of study in the course/ courses for the prescribed duration
- 75% attendance separately in theory and in practical/hospital postings, in each course
- Shall have the minimum attendance requirement in all courses of that semester for the first appearance
- Secure at least 50% of total marks fixed for CIE in a particular course; and
- Fulfill any other requirement that may be prescribed by the University from time to time.

The End semester examination will consist of Theory examination for all courses and in addition, Practical examination for specified courses.

Theory examination

- Written tests with question types, pattern, duration and weightage as specified in the Course-wise curricula
- Setting of question papers and evaluation of answer scripts as per University regulations

Practical examination

Broad outline would be in the form of Spotters, Demonstration of equipment handling, Case based discussions.

### **Criteria for pass:**

A Candidate must score 50% separately in theory and practical wherever applicable

to be declared as pass. In case of fail, subsequently a candidate has to appear for both theory and practical examination of the university in that particular course.

### Attendance and appearance for Exam:

Candidates not possessing required attendance in a particular course as prescribed by University will not be allowed to take up examinations and has to appear for supplementary examination whenever board conducts exam for the particular course very next time.

### Carry over benefit:

A candidate shall appear for all the subjects of that particular semester in the University examinations but failed in that semester can avail this benefit, provided:

- A candidate who fails in not more than 2 subjects in I semester is allowed to move to II semester. The candidate with back log subjects shall take both I semester backlog subjects as well as II semester subjects. The candidate with a backlog of not more than 2 subjects in II semester is allowed to go to the III semester till he/she clears all I semester subjects.
- The candidate with a backlog of not more than 2 subjects in III semester is allowed to go to the IV semester till he/she clears all II semester subjects.
- The candidate with a backlog of not more than 2 subjects in IV semester is allowed to go to the V semester till he/she clears all III semester subjects.
- The candidate with a backlog of not more than 2 subjects in V semester is allowed to go to the VI semester till he/she clears all IV semester subjects.
- Results of candidates will be declared at the end of VI semester only when the all backlog subjects are cleared by the candidates.

Maximum attempt: No more than three attempts shall be allowed for the candidate to pass the any subjects. If he/she fails to clear the any subjects within three attempts will be considered as withdrawal of the course.

## Model Curriculum Outline

### First Semester

| Sl. No.      | Course Titles                                                       | Hours      |            |            |
|--------------|---------------------------------------------------------------------|------------|------------|------------|
|              |                                                                     | Theory     | Practical  | Total      |
| BAOTT-001    | Introduction to Healthcare Delivery System in India                 | 80         | 0          | 80         |
| BAOTT-002    | Medical Terminology and Record keeping (including anatomical terms) | 50         | 0          | 50         |
| BAOTT-003    | Anatomy                                                             | 100        | 40         | 140        |
| BAOTT-004    | Physiology                                                          | 100        | 40         | 140        |
| BAOTT-005    | Health Care Quality & Patient Safety                                | 60         | 40         | 100        |
| <b>TOTAL</b> |                                                                     | <b>390</b> | <b>120</b> | <b>510</b> |

### Second Semester

| Sl. No.      | Course Titles                                                              | Hours      |            |            |
|--------------|----------------------------------------------------------------------------|------------|------------|------------|
|              |                                                                            | Theory     | Practical  | Total      |
| BAOTT-006    | Medical Law and Ethics, Professionalism & Values, Principles of Management | (30+10+30) | 0          | 70         |
| BAOTT-007    | Basics of Biomedical sciences in surgery and Anaesthesia                   | 40         | 60         | 100        |
| BAOTT-008    | Biochemistry & Haematology                                                 | (40+30)    | (0+30)     | 100        |
| BAOTT-009    | Pathology & Microbiology                                                   | (50+50)    | 0          | 100        |
| BAOTT-010    | Basic Concepts in Pharmacology                                             | 40         | 0          | 40         |
| BAOTT-011    | Basic computers and information Science, Communication and soft skills.    | 40         | 60         | 100        |
| <b>TOTAL</b> |                                                                            | <b>360</b> | <b>150</b> | <b>510</b> |

### Third Semester

| Sl. No.   | Course Titles                   | Hours  |           |       |
|-----------|---------------------------------|--------|-----------|-------|
|           |                                 | Theory | Practical | Total |
| BAOTT-012 | Basic techniques of Anaesthesia | 100    | 50        | 150   |
| BAOTT-013 | Basics of Surgical procedures   | 100    | 50        | 150   |
| BAOTT-014 | CSSD & Manifold Area.           | 50     | 100       | 150   |

|               |                                             |            |            |            |
|---------------|---------------------------------------------|------------|------------|------------|
| BAOTT-01<br>5 | Industrial orientation and Industrial Visit | 60         | 0          | 60         |
| <b>TOTAL</b>  |                                             | <b>310</b> | <b>200</b> | <b>510</b> |

#### Fourth Semester

| SL No.        | Course Titles                          | Hours      |               |            |
|---------------|----------------------------------------|------------|---------------|------------|
|               |                                        | Theor<br>y | Practic<br>al | Tot<br>al  |
| BAOTT-01<br>6 | AdvancedAnaesthesiaTechniques          | 100        | 50            | 150        |
| BAOTT-01<br>7 | Advanced Surgical Procedures           | 100        | 50            | 150        |
| BAOTT-01<br>8 | Basic Intensive Care                   | 50         | 100           | 150        |
| BAOTT-01<br>9 | Clinical Medicine & Related Management | 60         | 0             | 60         |
| <b>TOTAL</b>  |                                        | <b>310</b> | <b>200</b>    | <b>510</b> |

#### Fifth Semester

| SL No.        | Course Titles                                    | Hours      |               |            |
|---------------|--------------------------------------------------|------------|---------------|------------|
|               |                                                  | Theor<br>y | Practic<br>al | Tot<br>al  |
| BAOTT-02<br>0 | SpecializedAnaesthesia1                          | 100        | 50            | 150        |
| BAOTT-02<br>1 | Specialized surgery 1                            | 100        | 50            | 150        |
| BAOTT-02<br>2 | Recent Advances inAnaesthesiaand Surgical fields | 100        | 0             | 100        |
| BAOTT-02<br>3 | Community Medicine & Environmental Sciences      | 50+60      | 0             | 110        |
| <b>TOTAL</b>  |                                                  | <b>410</b> | <b>100</b>    | <b>510</b> |

#### Sixth Semester

| SL No.        | Course Titles                     | Hours      |               |           |
|---------------|-----------------------------------|------------|---------------|-----------|
|               |                                   | Theor<br>y | Practic<br>al | Tot<br>al |
| BAOTT-02<br>4 | SpecializedAnaesthesia2           | 100        | 50            | 150       |
| BAOTT-02<br>5 | Specialized Surgery 2             | 100        | 50            | 150       |
| BAOTT-02<br>6 | SpecializedAnaesthesia& Surgery 3 | 100        | 50            | 150       |

|               |                                        |            |            |            |
|---------------|----------------------------------------|------------|------------|------------|
| BAOTT-02<br>7 | Research Methodology and Biostatistics | 60         | 0          | 60         |
|               | <b>TOTAL</b>                           | <b>360</b> | <b>150</b> | <b>510</b> |

### Seven & Eighth Semester

| Sl. No.       | Course Titles                                                                                                               | Hours      |               |           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------|------------|---------------|-----------|
|               |                                                                                                                             | Theor<br>y | Practic<br>al | Tota<br>l |
| BAOTT-02<br>8 | AOTT Internship (should contain six months of Anaesthesia, six months of surgery, and at least one month of each specialty) | -          | 1440          | 1440      |

## **Bachelor of Operation Theater Technology (B.AOTT)**

|             |                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PO 1</b> | Apply fundamental concepts of anatomy, physiology, pathology, microbiology, and pharmacology in the context of anaesthesia and operation theatre technology.                           |
| <b>PO2</b>  | Demonstrate the ability to manage operation theatre environments effectively, maintaining asepsis, equipment readiness, and compliance with safety protocols.                          |
| <b>PO3</b>  | Assist anaesthesiologists competently during preoperative, intraoperative, and postoperative procedures, including patient monitoring, airway management, and anaesthetic maintenance. |
| <b>PO4</b>  | Support surgeons by preparing and maintaining sterile fields, handling surgical instruments, and assisting in various surgical specialties with precision and professionalism.         |
| <b>PO5</b>  | Implement standard infection control practices, including sterilization, disinfection, and CSSD operations, ensuring patient and staff safety.                                         |
| <b>PO6</b>  | Operate, maintain, and troubleshoot biomedical and anaesthetic equipment such as ventilators, monitors, and suction units with technical accuracy.                                     |
| <b>PO7</b>  | Ensure patient comfort, dignity, and safety throughout perioperative care, demonstrating empathy and ethical responsibility.                                                           |
| <b>PO8</b>  | Recognize and respond promptly to anaesthetic and surgical emergencies, applying knowledge of resuscitation and crisis management.                                                     |
| <b>PO9</b>  | Exhibit professional behavior, confidentiality, accountability, and adherence to ethical and legal standards in healthcare settings.                                                   |
| <b>PO10</b> | Communicate effectively with patients, surgeons, anaesthesiologists, and multidisciplinary healthcare teams, fostering collaboration and coordination.                                 |
| <b>PO11</b> | Engage in continuous learning, research, and professional development to adapt to advances in anaesthesia, surgery, and healthcare technology.                                         |
| <b>PO12</b> | Apply knowledge of public health, epidemiology and preventive healthcare to contribute to community well-being and national health programs.                                           |

### Subject: Remedial English

|                                                             |                                              |
|-------------------------------------------------------------|----------------------------------------------|
| Theory hours                                                | 30                                           |
| Practical/<br>Demonstration<br>hours                        |                                              |
| Lecture<br>Practical/ Demonstration<br>Method of Assessment | 01 Hours per week<br><br>Written examination |

**Course Description:** The course is designed for the students from non-English Boards by introducing and improving their spoken English knowledge and speaking skills apropos their professional work.

**Objectives: After completing this course the students will be able to:**

- Read and write correct English.
- Communicate effectively in English language.
- Demonstrates skill in writing and speaking English language.

### COURSE OUTCOMES

***At the end of the course students should be able to...***

**C01:** Analyze and restate the meaning of a text in English

**C02:** Demonstrate the skill to write in English without grammatical error

**C03:** Practice listening effectively to communication in English

**C04:** Develop the ability to speak English language with the right way of pronunciation.

**C05:** Express the viewpoints with confidence in English

**C06:** Express values and skills gained through effective communication to other disciplines

**C07:** Compose articles and compositions in English

**C08:** Discuss and socialize effectively in English

**Unit I Language-Basic**

**(05 hours)**

Content: Review of grammar, Remedial study of grammar, building vocabulary

Introduction

Parts of speech

Exercise on use of grammar:

Tense, Number, Gender

Assessment methods: Objective type, Fill in the blanks.

## **Unit II**

**(03 hours)**

Read and comprehend prescribed course books

Reading, Summarizing, Comprehension

Assessment methods: Fill in the blanks and One-mark questions.

## **Unit III**

**(06 hours)**

### **Various Forms of Composition**

Letter writing

Note taking

Precise writings

Diary writing

Reports on health problems etc.

Official correspondence:

Outgoing correspondence, replying to incoming correspondence, writing circulars, notices, charge memos, note taking, writing summaries, observation reports.

Teaching learning activities: Exercise on writing: Letter writing, resume/ CV Essay writing.

**Assessment methods:** Applications, short reports to be written.

## **Unit IV**

**(10 Hours)**

Objectives: Develop skill in spoken English

Content: English- Spoken mode, Debates, Telephonic conversion, formal & informal conversation:

Agreeing emphasizing, interrupting politely opinions, interviews, and visual presentation.

Teaching learning activities: Participating in seminar,

Telephonic conversion, conversation in

different situations, practice in public speaking

**Assessment methods:** Assessment of the skills.

## Unit V

(06 Hours)

Content: Listening to comprehensions, media, audio, video, speeches, definition of listening, types of listening, purposes of listening, obstacles for listening, contexts of listening, to be a good listener, listening to a lecture etc.

Teaching learning activities: Listening to audio, video tapes and identify the key points.

**Assessment methods:** Practical test of listening and filling out the blanks

There shall be examination for 100 marks at the end of the academic year, which will be conducted by the college.

## Reference Books:

**Tom Koorkkalkal, Communicative English for General Nursing Students, K.J. Publications, 2008**

*King's English*, Addone Publishing Group,

Thiruvananthapuram. John Ellison Kahn & others,

*to write and speak Better*

## First Semester- Foundation course

### BAOTT-001: Introduction to Healthcare Delivery System in India. (80 Hours)

#### Learning Objectives

Credit:4

Understanding the key features of the Indian healthcare delivery system, comparing it to other countries, evaluating community participation in healthcare, understanding the role of the private sector in healthcare, familiarizing oneself with the National Health Mission and National Health Policy, identifying issues and challenges, and exploring the background, objectives, and operations of national health programmes are the learning objectives of this course. The course also covers the AYUSH medical system, India's past, present, and future health scenarios, demography, vital statistics, epidemiological concepts, disease transmission, and disease monitoring in infectious and non-communicable diseases.

#### Introduction to National Healthcare Delivery System

The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world. Topics to be covered under the subject are as follows:

##### Unit 1: Introduction to healthcare delivery system

-15 Hours

- a) Healthcare delivery system in India at primary, secondary and tertiary care
- b) Community participation in healthcare delivery system
- c) Health system in developed countries.
- d) Private Sector
- e) National Health Mission
- f) National Health Policy
- g) Issues in Health Care Delivery System in India

**Unit 2:** National Health Programme Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme. 10 Hours

##### Unit 3: Introduction to AYUSH system of medicine.

-15 Hours

- a) Introduction to Ayurveda.
- b) Yoga and Naturopathy
- c) Unani
- d) Siddha
- e) Homeopathy
- f) Need for integration of various system of medicine

##### Unit 4: Health scenario of India- past, present, and future.

-5 Hours

Demography & Vital Statistics-

-10 Hours

- a) Demography – its concept
- b) Vital events of life & its impact on demography

- c) Significance and recording of vital statistics
- d) Census & its impact on health policy

**Unit 5: Epidemiology**

-25 Hours

- a) Principles of Epidemiology
- b) Natural History of disease
- c) Methods of Epidemiological studies
- d) Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

**BAOTT-001: Course Outcomes (COs): Introduction to Healthcare Delivery System in India**

|            |                                                                                                                                                |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Describe the structure and organization of the healthcare delivery system in India at national, State, District and community levels.          |
| <b>CO2</b> | Explain the National Health Programs and policies and their role in improving public health outcomes.                                          |
| <b>CO3</b> | Explain the roles and Functions of various healthcare institutions and agencies involved in health service delivery                            |
| <b>CO4</b> | Analyze the challenges and reforms in the Indian Healthcare system, including issues related to accessibility, equity and quality of care      |
| <b>CO5</b> | Demonstrate understanding of the role of healthcare professionals in promoting efficient and ethical healthcare delivery.                      |
| <b>CO6</b> | Acquires knowledge about concept, methodology of demographics and epidemiology with epidemiology of communicable and non-communicable diseases |

**BAOTT-002: Medical Terminology and Record keeping (including anatomical terms)**

**Credit 3**

**(50 Hours)**

**Medical terminologies and record keeping**

This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests.<sup>25</sup> Topics to be covered under the subject are as follows:

**Unit 1:**

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.

**Unit 2:**

4. Basic medical terms.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.

### **Unit 3:**

7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
8. Interpret medical orders/reports.
9. Data entry and management on electronic health record system.

## **BAOTT-002: Course Outcomes (COs): Medical Terminology and Record keeping (including anatomical terms)**

|            |                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>C01</b> | Define and interpret basic medical terminology including prefixes, suffixes and root words used in healthcare.          |
| <b>C02</b> | Recognize and correctly use medical abbreviations and symbols in documentation and communication.                       |
| <b>C03</b> | Explain the structure and format of medical records, including patient history, progress notes and reports.             |
| <b>C04</b> | Identify the types and importance of health records, such as inpatient, outpatient, laboratory, and diagnostic records. |
| <b>C05</b> | Apply knowledge of medical terminology to interpret and document clinical information effectively.                      |
| <b>C06</b> | Describe the role of electronic health records (EHRs) and digital systems in modern healthcare documentation.           |

## **BAOTT-003: Anatomy**

**(100 Hours)**

### **Learning Objectives**

**Credit 6 (4+2)**

The course aims to teach basic anatomical terminology, identify bones and features of the limbs, thorax, lungs, and heart, comprehend the muscular system, investigate excretory, digestive, and nervous systems, comprehend the gastrointestinal tract, and comprehend the structure and function of the central nervous system. Students will also learn surface anatomy and radiological interpretation abilities. Understanding the relationship between the muscular system and specific actions, describing the excretory and digestive systems, explaining the structure and function of the central nervous system, and applying surface anatomy and radiology interpretation techniques are among the course outcomes.

### **Basic anatomy**

**Unit 1:** Introduction to Anatomy: Basic Anatomical terminology

a) Osteology- -20 Hours

Upper limb – clavicle, scapula, humerus, radius, ulna,

Lower limb - femur, hip bone, sacrum, tibia, fibula & Vertebral column

b) Thorax – Intercostal space, pleura, bony thoracic cage, ribs sternum & thoracic vertebrae 8 Hours

c) Lungs – Trachea, bronchial tree. - 6 Hours

**Unit 2:** Heart – Surface anatomy of heart, chambers of the heart, valves of the heart, and major blood vessels of heart, pericardium, and coronary arteries 10 Hours

**Unit 3:** Skeleton-muscular system – Muscles of thorax, muscles of upper limb (arm & forearm) Flexor and extensor group of muscles (origin, insertion, action) -10 Hours

**Unit 4:** Excretory system – Kidneys, ureters, bladder- 6 Hours

Digestive System: -20 Hours

Structure and function of the digestive

system Oral cavity and digestive enzymes

Anatomy and function of the gastrointestinal tract

Absorption and digestion of nutrients

Common digestive disorders

**Unit 5:** Nervous System: -20 Hours

Structure and function of neurons

Organization of the central nervous system (brain and spinal cord) Peripheral nervous system and its divisions

Cranial nerves and spinal nerves

Basic principles of

neurophysiology

### Practical in Anatomy

(40 Hours)

Mannequin to be provided for Teaching Osteology – Bones identification (right and left side) and prominent features and muscle attachment of the bone, clavicle, scapula, radius, ulna, humerus, femur, hip bone, sacrum, tibia, fibula. Surface Anatomy, Organ Anatomy (Heart, Lungs, Stomach, Liver, Spleen, Kidney, Urinary tract, Testis, Female reproductive organs), Radiology, and X-ray Chest PA view.

### BAOTT-003: Course Outcomes (COs): Anatomy

|     |                                                                             |
|-----|-----------------------------------------------------------------------------|
| CO1 | Identify and describe anatomical aspects of muscles, bone and joints.       |
| CO2 | Knowledge of various surface landmarks.                                     |
| CO3 | To introduce and familiarize students with the concept of human anatomy     |
| CO4 | Identify and describe components of Head & Neck.                            |
| CO5 | To make them learn about embryology, histology, anatomy of abdomen & thorax |

|            |                                                                      |
|------------|----------------------------------------------------------------------|
| <b>CO6</b> | Identify and describe central nervous and peripheral nervous system. |
|------------|----------------------------------------------------------------------|

## **BAOTT-004: Physiology**

**(100 Hours)**

### **Learning Objectives**

**Credit(4+2)**

Learn about cellular physiological processes, blood composition and functions, cardiovascular, respiratory, excretory, reproductive, central nervous, endocrine, gastrointestinal tract, vital signs, electrocardiogram interpretation and respiratory examinations. Learn how to take vital signs, interpret electrocardiograms and do respiratory tests. Learn about the activities of the central nervous system and the endocrine system, as well as the physiological architecture of the gastrointestinal tract.

### **Physiology**

#### **Unit 1: The Cell:**

**-8 Hours**

- d) Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis)

#### **The Blood:**

**- 10 Hours**

- a) Composition of Blood, functions of the blood and plasma proteins, classification and protein, Blood Cascade, Bleeding and Clotting time.
- b) Pathological and Physiological variation of the RBC.
- c) Function of Haemoglobin
- d) Erythrocyte Sedimentation Rate.
- e) Detailed description about WBC-Total count (TC), Differential count (DC) and functions.
- f) Platelets – formation and normal level and functions.
- g) Blood groups and Rh factor

#### **Unit 2: Cardio-Vascular System:**

**- 15 Hours**

- a) Physiology of the heart.
- b) Heart sounds.
- c) Cardiac cycle, Cardiac output.

- d) Auscultation
- e) Arterial pressures, blood pressure.
- f) Hypertension.
- g) Electro cardiogram (ECG.)

**Unit 3:** Respiratory system: - 10 Hours

- a) Respiratory ventilation
- b) Oxygenation
- c) Definitions and Normal values of Lung volumes and Lung capacities.

**Unit4:** Excretory system: - 10 Hours

- a) Renal System:
- b) Urine volume and specific gravity measurements
- c) Renal function tests, including assessment of glomerular filtration rate (GFR)
- d) Analysis of renal tubular function
- e) Study of renal handling of electrolytes and water
- f) Assessment of acid-base balance and renal regulation ~~off~~.

**Unit5:** Reproductive system: - 8 Hours

- a) Formation of semen and spermatogenesis.
- b) Brief account of menstrual cycle.

Central Nervous system: -9 Hours

- a) Functions of CSF.

Endocrine system: - 10 Hours

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

Digestive system: - 10 Hours

- a) Physiological Anatomy of the GIT.
- b) Food Digestion in the mouth, stomach, intestine
- c) Absorption of foods
- d) Role of bile in the digestion.

**Unit6:** Special Senses: - 10 Hours

Vision testing and assessment of visual acuity  
 Auditory tests and assessment of hearing function  
 Study of taste and olfaction perception  
 Analysis of vestibular system and balance control  
 Assessment of proprioception and kinesthetic sense

## Practical in Physiology

(40 Hours)

- a) Determination of Blood Groups.
- b) Vital signs measurement: Students can learn how to measure and interpret vital signs, including blood pressure, heart rate, respiratory rate, and body temperature. This may involve using instruments such as sphygmomanometers, stethoscopes, and thermometers.
- c) Electrocardiography (ECG): Students can practice performing and interpreting electrocardiograms to study the electrical activity of the heart. This may involve placing electrodes on the body to record the ECG waveform and analyzing abnormalities.
- d) Spirometry: Students can learn how to perform spirometry tests to measure lung function. This involves using a spirometer to assess parameters such as tidal volume, vital capacity, forced expiratory volume, and peak expiratory flow rate.
- e) Examination of Respiratory system to count respiratory rate and measure inspiration and respiration.

### BAOTT-004: Course Outcomes (COs): Physiology

|            |                                                                                       |
|------------|---------------------------------------------------------------------------------------|
| <b>CO1</b> | Acquire the knowledge of the acid base balance and disturbances of acid base balances |
| <b>CO2</b> | Knowledge of composition of blood.                                                    |
| <b>CO3</b> | Describe the pathological and Physiological variation of the RBC.                     |
| <b>CO4</b> | Describe and discuss the WBC-Total count (TC), Differential count (DC) and functions  |
| <b>CO5</b> | Able to explain blood group, Rh factor and platelets.                                 |
| <b>CO6</b> | Identify the physiology and functions of cardio vascular system                       |

## Hours) Learning Objectives

Credit:

5 (3+2)

Learn essential life support and emergency care procedures, such as vital sign and primary

assessment, infection prevention and control principles, and recognizing prevalent healthcare-associated infections. Identify and implement infection prevention and control methods, as well as enhance environmental safety through biomedical waste management. Proficiency in BLS procedures, accurate vital sign assessment, infection prevention and control, and environmental safety through biomedical waste management practices are among the course outcomes.

Quality assurance and management, antibiotic resistance, disaster readiness, and disaster preparedness are among the learning objectives. Understanding the core concepts of care quality, approaches to improvement, standards, and instruments for improving healthcare procedures are all part of quality assurance. Antibiotic resistance is an increasing concern in healthcare settings, with a variety of forms, trends, and tactics required to effectively combat it. Principles and strategies for antimicrobial stewardship are also discussed. Understanding psychological effect management, resource management, readiness and risk reduction concepts, critical response functions, institutional procedures, and the importance of information management in coordinating and communicating during catastrophes are all part of disaster preparedness and management.

The course covers four key areas of healthcare management: quality assurance and management, antibiotic resistance, disaster preparedness and management. Students will learn to apply quality of care concepts, implement quality improvement approaches, adhere to standards, and use tools to identify areas for improvement. They will also understand the significance of NABH guidelines and their role in promoting quality and patient safety in healthcare organizations.

Antibiotic resistance is addressed by understanding factors contributing to its spread, different types of resistance, monitoring trends, advocating for actions and policies, and implementing antimicrobial stewardship practices. Disaster preparedness and management involves applying emergency management principles, managing the psychological impact, managing resources efficiently, developing preparedness plans, coordinating key response functions, contributing to recovery, rehabilitation, and reconstruction efforts, and utilizing information management systems for effective communication and coordination during disasters.

**Basics of emergency care and life support skills.**

**(25 Hours)**

**Unit 1:** Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden

cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the subject are as follows:

- a) Vital signs and primary assessment
- b) Basic emergency care – first aid and triage
- c) Ventilations including use of bag-valve-masks (BVMs)
- d) Choking, rescue breathing methods
- e) One- and Two-rescuer CPR
- f) Using an AED (Automated external defibrillator).
- g) Managing an emergency including moving a patient

At the end of this topic, focus should be to teach the students to perform the maneuvers in simulation lab and to test their skills with focus on airways management and chest compressions. At the end of the foundation course, each student should be able to perform and execute/operate on the above-mentioned modalities.

## **Unit 2: Infection prevention and control.**

**(15 Hours)**

The objective of this section will be to provide a broad understanding of the core subject areas of infection prevention and control and to equip AHPs with the fundamental skills required to reduce the incidence of hospital acquired infections and improve health outcomes. Concepts taught should include –

- a) Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)],
- b) Prevention & control of common healthcare associated infections,
- c) Components of an effective infection control program, and
- d) Guidelines (NABH and JCI) for Hospital Infection Control

## **Unit 3: Bio medical waste management and environmental safety. (8 Hours)**

The aim of this section will be to help prevent harm to workers, property, the environment, and the public. Topics to be covered under the subject are as follows:

- a) Definition of Biomedical Waste
- b) Waste minimization
- c) BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
- d) Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- e) BMW Management & methods of disinfection
- f) Modern technology for handling BMW

- g) Use of Personal protective equipment (PPE)
- h) Monitoring & controlling of cross infection (Protective devices)

#### Unit 4: Quality assurance and management.

(12 Hours)

The objective of the course is to help students understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system.

- a) Concepts of Quality of Care
- b) Quality Improvement Approaches
- c) Standards and Norms
- d) Quality Improvement Tools
- e) Introduction to NABH guidelines

#### BAOTT-005: Course Outcomes (COs): Health Care Quality & Patient Safety

|            |                                                                                                                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Explain the concepts of BLS, SCA, CPR and AED.                                                                                                                                                                   |
| <b>CO2</b> | Describe the broad understanding of infection prevention and control and to equip AHPs with the fundamental skills required to reduce the incidence of hospital acquired infections and improve health outcomes. |
| <b>CO3</b> | Identify concept of Bio medical waste management and environmental safety.                                                                                                                                       |
| <b>CO4</b> | Discuss the principles and practices of patient safety, including risk management and error prevention strategies.                                                                                               |
| <b>CO5</b> | Recognize the role of healthcare professionals and teamwork in promoting a culture of safety and continuous quality improvement                                                                                  |
| <b>CO6</b> | Apply the basic concepts of NABH guidelines.                                                                                                                                                                     |

## **Second Semester**

### **BAOTT-006: Medical Law and Ethics, Professionalism & Values, Principles of Management (70 Hours)**

#### **Learning Objectives**

**Credit: 4**

This course delves into the legal and ethical issues that arise in medical practice. Medical ethics, confidentiality, informed consent, euthanasia, organ transplantation, medico-legal implications of medical data, and professional indemnity insurance are among the topics covered.

The professionalism module emphasizes the significance of professionalism in the healthcare system and its impact on the patient environment. It addresses professional values like integrity, objectivity, competence, confidentiality, ethical or moral values, attitude and behavior, code of conduct, professional accountability, responsibility, misconduct, differences between professions, team efforts, and cultural issues in the healthcare setting. The programme emphasizes the value of collaboration and adhering to ethical norms in the healthcare system.

This course focuses on management principles and functions in a variety of situations, including healthcare organizations. Planning, organizing, directing, controlling, motivation, communication, leadership, coordination, human management, financial management, and healthcare technology management are among the themes covered.

#### **Medical law and ethics**

**(30 Hours)**

Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of

human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.<sup>26</sup>

Medical ethics has developed into a well based discipline which acts as a “bridge” between theoretical bioethics and the bedside. The goal is “to improve the quality of patient care by identifying behavior and attempting to resolve the ethical problems that arise in practice” Doctors are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. Hence, it is now a universal consensus that legal and ethical considerations are inherent and inseparable parts of good medical practice across the whole spectrum. Few of the important and relevant topics that need to focus on are as follows:

#### **Unit 1:**

- a) Medical ethics – Definition – Goal – Scope
- b) Introduction to Code of conduct
- c) Basic principles of medical ethics – Confidentiality
- d) Malpractice and negligence – Rational and irrational drug therapy
- e) Autonomy and informed consent – Right of patients
- f) Care of the terminally ill- Euthanasia
- g) Organ transplantation
- h) Medico legal aspects of medical records – Medico legal 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.
- i) Professional Indemnity insurance policy
- j) Development of standardized protocol to avoid near miss or sentinel events.
- k) Obtaining an informed consent.

#### **Professionalism and values.**

**(10 hours)**

**Unit 2:** The module on professionalism will deliver the concept of what it means to be a professional and how a specialized profession is different from a usual vocation. It also explains how relevant is professionalism in terms of healthcare system and how it affects the overall patient environment.

Professional ethics act (2002)

Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality

Personal values- ethical or moral values

Attitude and behavior- professional behavior, treating people equally.

Code of conduct, professional accountability and responsibility, misconduct

Differences between professions and importance of team efforts

Cultural issues in the healthcare environment

## Principals of Management

(30 Hours)

### Unit 3: Principles of management:

-20 Hours

- a) Development of Management: Definitions of Management – Contributions of F.W. Taylor, Henry Fayol, and others.
- b) Functions of Management: Planning – Organizing – Directing – Controlling  
Planning: Types of planning – Short-term and long plans – Corporate or Strategic Planning – Planning premises – Policies – Characteristics and sources – principles of policy making – Strategies as different from policies – Procedures and methods – Limitations of planning.
- c) Organizing: Importance of organization – Hierarchy – Scalar chain – Organization relationship – Line relationship – Staff relationship – Line staff relationship – Functional relationship – Committee organization – Management committees – Departmentation.
- d) Motivation: Motivation theories – McGregor's theory X and theory Y – Maslow's and Herzberg's theory – Porter and Lawler model of complex view of motivation – Other theories – Diagnostic signs of motivational problems – Motivational Techniques.
- e) Communication: Types of communication – Barriers of effective communication – Techniques for improved communication.

- f) Directing: Principles relating to Direction process – Principles and theories of leadership – Leadership Styles – Delegation of authority. Controlling: Span of control – Factors limiting effective span of control – Super management, General managers, Middle managers and supervisors – Planning and controlling relationships – Management control process – Corrective measures – Strategic control points – Budgetary control – Types of budgets.
- g) Co-ordination Co-ordination and co-operation – Principles of co-ordination – Techniques of co-ordination charts and records – Standard procedure instructions.
- h) Acts: CPA Act (1986 & 2019), BMW Act (1998, 2016), Drugs Act (1940), IMC Act (1956), Patient Privacy – IT Rules, 2011
- i) Medical Malpractice sections: - 304A, 337 and IPC 1860.

#### Personnel management:

- 5 Hours

**Unit 4:** Objective of Personnel Management – Role of Personnel Manager in an organization – Staffing and work distribution techniques – Job analysis and description – Recruitment and selection processes – Orientation and training – Coaching and counseling – disciplining – Complaints and grievances – Termination of employees – Performance appraisal – Health and safety of employees – Consumer Protection Act as applicable to health care services.

#### Financial management:

- 5 Hours

**Unit 5:** Definition of financial Management – Profit maximization – Return maximization – wealth maximization – Short term Financing – Intermediate Financing – Long term Financing – leasing as a source of Finance – cash and Security Management – Inventory Management – Dividend policies – Valuations of Shares – Financial Management in a hospital – Third party payments on behalf of patients. Insurance – health schemes and policies.

### **BAOTT-006: Course Outcomes (COs): Medical Law and Ethics, Professionalism & Values, Principles of Management**

|            |                                                                                                                                                            |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01</b> | Describe the Medical ethics has developed into a well based discipline.                                                                                    |
| <b>C02</b> | Explain the goal is to improve the quality of patient care by identifying, behavior and attempting to resolve the ethical problems that arise in practice. |
| <b>C03</b> | Identify the development of standardized protocol to avoid near miss or sentinel events.                                                                   |
| <b>C04</b> | Describe the Cultural issues in the healthcare environment.                                                                                                |
| <b>C05</b> | Understand health and safety of employees consumer Protection act as                                                                                       |

|            |                                                                                                                                          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------|
|            | applicable to health care services.                                                                                                      |
| <b>CO6</b> | Implement the financial Management in a hospital as third party payments on behalf of patient eg: Insurance health schemes and policies. |

**BAOTT-007: Basics of Biomedical sciences in surgery and Anaesthesia (40 Hours) Learning Objectives**  
**Credit: 3**

This course introduces biomedical engineering principles and technology in the realms of surgery and anaesthesia. It discusses surgical and anaesthesia devices, biomedical imaging, surgical navigation and guidance systems, anaesthesia delivery and monitoring, healthcare technology management, and ethical and legal issues in biomedical engineering.

This course contains following modules:

**Unit 1: Introduction to Biomedical Engineering in Surgery and Anaesthesia - 4 Hours**  
Surgical and Anesthesia Devices (OT Table, OT light, Infusion Pumps, TCA pumps, Video Laryngoscopes, Bronchoscopes, Diathermy, Drills, Coagulation devices like E.S. U's, LASER, Ultrasonic devices, RF Devices and Harmonic Scalpels, 12 Lead ECG), and Physical laws behind Transducer, EtCO2 monitor, Pulse oximeter, Blood pressure monitor.

- 15 Hours

Surgical Microscope. - 2 Hours

Laparoscopic cart (including various scopes), Veress needle, Trocars, and various instruments. - 2 Hours

**Unit 2: Biomedical Imaging in Surgery and Anaesthesia - 6 Hours**

Principles and technologies of medical imaging (e.g., X-ray, computed tomography, magnetic resonance imaging) Image-guided surgical procedures and interventions

Image processing and analysis techniques for surgical planning and intraoperative guidance

Advances in real-time imaging and its integration into surgical and Anaesthesia workflows

**Unit 3: Surgical Navigation and Guidance Systems - 2 Hours**

Principles of surgical navigation systems and their applications

Use of imaging, tracking, and registration techniques in surgical navigation.

## Anesthesia Delivery and Monitoring.- 9 Hours

Anaesthesia machines and delivery systems

Design and development of Anesthesia monitoring devices.

Physiological monitoring parameters and their interpretation during Anesthesia

Advances in Anesthesia technology, such as closed-loop Anaesthesia delivery systems.

### **BAOTT-007: Course Outcomes (COs): Basics of Biomedical sciences in surgery and Anaesthesia**

|            |                                                                                                                            |
|------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Describe this course introduces biomedical engineering principles and technology in the realms of surgery and anaesthesia. |
| <b>CO2</b> | Explain the Surgical and Anesthesia Devices.                                                                               |
| <b>CO3</b> | Categorize the Biomedical Imaging in Surgery and anaesthesia                                                               |
| <b>CO4</b> | Describe the Principles of surgical navigation systems and their applications.                                             |
| <b>CO5</b> | Summarize the design and development of Anesthesia monitoring devices.                                                     |
| <b>CO6</b> | Identify the advances in Anesthesia technology, such as closed-loop Anaesthesia delivery systems.                          |

## **BAOTT-008 Biochemistry & Haematology**

**Credit: 3 (2+1)**

**(40+30 Hours)**

### **Unit 1: Bio-chemistry**

**(40 Hours)**

Vitamins & Minerals: Fat soluble vitamins (A, D, E, K) – Water soluble vitamins – B-complex vitamins – principle elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine, and sulfur) – Trace elements – Calorific value of foods – Basal metabolic rate (BMR) – respiratory quotient (RQ). - 30 Hours

Acids and bases: Definition, pH, Henderson – Hassel Balch equation, Buffers, Indicators, Normality, Molarity, Molality. 10 Hours

### **Unit 2: Hematology**

**(30 Hours)**

Hemoglobin, blood cell counts, differential count 5 Hours.

Anemia, polycythemia 5 Hours

Thrombocytopenia 5 Hours

Coagulation parameters- BT, CT, PT, INR, APTT 5 Hours

Coagulation disorders- 5 Hours

Blood transfusion-hazards and complications 5 Hours

### **Practical (Hematology)**

**(40 Hours)**

Phlebotomy

CBC  
RBO Typing  
Cross Matching of blood

### **BAOTT-008: Course Outcomes (COs): Biochemistry & Haematology**

|            |                                                                                                                               |
|------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Explain Vitamins & Minerals: Fat soluble vitamins and Water soluble vitamins B complex vitamins principal elements.           |
| <b>CO2</b> | Explain Acids and bases: Definition pH, Henderson- Hassel Balch equation, Buffers, Indicators, Normality, Molarity, Molality. |
| <b>CO3</b> | Identify hemoglobin, blood cell counts, differential count.                                                                   |
| <b>CO4</b> | Describe the coagulation parameters like BT, CT.                                                                              |
| <b>CO5</b> | Understand blood transfusion-hazards and complications.                                                                       |
| <b>CO6</b> | Identify the cross Matching of blood technique.                                                                               |

### **BAOTT-009: Pathology & Microbiology (50+50 Hours) Learning Objectives Credit :4**

This course introduces students to the fundamentals of pathology, and microbiology. injury, inflammation, immunity disorders, infectious diseases, neoplasia, environmental and nutritional disorders, morphology and growth of microorganisms, culture media, sterilization and disinfection, immunology, systematic bacteriology, parasitology, mycology, and virology are among the topics covered.

#### **Pathology**

##### **Unit 1: Cellular adaptation, Cell injury & cell death 1.7 Hours**

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.

##### **Unit 2: Inflammation. -8 Hours**

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

- a) Immunity disorders. - 6 Hours

General features of the immune system Disorders of the immune system

- a) Infectious diseases. - 6 Hours

General principles of microbial pathogenesis viral infections.

Bacterial infections-Rheumatic heart disease.

Fungal infections.

Parasitic infections.

**Unit 3** Neoplasia. - 5 Hours

Definitions Nomenclature.

Biology of tumor growth benign and malignant neoplasms Epidemiology.

Carcinogenic agents and their cellular interactions Clinical features of tumors.

- a) Environmental and nutritional disorders.8 Hours

Environmental and disease.

Common environmental and occupational exposures Nutrition and disease.

Coronary artery disease.

**Clinical Microbiology**

**(50 Hours)**

**Unit 4:**Morphology 6 Hours

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

- a) Growth and nutrition.- 4 Hours

Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

- b) Culture media.- 4 Hours

Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.

- c) Sterilization and Disinfection.- 2 Hours

Principles and use of equipment of sterilization namely hot air oven, autoclave, and serum inspissator; pasteurization, antiseptic and disinfectants.

- d) Immunology. - 6 Hours

Immunity,vaccines,types of vaccine and immunizations schedule,principles, and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA.

Rapid tests for HIV and HBsAg (excluding technical details).

**Unit 5: Systematic Bacteriology. - 10 Hours**

Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure, and pathogenicity),

Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.

e) **Parasitology. - 6 Hours**

Morphology, life cycle, laboratory diagnosis of following parasites: E. histolytica, Plasmodium, tape worms, Intestinal nematodes.

f) **Mycology. - 6 Hours**

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi

g) **Virology. - 6 Hours**

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

**BAOTT-009: Course Outcomes (COs): Pathology & Microbiology**

|            |                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01</b> | Explain this course introduces students to the fundamentals of pathology, and microbiology. injury, inflammation, immunity disorders. |
| <b>C02</b> | Explain the cellular adaptation, Cell injury & cell death.                                                                            |
| <b>C03</b> | Identify the general features of inflammation Historical highlights                                                                   |
| <b>C04</b> | Illustrate the bacterial infections and rheumatic heart disease.                                                                      |
| <b>C05</b> | Describe the sterilization and disinfection techniques.                                                                               |
| <b>C06</b> | Memorize Immunity, vaccines, types of vaccine and immunization schedule.                                                              |

## Hours) Learning Objective

### Credit 2

This course provides an overview to pharmacology. It discusses several medication classes, their modes of action, indications, contraindications, adverse effects, and interactions

### Clinical pharmacology

#### Unit 1:

- a) Introduction to Pharmacology. 2 Hours
- b) Pharmacokinetic & Pharmacodynamics & routes of drugs administration - 3 Hours
- c) NSAIDs Drugs. -3 Hours
- d) Ant sialagogues: Atropine, Glycopyrrolate. - 4 Hours
- e) Sedatives / Anxiolytics: Diazepam, Phenergan, Lorazepam, Midazolam, an, am, Chlorpromazine, and Tricolours. - 4 Hours
- a) Narcotics: Morphine, Pethidine, Fentanyl, Pentazocine, tramadol 2 Hours
- b) Antiemetic's Metoclopramide, Ondansetron, Dexamethasone 2 Hours
- c) Induction Agent: Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate. - 4 Hours
- d) Muscle Relaxants: Depolarizing Suxamethonium Non depolarizing - Vecuronium, Atracurium, rocuronium. - 4 Hours
- e) Inhalational Gases: Gases-O<sub>2</sub>, N<sub>2</sub>O, Air, Agent Ether, Halothane, Isoflurane, Sevoflurane, Desflurane - 2 Hours
- f) Reversal Agents: Neostigmine, Glycopyrrolate, Atropine, Naloxone, Flumazenil (Diazepam). - 2 Hours
- g) Local Anesthetics: Xylocaine, Bupivacaine - Topical, Prilocaine-jelly, Emla- Ointment, Etidocaine. Ropivacaine 3 Hours

**Unit 2:**

Emergency Drugs : Mode of administration, dilution, dosage and effects  
- 12 Hours

Adrenaline, Atropine  
Ephedrine, Mephentermine  
Bicarbonate, calcium, potassium.  
Inotropes: dopamine, dobutamine, amiodarone  
Aminophylline, hydrocortisone, antihistaminic,  
Antihypertensive – Beta-blockers, Ca-channel blockers.  
Antiarrhythmic, xylorcard  
Vasodilators- nitroglycerin & sodium nitroprusside  
Respiratory system- Bronchodilators  
Renal system- Diuretics, furosemide, mannitol

**BAOTT-010: Course Outcomes (COs): Basic Concepts in Pharmacology**

|            |                                                                                      |
|------------|--------------------------------------------------------------------------------------|
| <b>CO1</b> | Generate the pharmacokinetic & Pharmacodynamics & routes of drugs administration.    |
| <b>CO2</b> | Explain the narcotics Morphine, Pethidine, Fentanyl, Pentazocine, tramadol.          |
| <b>CO3</b> | Identify the emergency Drugs : Mode of administration, dilution, dosage and effects. |
| <b>CO4</b> | Illustrate the Inotropes: dopamine, dobutamine, amiodarone.                          |
| <b>CO5</b> | Describe the local Anesthetics: Xylocaine, Bupivacaine etc.                          |
| <b>CO6</b> | Memorize the renal system Diuretics and furosemide, mannitol.                        |

**BAOTT-011 Basic computers and information Science, Communication, and soft skills.  
(40 Hours)****Learning Objectives****Credit: 4 (2+2)**

This course exposes students to computer technology, including topics such as computer organization, operating systems, software applications (MS Word, Excel, and PowerPoint), computer networks, internet applications, and computer use in healthcare settings. It also includes fundamental language and communication skills such as grammar, business communication, writing techniques, and oral presentations.

## Basic computers and information science

(24 Hours)

The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation. Topics to be covered under the subject are as follows:

### Unit 1:

- a) Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.
- b) Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems).

### Unit 2:

- c) Processor and memory: The Central Processing Unit (CPU), main memory.
- d) Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

### Unit 3:

- e) Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).
- f) Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

### Unit 4:

- g) Introduction to Excel: introduction about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.
- h) Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
- i) Introduction of Operating System: introduction, operating system concepts, types of operating system.

### Unit 5:

- j) Computer networks: introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.
- k) Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.
- l) Application of Computers in clinical settings.

### **Practical on fundamentals of computers**

**- 30 Hours**

Learning to use MS office: MS word, MS PowerPoint, MS Excel.

To install different software.

Data entry efficiency

#### **Practical Topics:**

This would involve hands-on training in computer systems and software applications. This includes learning about computer hardware components and their functions, input and output devices, processor and memory management, and storage devices.

Practical sessions can be conducted on operating systems such as MS Windows, with a focus on navigating the desktop, managing files and folders, and working with windows and shortcuts.

Students should also gain proficiency in using MS Word for document creation and formatting, MS Excel for data entry and manipulation, and MS PowerPoint for creating and delivering presentations.

Additionally, practical exercises on computer networks and internet applications, including email, file transfer, and web browsing, can be provided to enhance their understanding of computer usage in clinical settings.

### **Communication and soft skills**

Major topics to be covered under Communication course:

**- 16 Hours**

Basic Language Skills: Grammar and Usage. - 2 Hours

Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation. 2 Hours

Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization. 4 Hours

Basic concepts & principles of good communication- 2 Hours

Special characteristics of health communication- 2 Hours

Types & process of communication 2 Hours

Barriers of communication & how to overcome them 2 Hours

### **Practical in Communication & Soft Skills**

**– 30 Hours**

In terms of communication and soft skills, practical topics should aim to develop effective communication abilities for interacting with patients and healthcare professionals.

This can involve exercises in grammar and language skills, emphasizing business communication and spoken communication through conversations, discussions, and short presentations.

Practical sessions on various writing formats such as letters, emails, reports, and case studies should be included, focusing on proper organization and clarity.

Students should be taught the principles of good communication, including the special characteristics of health communication and strategies for overcoming communication barriers. Role-playing scenarios and simulated patient interactions can also be incorporated to enhance their communication skills in a healthcare context.

**BAOTT-011 Course Outcomes (COs): Basic computers and information Science, Communication, and soft skills.**

|            |                                                                                                                                                          |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Describe this course exposes students to computer technology, including topics such as computer organization, operating systems, software applications   |
| <b>CO2</b> | Explain the introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. |
| <b>CO3</b> | Identify the introduction to power-point: introduction, creating and manipulating presentation                                                           |
| <b>CO4</b> | Illustrate the introduction to power-point: introduction, creating and manipulating presentation                                                         |
| <b>CO5</b> | Describe the application of Computers in clinical settings.                                                                                              |
| <b>CO6</b> | Identify the barriers of communication & how to overcome                                                                                                 |

### Third Semester

**BAOTT-012 Basic techniques of Anaesthesia**  
**Hours) Learning Objectives**  
**5 (3+2)**

**(100**  
**Credit**

The learning objectives are designed to provide a thorough grasp of the significance

of preoperative assessment and patient preparation in assessing Anaesthesia risks and planning appropriate care. The design, components, and performance of the anaesthesia machine, safety systems, fluid management strategies, emergency drugs, anaesthetic induction and airway management procedures, and airway devices are all covered in this course. It also discusses the principles of balanced anaesthesia, the administration of inhalation and intravenous anaesthetics, vital sign monitoring techniques, depth of anaesthesia, and oxygenation.

The training also delves into pain management and analgesia techniques such as systemic analgesics, regional anaesthesia, and patient-controlled analgesia. It also discusses anaesthetic considerations for typical general surgical operations as well as challenges in obstetric and gynaecological surgery. The course outcomes include demonstrating proficiency in conducting preoperative assessments, operating the Anaesthesia machine effectively and safely, implementing safety systems, implementing appropriate perioperative fluid management strategies, registering and managing emergencies, performing anaesthetic induction and airway management, demonstrating knowledge of pre-medication, pre-oxygenation, induction agents, intubation and reversal agents, vaporizers, and demonstrating knowledge of vaporizers.

## Basics Techniques of Anesthesia

### Unit 1

- a) Preoperative assessment and patient preparation: Understanding the importance of preoperative evaluations, patient history, and physical examinations to assess Anaesthesia risks and plan appropriate care.  
- 10 Hours
- b) Anesthesia Machine: Design, Components, and Functionality 5 Hours
- c) Safety systems in Anesthesia machine. Flow systems, CO2 Absorbents, Circuit types, Humidification devices 5 Hours

### Unit 2:

- d) Perioperative Fluid Management: Strategies and Considerations. (Crystalloids and Colloids). 5 Hours
- e) Perioperative Emergency Medications: Indications, Administration, and Management – 5 Hours

### Unit 3:

- f) Anesthetic induction and airway management: Learning about various induction techniques, airway devices, and strategies for maintaining a patent airway during surgery. 10 Hours
- g) Brief Idea about Premedication, Pre oxygenation or denitrogenating, Induction and inducing agents, Sellick's manoeuvre, Vaporizers, Principles and types, Intubation, and reversal agents. - 10 Hours
- h) Maintenance of Anesthesia and monitoring: Understanding the principles of balanced Anaesthesia, administration of inhalation and

intravenous anaesthetics, and monitoring techniques for vital signs, depth of Anaesthesia, and oxygenation.

- 10 Hours

#### **Unit 4:**

- i) Pain management and analgesia: Exploring different methods of perioperative pain management, including systemic analgesics, regional Anaesthesia, and patient-controlled analgesia. 10 Hours
- j) Anesthetic considerations for common general surgical procedures: Studying the specific Anaesthesia considerations, techniques, and challenges associated with general surgical procedures like appendectomy, cholecystectomy, hernia repair, and laparotomy. 10 Hour

#### **Unit 5:**

- k) Anesthetic considerations for obstetric and gynaecological surgeries: Learning about the unique challenges and considerations for providing Anaesthesia during labor and delivery, caesarean section, gynaecological surgeries, and management of obstetric emergencies. - 10 Hours
- l) Management of Anesthesia-related complications: Understanding the recognition and management of potential complications and adverse events related to Anaesthesia, including cardiovascular, respiratory, and allergic reactions.

- 10 Hours

#### **Practical or Clinical posting topics:**

**(50 Hours)**

Preoperative assessment and patient preparation include performing simulated preoperative assessments such as history taking and physical tests.

Using patient features to stratify risk and make decisions for anesthesia treatment.

Anesthesia machine and safety systems: Familiarization with the components and functionality of an anesthesia machine through hands-on experience.

Regional anesthesia procedures: Training in various regional anesthesia techniques, such as peripheral nerve blocks and epidurals, using simulation.

Management of anesthesia-related complications

Simulation of anesthesia-related problems such as airway obstruction, hypotension, and allergy through role-playing.

### **BAOTT-012 Course Outcomes (COs): Basic Techniques of Anaesthesia**

|            |                                                                                                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01</b> | Explain the principles and processes <b>preoperative assessment and patient preparation</b> including evaluation of anaesthetic risks, history taking, and physical examination.          |
| <b>C02</b> | Describe the <b>structure, components, and safety features of anaesthesia machines and circuits</b> including flow systems, CO <sub>2</sub> absorbents, and humidification devices.       |
| <b>C03</b> | Demonstrate understanding of <b>perioperative management</b> including fluid and electrolyte balance, administration of emergency medications, and monitoring of vital parameters.        |
| <b>C04</b> | Apply knowledge of <b>anaesthetic induction, airway management, and maintenance of anaesthesia</b> , including the use of induction agents, vaporizers, and airway devices.               |
| <b>C05</b> | Discuss various <b>pain management and analgesic techniques</b> including systemic, regional, and patient-controlled methods for perioperative care.                                      |
| <b>C06</b> | Identify and manage <b>anaesthetic considerations and complications</b> associated with general, obstetric, and gynaecological surgeries, ensuring patient safety and effective recovery. |

**BAOTT-013 Basics of Surgical procedures**  
**Hours) Learning Objectives**  
**Credit 5 (3+2)**

**(100**

Understanding the operation theatre layout, WHO checklist, carbolization, and fumigation processes, as well as the concepts, indications, and techniques of typical general surgical procedures, are the learning objectives. They must also use aseptic technique and maintain a sterile field. Appendicitis, hernias, cholecystitis, gastrointestinal cancers, and peptic ulcer disease are among the diseases covered in the course, as are ectopic pregnancy, pelvic inflammatory disease, endometriosis, fibroids, ovarian cysts, and cervical and ovarian cancers.

The course outcomes included demonstrating understanding of the operation theatre layout, WHO checklist, carbolization, and fumigation procedures, effectively applying principles, indications, and techniques, identifying, and managing diseases in general surgical practice, managing diseases in obstetric/gynecologic practice, applying appropriate incision and wound closure techniques, recognizing and handling surgical instruments, and implementing site infection prevention and control. The learning objectives aim to provide a comprehensive understanding of general surgical procedures, obstetric/gynecologic procedures, and patient positioning requirements.

**Basics of Surgical Procedures**  
**Unit 1:**

Layout of Operation Theatre, WHO Checklist, Carbolization and Fumigation: - 10 Hours

Introduction to general surgical procedures: Understanding the principles, indications, and techniques of common general surgical procedures, such as appendectomy, cholecystectomy, and hernia repair. - 10 Hours

#### **Unit 2:**

Principles of aseptic technique and sterile field management: Spaulding's Classifications of zones. Learning the importance of maintaining a sterile environment in the operating room, including proper hand hygiene, gowning, gloving, and sterile draping technique. - 10 Hours

Diseases in General Surgical Practice: Appendicitis, Hernias, cholecystitis, Gastrointestinal (GI) Cancers, Peptic Ulcer Disease. - 10 Hours

Diseases in Obstetric/ Gynecologic Practice: Ectopic Pregnancy, Pelvic Inflammatory Disease (PID), Endometriosis, Fibroids, Ovarian Cysts, Cervical and Ovarian Cancer. - 10 Hours

Incision and wound closure techniques: Studying various surgical incision types, wound closure methods (such as sutures, staples, and adhesive tapes), and wound dressing principle. - 10 Hours

#### **Unit 3:**

Surgical instrument identification and handling: Familiarizing with surgical instruments commonly used in general surgery and obstetrics and gynecology, and understanding their functions, proper handling, and maintenance. - 10 Hours

Surgical site infection prevention and control: Exploring strategies and protocols to minimize the risk of surgical site infections, including preoperative skin preparation, antimicrobial prophylaxis, and aseptic practice. - 10 Hours

#### **Unit 4:**

Anesthesia considerations and patient positioning in general surgery: Understanding the specific anesthesia considerations and patient positioning requirements for general surgical procedures to optimize patient safety and surgical outcomes. - 10 Hours

Common general surgical procedures in obstetrics and gynecology: Studying the specific surgical procedures performed in obstetrics and gynecology, such as caesarean section, hysterectomy, and ovarian cystectomy, and their related considerations. - 10 Hours

#### **Practical / Clinical Postings topics:**

**(50 Hours)**

Operation Theatre Layout and WHO Checklist: A guided tour of an operating theatre, covering the layout, equipment organization, and separate zones (sterile and non-sterile).

Using the WHO Surgical Safety Checklist to demonstrate preoperative, intraoperative, and postoperative checklist components.

Suturing materials and suturing techniques will be demonstrated.

Scenarios were created to emphasize the need to keep a sterile area and

avoid contamination during surgical procedures. Gloving, Gowning and Draping Techniques.

Identification and uses of surgical instruments.

Anesthesia and patient positioning: Demonstration and practice of patient positioning techniques for general surgical operations, considering patient safety, accessibility, and the demands of the surgeon.

Simulations of communication and coordination between anesthesia providers and surgical team members during patient placement.

## BAOTT-013 Course Outcomes (COs): Basics of Surgical Procedures

|            |                                                                                                                                                                                                                                            |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Describe the <b>layout of the operation theatre</b> , WHO surgical safety checklist, and methods of <b>disinfection, carbolization and fumigation</b> essential for maintaining a sterile environment.                                     |
| <b>CO2</b> | Explain the <b>principles and techniques of common general surgical procedures</b> such as appendectomy, cholecystectomy, hernia repair, and other gastrointestinal surgeries.                                                             |
| <b>CO3</b> | Demonstrate understanding of <b>aseptic techniques, sterile field management, and Spaulding's classification of zones</b> ensuring infection-free surgical practices.                                                                      |
| <b>CO4</b> | Identify and handle <b>surgical instruments</b> used in general surgery and obstetrics–gynecology, and apply knowledge in <b>incision and wound closure techniques</b> for safe surgical assistance.                                       |
| <b>CO5</b> | Discuss the <b>anaesthetic considerations, patient positioning, and infection prevention measures</b> required during general and obstetric–gynecologic surgeries.                                                                         |
| <b>CO6</b> | Explain the <b>pathophysiology, indications, and surgical management</b> of common diseases encountered in general and obstetric/gynecologic surgical practice, including appendicitis, hernias, cholecystitis, PID, and uterine fibroids. |

## BAOTT-014 CSSD & Manifold Area

(50 Hours)

### Learning Objectives

Credit: 4

The Central Sterile Services Department (CSSD) is responsible for infection control as well as the provision of sterile tools and equipment. It entails a variety of sterilization techniques, decontamination processes, and instrument preparation and packaging techniques. In addition, the department oversees sterile storage and distribution which includes inventory control, first-in-first-out processes, and proper labeling and paperwork. Quality assurance and control procedures are put in place, such as monitoring sterilization processes and guaranteeing standard compliance. Hand hygiene, personal protective equipment use, aseptic procedures, and cross-contamination prevention are also addressed as infection control practices.

Procedures for equipment maintenance and troubleshooting are also provided.

Overall, the CSSD is critical to the safety and effectiveness of its operations.

### **CSSD Procedures Unit: 1**

- a. Introduction to Central Sterile Services Department (CSSD): Understanding the role and importance of CSSD in maintaining infection control and providing sterile instruments and equipment for surgical procedures. -3 Hours
- b. Sterilization methods: Exploring various sterilization methods used in CSSD, such as steam sterilization (autoclaving), ethylene oxide (ETO) sterilization, hydrogen peroxide plasma sterilization, and chemical sterilization. -10 Hours
- c. Decontamination processes: Learning about the decontamination procedures involved in CSSD, including manual cleaning, mechanical cleaning (using ultrasonic cleaners), and enzymatic cleaning. -4 Hours
- d. Instrument preparation and packaging: Understanding the proper techniques for instrument cleaning, inspection, assembly, and packaging to ensure their sterility and safe use in surgical procedures. -3 Hours
- e. Sterile storage and distribution: Studying the appropriate storage and distribution methods in CSSD, including maintaining proper inventory control, implementing first-in-first-out (FIFO) system, and ensuring proper labelling and documentation. -4 Hours
- f. Quality assurance and control: Exploring the quality assurance and control measures in CSSD, including biological and chemical monitoring of sterilization processes, documentation, and compliance with regulatory standards. -6 Hours
- g. Infection control practices: Understanding the principles of infection control in CSSD, including hand hygiene, personal protective equipment (PPE) usage, aseptic techniques, and prevention of cross-contamination. -4 Hours
- h. Equipment maintenance and troubleshooting: Learning about the maintenance and troubleshooting procedures for CSSD equipment, such as sterilizers, washers, and drying cabinets, to ensure their optimal performance. -3 Hours

### **Manifold: Unit 2:**

**(13 Hours)**

Introduction to Hospital Manifold Systems, Types of Medical Gases, Design and Layout of Manifold Systems, Gas Pressure Regulation and Control, Maintenance and Safety Practices, Gas Outlets and Connection Systems, Gas Identification and Labelling, Liquid Medical Oxygen,

Emergency Response and Gas Shutdown Procedures,

- 1. Troubleshooting and Problem-solving,
- 2. Regulations and Compliance.

## Practical Sessions for CSSD & Manifold Area:

(100

### Hours) CSSD Procedures:

60

#### Hours

##### Sterilization Methods:

Autoclave Operation: Students will learn how to operate an autoclave for steam sterilization.

Chemical Sterilization: Students will be introduced to chemical sterilization methods, such as using high-level disinfectants or low temperature sterilant.

##### Decontamination Processes:

Manual Cleaning Techniques: Students will practice manual cleaning techniques for decontaminating surgical instruments.

Ultrasonic Cleaner Operation: Students will operate an ultrasonic cleaner and learn about its role in mechanical cleaning.

##### Sterile Storage and Distribution:

Inventory Management: Students will learn how to maintain an organized inventory system in the CSSD.

#### Manifold Area:

(40 Hours)

##### Hospital Manifold Systems:

Manifold System Components: Students will explore the layout and components of a hospital manifold system.

They will learn about the gas sources, pressure regulation devices, alarms, and safety features present in the system.

Emergency Equipment Familiarization: Students will familiarize themselves with emergency equipment, such as gas shut-off valves, pressure relief devices, and emergency alarms.

##### Troubleshooting and Problem-Solving:

Manifold System Maintenance: Students will learn about common issues that can arise in the manifold system and practice troubleshooting techniques.

These practical sessions will provide students with hands-on experience, allowing them to apply their knowledge and develop essential skills related to CSSD procedures and manifold systems.

## BAOTT-014 Course Outcomes (COs): CSSD Procedures

|  |  |
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|--|--|

|            |                                                                                                                                                                                                                      |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01</b> | Explain the <b>organization, role, and functions of the Central Sterile Services Department (CSSD)</b> in ensuring infection control and maintaining sterile surgical supplies.                                      |
| <b>C02</b> | Describe various <b>sterilization and decontamination techniques</b> including steam, ethylene oxide (ETO), hydrogen peroxide plasma, and chemical sterilization, along with manual and mechanical cleaning methods. |
| <b>C03</b> | Demonstrate understanding of <b>instrument preparation, inspection, assembly, packaging, and sterilization cycles</b> to ensure safe and effective reuse in clinical settings.                                       |
| <b>C04</b> | Apply principles of <b>sterile storage, inventory management, and distribution</b> including labelling, documentation, and adherence to FIFO protocols.                                                              |
| <b>C05</b> | Explain <b>quality assurance and infection control practices</b> CSSD, including biological and chemical monitoring, use of PPE, aseptic techniques, and prevention of cross-contamination.                          |
| <b>C06</b> | Describe the <b>hospital manifold system</b> including types of medical gases, gas pressure regulation, safety measures, troubleshooting, and compliance with relevant standards and regulations.                    |

## **BAOTT-015 Industrial orientation and Industrial Visit** **Learning Objectives**

**(50 Hours)**  
**Credit: 2**

Understanding the types of industries relevant to the field, recognising the importance of industrial visits for practical exposure, planning and preparing for an industrial visit, gaining orientation to the industry, and actively observing and interacting with professionals are among the learning objectives for Operation Theatre and Anaesthesia Technology. Understanding the industry's organisational structure, departments, and functions, witnessing and engaging with professionals, displaying ethical conduct, and commenting on the experience are among the course outcomes. The final report or presentation summarises major takeaways, observations, and experiences from the industrial tour. The goal of the course is to provide practical insights and relevance to the curriculum as well as future professional growth.

### **Industrial orientation and Industrial Visit**

#### **Unit 1:**

- a. Introduction to industrial settings: Understanding the various types of industries relevant to the field of Operation Theatre and Anaesthesia Technology, such as medical device manufacturing companies, pharmaceutical companies, hospitals, and healthcare facilities.  
- 6 Hours
- b. Importance of industrial visits: Exploring the significance of industrial visits in gaining practical exposure, understanding real-world applications of theoretical knowledge, and observing professional work environments. 6

Hours

- c. Preparing for an industrial visit: Learning about the necessary preparations, including scheduling, logistics, and safety guidelines, for a successful and productive industrial visit.

- 6 Hours

- d. Orientation to the industry: Getting acquainted with the organizational structure, departments, and functions of the industry being visited, and understanding the roles and responsibilities of professionals working in that industry. - 6 Hours
- e. Observation and interaction: Actively observing the operations, processes, and workflows within the industry, and interacting with professionals to gain insights into their work, challenges, and best practices. 6 Hours

## Unit 2:

- f. Ethical considerations: Understanding ethical guidelines and professional conduct expected during the industrial visit, including respecting confidentiality, intellectual property, and workplace rules. 6 Hours
- g. Reflective learning: Reflecting on the industrial visit experience, consolidating observations, and discussing the practical implications and relevance of the visited industry to the field of Operation Theatre and Anaesthesia Technology. - 6 Hours
- h. Reporting and documentation: Summarizing the key learnings, experiences, and observations from the industrial visit in a comprehensive report or presentation, highlighting the relevance to the curriculum and future professional development. 8 Hrs.

## Course Outcomes (COs): Industrial orientation and Industrial Visit

CO1 Explain the various industrial settings related to Operation Theatre and Anaesthesia Technology, including medical device manufacturing units, pharmaceutical industries, hospitals, and healthcare facilities.

CO2 Recognize the significance of industrial visits in gaining practical exposure, understanding real-world applications of theoretical knowledge, and observing professional healthcare environments.

CO3 Demonstrate the ability to plan and prepare for industrial visits by understanding scheduling, logistics, safety protocols, and necessary documentation.

CO4 Describe the organizational structure, functions, and professional roles within the industries visited, and interpret workflow operations, and best practices through active observation and interaction.

CO5 Apply ethical and professional behaviour during industrial visits, maintaining confidentiality, respecting workplace norms, and adhering to intellectual property and safety guidelines.

CO6 Compile reflective observations and prepare a detailed report or presentation that summarizes key learnings, industry relevance, and implications for future professional development in OT and Anaesthesia Technology.

## Fourth Semester

### **BAOTT-016 Advanced Anesthesia Techniques** **Hours) Learning Objectives** **5 (3+2)**

**(100  
Credit**

The learning objectives cover various aspects of Anaesthesia, including ear, nose, and throat surgeries, airway management, ophthalmic surgeries, local and regional anaesthesia techniques, head and neck procedures, and complications specific to ENT and ophthalmic surgeries. Anaesthetic considerations for ear, nose, and throat surgeries include identifying challenges, understanding techniques for maintaining airway patency, evaluating risks and benefits, and developing strategies for pain and discomfort management. Advanced airway management techniques, such as fiberoptic intubation, supraglottic airway devices, and video laryngoscopy, are essential for securing and maintaining the airway during ENT procedures.

Ophthalmic surgeries involve unique considerations and challenges, with different techniques used for patient positioning, sedation, and monitoring. The advantages and disadvantages of different methods for specific ophthalmic procedures are also discussed. Local and regional anaesthesia techniques for head and neck procedures are also discussed, with the benefits, limitations, and potential complications of these techniques.

Complication management for ENT and ophthalmic surgeries involves recognizing potential complications, developing strategies for preventing and managing them, understanding the appropriate use of medications and interventions, and evaluating and implementing measures for optimizing patient safety and outcomes.

### **Course Outcome**

The course on Anaesthetic Considerations in ENT and Ophthalmic Surgeries aims to equip students with the skills to:

#### **Unit 1:**

- a) Anesthetic considerations for ear, nose, and throat surgeries: Demonstrate understanding of challenges and techniques involved in providing Anaesthesia for ENT procedures, apply appropriate methods and strategies for maintaining airway patency, and implement pain management protocols.
- b) Airway management in ENT procedures: Use advanced techniques like fiberoptic intubation, supraglottic airway devices, and video laryngoscopy to maintain airway patency and manage complications.

#### **Unit 2:**

- c) Anesthetic techniques for ophthalmic surgeries: Understand the unique challenges and challenges in providing Anaesthesia, apply appropriate techniques for different procedures, and implement patient positioning,

sedation, and monitoring protocols.

- d) Local and regional anesthesia techniques for head and neck procedures: Demonstrate proficiency in administering local anaesthetics and performing nerve blocks, and select and apply regional techniques based on surgical requirements.

### **Unit 3:**

- e) Management of complications specific to ENT and ophthalmic surgeries: Identify potential complications and adverse events, implement preventive measures, and address complications promptly and appropriately to ensure patient safety and optimize outcomes.

### **Advanced Anaesthesia Techniques (ENT and Ophthalmic Surgeries):**

#### **Unit 4:**

Anaesthetic considerations for ear, nose, and throat surgeries: Understanding the specific challenges and techniques involved in providing anaesthesia for ENT procedures such as tonsillectomy, adenoidectomy, and sinus surgery.

20 Hours

Airway management in ENT procedures: Learning about advanced airway management techniques, such as fiberoptic intubation, supraglottic airway devices, and video laryngoscopy, for securing the airway during ENT surgeries. - 20 Hours

#### **Unit 5:**

anaesthetic techniques for ophthalmic surgeries: Studying the unique considerations for providing anaesthesia during eye surgeries, including cataract extraction, retinal surgeries, and glaucoma procedures

20 Hours  
Local and regional Anaesthesia techniques for head and neck procedures: Exploring the principles and administration techniques for local anaesthetics, nerve blocks, and regional anaesthesia for head and neck surgeries. - 20 Hours

Management of complications specific to ENT and ophthalmic surgeries: Understanding the potential complications and adverse events related to Anaesthesia in ENT and ophthalmic surgeries and learning strategies for their prevention and management.

- 20 Hours

### **Practical Sessions:**

**(50 Hours)**

Considerations for Anesthesia in ENT Surgery:

Tonsillectomy and Adenoidectomy: Patient Positioning and Airway Access: During tonsillectomy and adenoidectomy operations, students will practice optimal patient positioning and techniques for preserving a patent airway.

Anesthetic Agent Selection and Administration Students will learn about the proper selection of anaesthetic agents for ENT operations, including inhalational and intravenous agents. They will put their administration and

monitoring skills to the test.

**Anesthetic Techniques for Sinus Surgery:** Students will learn about the anaesthetic considerations unique to sinus surgery, such as keeping a clear operative field, limiting bleeding, and managing patient placement. They will put these strategies to the test in simulated circumstances.

### **Airway Control in ENT Procedures:**

**Fibreoptic Intubation Techniques:** Students will practice fiberoptic intubation with airway manikins. They will learn how to use the fiberscope correctly to secure the airway in difficult ENT cases.

**Supraglottic Airway Devices: Insertion and Positioning of Supraglottic Airway Devices:** In simulated ENT settings, students will practice the insertion and correct positioning of supraglottic airway devices such as laryngeal mask airways (LMAs).

**Ophthalmic Surgery Anaesthesia Techniques:**

**Topical Anaesthesia Techniques for Cataract Extraction:** Students will learn and practice different topical anesthetic approaches for cataract extraction, such as eye drops, subconjunctival injections, and intracameral anaesthesia.

### **Retinal Surgery and Glaucoma Treatments:**

**Blocks for the peribulbar and retrobulbar areas:** Students will study and practice peribulbar and retrobulbar blocks, which are often used to provide anaesthesia during retinal and glaucoma treatments. On manikins, they will practice proper needle insertion and pharmaceutical deposition techniques.

### **Complication Management in ENT and Ophthalmic Surgery:**

**Difficult Airway Scenarios and Airway Obstruction:**

**Airway blockage Simulation:** Students will take part in simulated scenarios involving airway blockage and difficult airway circumstances in ENT surgery. They will practice effective management strategies such as emergency airway maneuvers and the placement of an alternate airway device.

### **Complications of Ophthalmic Surgery:**

**Ocular Emergencies Simulation:** During ophthalmic procedures, students will encounter simulated ocular emergencies such as rapid loss of vision or high intraocular pressure.

They will learn and practice the necessary emergency management strategies.

Students will be able to apply their theoretical knowledge in a simulated clinical setting during these practical sessions, allowing them to develop skills and confidence in managing anaesthetic considerations, airway management, and

complications specific to ENT and ophthalmic surgeries.

### **BAOTT-016 Course Outcomes (COs): Advanced Anesthesia Techniques**

|     |                                                                                                                                                                                                                         |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C01 | Demonstrate understanding of anaesthetic considerations and challenges specific to ear, nose, and throat (ENT) surgeries, and apply appropriate strategies to maintain airway patency and manage patient discomfort.    |
| C02 | Apply advanced airway management techniques—including fibre-optic intubation, supraglottic airway devices, and video laryngoscopy—in the context of ENT surgical procedures.                                            |
| C03 | Implement anaesthetic techniques tailored for ophthalmic surgeries—such as proper patient positioning, sedation, monitoring, and local/regional anaesthesia—while evaluating advantages and risks of different methods. |
| C04 | Demonstrate proficiency in administering local and regional anaesthesia for head and neck procedures, including nerve blocks, and select techniques based on surgical requirements and patient conditions.              |
| C05 | Identify potential complications associated with anaesthesia in ENT and ophthalmic surgeries, implement preventive measures, and respond appropriately and promptly to ensure patient safety and optimize outcomes.     |
| C06 | Integrate theoretical knowledge and practical skills in simulated and clinical settings to manage anaesthetic care in ENT and ophthalmic surgeries effectively, exhibiting professional competence and preparedness.    |

### **BAOTT-017 Advanced Surgical Procedures (100 Hours) Learning Objectives** **Credit 5 (3+2)**

The learning objectives for this course include understanding surgical procedures in ear, nose, and throat (ENT), diseases in otolaryngology (ENT), eye diseases, laser precautions, surgical techniques in ophthalmology, endoscopic procedures in ENT and ophthalmology, laser-assisted surgical procedures in ENT and ophthalmology, minimally invasive approaches in ENT and ophthalmology, and management of complications in ENT and ophthalmology.

The course covers various surgical procedures, diseases, and complications in ENT, ophthalmology, laser-assisted surgical procedures, minimally invasive approaches, and management of complications. Students will gain knowledge about the etiology, pathophysiology, clinical presentation, and diagnostic approaches for each ENT disease, as well as the medical and surgical treatment options available for managing ENT diseases.

The course also covers laser safety training, proper laser warnings signage, and

interlock systems. Students will also learn about the instruments and techniques involved in ophthalmic surgeries, as well as the preoperative, intraoperative and postoperative considerations for these procedures.

The course also covers endoscopic procedures, laser-assisted surgical procedures, and minimally invasive approaches in ENT and ophthalmology. Students will explore the advantages, limitations, and patient selection criteria for these approaches and evaluate the outcomes and potential complications.

In conclusion, this course provides a comprehensive understanding of surgical procedures, diseases, and complications in ENT and ophthalmology. By understanding these areas, students will be better equipped to manage and optimize patient outcomes during these procedures.

The course teaches students to demonstrate knowledge of surgical procedures in ear, nose, throat, and ophthalmology, apply specialized instruments and techniques, understand positioning requirements and diagnose common ENT diseases. It also covers medical and surgical treatment options, ophthalmic diseases, laser safety protocols, and ophthalmic surgical principles. Students will perform endoscopic procedures, safely and effectively utilize lasers, evaluate minimally invasive approaches, apply preventive measures, and optimize patient outcomes and safety in ENT and ophthalmic surgical interventions.

## **Advanced Surgical Procedures**

### **Unit 1:**

Surgical procedures in ear, nose, and throat (ENT): Learning about the various surgical procedures performed in ENT, including tonsillectomy, septoplasty, laryngectomy, and sinus surgery, and understanding the specialized instruments and techniques used, and positioning for each surgery. **15 Hours**

Diseases in Otolaryngology (ENT): Chronic Sinusitis, Tonsillitis, Deviated Septum, Otitis Media, Vocal Cord Nodules or Polyps, Obstructive Sleep Apnea (OSA), Laryngeal Cancer

, Nasal Polyps, Salivary Gland Disorders, Cochlear Implantation. **15 Hours**

### **Unit 2: Diseases in Ophthalmology: - 20 Hours**

Cataracts - Cataract Extraction and Intraocular Lens (IOL) Implantation,

Glaucoma - Trabeculectomy, Shunt Implantation, Laser Therapy

Age-related Macular Degeneration (AMD) - Intravitreal Injections, Laser Therapy, Photodynamic Therapy

Diabetic Retinopathy - Vitrectomy, Laser Therapy

Retinal Detachment - Retinal Detachment Repair

Dry Eye Syndrome - Punctal Occlusion Surgery

Conjunctivitis - Symptomatic Treatment (Medications, Eye Drops)

Corneal Diseases - Corneal Transplantation (Keratoplasty)

Refractive Errors - LASIK (Laser-Assisted in Situ Keratomileusis),

PRK (Photorefractive Keratectomy)

Retinoblastoma - Chemotherapy, Radiation Therapy, Enucleation (Eye Removal)

**Unit 3:**

Laser Precautions: Laser Safety Training, Protective Eyewear, Fire Safety Laser Plume Management, Patient Safety, Laser Device Maintenance, Laser Warning Signage, Laser Interlock Systems, Laser Hazard Assessment Compliance with Regulatory Standards.

- 6 Hours

Surgical techniques in ophthalmic surgery: Exploring the specific surgical procedures performed in ophthalmology, such as cataract extraction, corneal transplantation, vitrectomy, and refractive surgeries, and understanding the instrumentation and surgical principles involved 10 Hours

**Unit 4:**

Endoscopic procedures in ENT and ophthalmic surgery: Understanding the principles and techniques of endoscopic surgeries in ENT and ophthalmology, including endoscopic sinus surgery, laryngoscopy, tracheostomy, and arthroscopy. - 4 Hours

Laser-assisted surgical procedures in ENT and ophthalmology: Learning about the use of lasers in surgical procedures in ENT and ophthalmology, including laser-assisted tonsillectomy, laser-assisted stapedotomy, and laser refractive surgeries. - 10 Hours

Minimally invasive approaches in ENT and ophthalmic surgery: Exploring minimally invasive surgical techniques, such as laparoscopic and robotic-assisted procedures, in ENT and ophthalmology, and understanding their advantages and limitations. - 10 Hours

Management of complications in ENT and ophthalmic surgeries:

Understanding the potential complications and adverse events that may arise during ENT and ophthalmic surgeries, and learning strategies for prevention, recognition, and management 10 Hours

**Practicals:**

**(50 Hours)**

Surgical procedures in ear, nose, and throat (ENT) include tonsillectomy, septoplasty, sinus surgery, endoscopic sinus surgery, chronic sinusitis, tonsillitis, ophthalmic surgery, cataract extraction, corneal transplantation, and laryngoscopic examination. Students will know the identification of all surgical instruments of the above specialties.

Students will practice arrangement techniques for cold knife dissection, electrocautery, and coblation, as well as the proper use of specialized instruments like tonsil snares, dissectors, and hemostatic agents. They will also learn the principles of maintaining nasal airway patency and proper positioning of nasal packing.

Endoscopic sinus surgery involves hands-on experience with endoscopic

instruments, including sinus scopes and instrumentation.

Endoscopic procedures in ENT and ophthalmic surgery include simulated endoscopic sinus surgery scenarios using anatomical models, focusing on sinus visualization, polyp removal, and ostium widening. Students will also practice arranging instruments required for laryngoscopic examination using laryngoscope models, learning proper insertion and positioning of laryngoscope blades, visualization of vocal cords, and identification of laryngeal structures. These practical sessions provide students with hands-on experience and simulation-based training to develop skills and competence in advanced arrangement for surgical procedures, disease assessment, surgical techniques, and management of complications in ENT and ophthalmic surgeries.

### **BAOTT-017 Course Outcomes (COs): Advanced Surgical Procedures**

|     |                                                                                                                                                                                                                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Demonstrate knowledge of key surgical procedures and disease processes in ENT and ophthalmology – including anatomy, pathophysiology, clinical presentation, diagnostic methods, and both medical and surgical treatment options.                                                                          |
| CO2 | Apply specialised instrumentation, patient positioning, and surgical technique (including endoscopic, laser-assisted and minimally invasive methods) for ENT and ophthalmic surgeries in simulated and clinical settings.                                                                                  |
| CO3 | Implement appropriate anaesthesia, sedation, monitoring and safety protocols (including laser safety, interlock systems, protective eyewear, plume management) during ENT and ophthalmic surgical interventions.                                                                                           |
| CO4 | Perform local and regional anaesthesia techniques, nerve-blocks, and airway management (including fiberoptic intubation, supraglottic devices, video laryngoscopy) tailored for head & neck and ophthalmic surgeries.                                                                                      |
| CO5 | Identify, evaluate and manage intra-operative and post-operative complications specific to ENT and ophthalmic surgical procedures, using preventive, diagnostic and therapeutic strategies to optimise patient safety and outcomes.                                                                        |
| CO6 | Integrate theoretical knowledge and practical skills across ENT and ophthalmic domains to critically evaluate surgical approaches (conventional, endoscopic, laser-assisted, minimally invasive), select the best method for a given scenario, and enhance patient outcomes in multidisciplinary settings. |

### **BAOTT-018 Basic Intensive Care Learning Outcomes**

**150 Hour  
Credit 4 (2+2)**

- Recognize proper care and maintenance practices for ventilators, suction machines, and monitoring equipment.
- Check, clean, and troubleshoot this equipment on a regular basis.
- Recognize prevalent flaws and take corrective action.

- d) Understand the concepts of ventilator sterilization and disinfection.
- e) Recognize the proper sterilization processes and disinfectants for ventilators.
- f) Know how to care for, maintain, and operate beds, lights, and other pieces of equipment.
- g) Recognize the significance of air conditioning and pollution control in the ICU setting.
- h) Recognize HVAC systems and air filtration procedures in order to maintain air quality.
- i) Be familiar with the attachment and intraoperative use of ventilators and monitoring devices.
- j) Adult and pediatric patients who are unconscious are cared for
- k) Recognize unique care requirements, such as posture, hygiene, and monitoring.
- l) Recognize and manage any potential difficulties or crises that may arise while caring for unconscious patients.
- m) Become familiar with physiotherapy procedures, feeding, Ryle's tube insertion, and hyperalimentation.
- n) recognize suctioning and posture techniques in semiconscious and unconscious patients.
- o) Understand the concepts and procedures of oxygen therapy, including identifying and selecting appropriate delivery systems and masks based on patient needs.
- p) Assess ventilation during a patient emergency.
- q) Assist with ventilation using mouth-to-mouth, mouth-to-ET tube, or bag-valve mask construction procedures.
- r) Depending on the patient's condition and response, implement suitable ventilation methods.

### Course Outcomes

Students will leave with knowledge and abilities in ventilator care, maintenance and troubleshooting as well as basic sterilization and disinfection practices. It explains how to care for, maintain, and operate beds, lights, and other regularly used ICU equipment. Students will also learn to control air conditioning and pollution in the ICU environment, attach and configure ventilators and monitoring devices intraoperatively, provide appropriate care for unconscious adult and paediatric patients, perform physiotherapy techniques, suctioning, administer oxygen therapy, provide ventilator support, understand the principles of ventilator and monitoring equipment, measure blood pressure, temperature, and expired gases, and understand laryngeal anatomy.

#### Basic Intensive Care Unit 1:

Care and maintenance of ventilators, suction machine, monitoring devices.- 2 Hours  
 Sterilization and disinfection of ventilators.- 1 Hour  
 Care, maintenance and operational capabilities of beds, lights and other apparatus.

-1 Hour

Air conditioning and control of pollution in ICU Hour

Attachment and intraoperative utility of ventilators and monitoring devices. - 1 Hour

Care of unconscious adult and paediatric patients. - 3 Hour

Physiotherapy techniques, feeding, Byle's tube insertion and hyperalimentation.

-3 Hours

## Unit 2:

Suctioning and posturing of semiconscious and unconscious patients. 2 Hours

Oxygen therapy, maintenance of clear Airway, Various types of masks. 1 Hour

Ventilation of patient in crisis: 2 Hours

Resuscitator/ bag valve mask assembly - 2 Hours

Different types of Airways. 2 Hours

Short term ventilation/ Transport ventilators. 1 Hour

ABG techniques & analysis 3 Hours

## Unit 3:

Management of asepsis. - 4 Hours

Psychological aspects of the patient, relative and staff 2 Hours

Hemofiltration and hemodialysis: 4 Hours

Jet Ventilation.- 2 Hours

Ventilators: Principles of working of different ventilators 8 Hours

Volume cycled/ Time cycled/ Pressure cycled ventilators.

## Unit 4:

High frequency ventilators and other types.

Methods of measuring the expired gases from the patient; Types of spirometers, Principles of working of spirometers. Clinical application of above apparatus.

Apparatus and techniques of measuring of blood pressure and temperature; Principle and working of direct/indirect blood pressure monitoring apparatus; structure, principle and working of the Oscillo tonometer. Principles and working of aneroid manometer type B.P. instrument.

Laryngeal sprays; Types, material, principle, and mechanism.

Monitoring techniques and equipment; Cardiac monitors, Respiratory monitors, Spirometers, Temperature monitors.

## Practical/ Clinical Postings:

( 100 Hours)

Ventilator Care and Maintenance:

Hands-on practice in the proper care and maintenance of ventilators, including cleaning, sterilization, and disinfection techniques.

Understanding the functions and operation of different modes and settings of ventilators.

Troubleshooting common ventilator issues and alarm management.

Bed and Apparatus Care:

Practical demonstration of bed maintenance, including adjustment of height, positioning, and proper use of bed controls.

Familiarization with the operational capabilities of ICU lights and other apparatus, such as infusion pumps and monitors.

Cleaning and disinfection procedures for bed surfaces and equipment.

#### Air Conditioning and Pollution Control in ICU:

Practical session on the management of air conditioning systems in the ICU to maintain optimal temperature, humidity, and air quality.

Understanding the importance of infection control measures and strategies to minimize airborne contaminants in the ICU environment.

#### Care of Unconscious Patients:

Simulation-based training on the care and management of unconscious adult and pediatric patients, including monitoring vital signs, maintaining airway patency, and providing basic hygiene.

Practice in the proper positioning and turning techniques for unconscious patients to prevent pressure ulcers.

#### Oxygen Therapy and Airway Management:

Hands-on practice in administering oxygen therapy using different types of masks and nasal cannulas.

Simulation of airway management techniques, including insertion and securing of endotracheal tubes, use of different types of airways, and bag-valve mask ventilation.

#### Physiotherapy Techniques and Feeding Methods:

Practical demonstration and practice of physiotherapy techniques, such as chest physiotherapy and postural drainage, to promote airway clearance.

Training on safe and proper insertion of Ryle's tube for enteral feeding, followed by simulated feeding procedures and maintenance.

#### Hemofiltration and Hemodialysis:

Introduction to the principles and techniques of hemofiltration and hemodialysis for renal replacement therapy.

Simulation-based training on the setup and operation of hemofiltration and hemodialysis machines, including the monitoring of patients during the procedure.

#### Psychological Aspects of Patients, Relatives, and Staff:

Interactive sessions focusing on the psychological aspects of patients, their relatives, and healthcare staff in the ICU setting.

Role-playing exercises to develop effective communication skills and strategies for providing emotional support to patients and their families.

### **BAOTT-018 Course Outcomes (COs): Basic Intensive Care**

|     |                                                                                                                                                                                                      |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1 | Demonstrate the ability to perform routine checks, cleaning, sterilization/disinfection, and maintenance of ventilators, suction machines, monitoring devices, beds, lights and other ICU apparatus. |
| CO2 | Identify common equipment faults and malfunctions in ventilators and monitoring devices, and apply appropriate troubleshooting and corrective actions to ensure safe functioning.                    |
|     |                                                                                                                                                                                                      |

|     |                                                                                                                                                                                                                                                                   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO3 | Explain the principles and purpose of ICU environmental controls—such as air conditioning, HVAC systems, air filtration and pollution control—and their significance for infection prevention and patient safety.                                                 |
| CO4 | Provide comprehensive care for adult <del>and</del> pediatric unconscious or semi-conscious patients, including proper positioning, hygiene, suctioning, feeding (Ryle's tube), physiotherapy, hyperalimentation, airway maintenance and monitoring.              |
| CO5 | Apply oxygen therapy and emergency ventilation techniques (various masks, h valve-mask, ET tube ventilation, short-term/transport ventilators) in crisis situations, assessing ventilation adequacy and selecting appropriate methods based on patient condition. |
| CO6 | Interpret and manage monitoring data (blood pressure, temperature, expired gases, spirometry, ABGs) and understand relevant anatomical/physiological considerations (e.g., laryngeal anatomy) to support safe ICU care and patient outcomes.                      |

## BAOTT-019 Clinical Medicine & Related Management

(60 Hours)

### Learning Objectives

Credit :2

Practical topics for students in the field of respiratory and cardiovascular system include hands-on training in examinations and investigations, such as ECG interpretation and pulmonary function tests, as well as simulations for managing emergencies like cardiac arrest. They should also learn about specific conditions like ischemic heart disease, asthma, and pneumonia through case discussions and observation of relevant procedures. Additionally, practical sessions on airway management, chest tube insertion, and the use of diagnostic tools in diagnosing and managing lung diseases like tuberculosis and lung cancer are essential.

### Clinical Medicine & Related Management

#### Unit 1:

Respiratory & cardiovascular system- 4 Hours  
Examination and Investigations relevant to cardiovascular system- 4 Hours  
Ischemic heart disease 2 Hours  
Valvular heart diseases 4 Hours  
Common arrhythmias encountered in clinical practice- 2 Hours.  
Hypertension - 2 Hours  
Heart failure - 2 Hours  
Cardiomyopathies- 2 Hours

#### Unit 2:

Examination and Investigations relevant to respiratory system- 2 Hours  
Asthma and COPD- 4 Hours  
Pneumonia 2 Hours  
Pulmonary tuberculosis - 4 Hours  
Bronchiectasis- 2 Hours  
Lung abscess - 4 Hours  
Pneumothorax- 2 Hours  
Pleural effusion - 4 Hours  
Respiratory failure-types, causes and management- 6 Hours.  
Carcinoma lung - 6 Hours

### BAOTT-019 Course Outcomes (COs): Clinical Medicine & Related Management

|     |                                                                                                                                                                                                                                                                                       |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C01 | Demonstrate comprehensive knowledge of the aetiology, pathophysiology, clinical features, investigations and management of major cardiovascular disorders (including ischemic heart disease, valvular heart diseases, arrhythmias, hypertension, heart failure and cardiomyopathies). |
|     | Demonstrate comprehensive knowledge of the aetiology, pathophysiology                                                                                                                                                                                                                 |

|     |                                                                                                                                                                                                                                                                       |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C02 | clinical features, investigations and management of major respiratory disorders (including asthma & COPD, pneumonia, pulmonary tuberculosis, bronchiectasis, lung abscess, pneumothorax, pleural effusion, respiratory failure and lung carcinoma).                   |
| C04 | Formulate evidence-based diagnostic and therapeutic plans for patients with cardiovascular or respiratory disorders, including identification of complications and criteria for referral or advanced management.                                                      |
| C05 | Develop competence in emergency recognition and management strategies for cardiovascular and respiratory crises (e.g., arrhythmias, acute coronary syndromes, respiratory failure, pneumothorax, pleural effusion) and implement appropriate immediate interventions. |
| C06 | Integrate knowledge, clinical skills, and professional attitudes to deliver holistic patient care in cardiovascular and respiratory medicine, demonstrating effective communication, collaboration, patient education and life-long learning.                         |

## Fifth Semester

### BAOTT-020 Specialized Anaesthesia-1 Learning Objectives (3+2)

(100Hours)  
Credit 5

The learning goals span a wide range of anesthetic procedures, including orthopedic, pediatric, urological, regional, and regional anaesthesia. Comprehending special anaesthetic concerns and problems is required for orthopedic surgery, whereas comprehending distinct physiological and pharmacological aspects is required for paediatric anaesthesia. Exploring problems and considerations, understanding the influence of individual anomalies on anaesthetic management and perioperative care, and establishing strategies to optimize results and minimize risks are all part of anaesthetic management of patients with congenital anomalies. Understanding specialized anesthesia management procedures, such as prostatectomy, nephrectomy, and cystoscopy, as well as controlling probable problems and perioperative issues, are required for urological surgery. Regional anesthesia techniques for orthopedic and urological procedures entail learning pain management principles and techniques, performing peripheral nerve blocks and spinal anaesthesia, and comprehending indications, contraindications, and potential complications associated with regional anaesthesia.

Students will learn how to grasp anaesthetic considerations, techniques, and challenges in orthopedic surgeries, how to use appropriate techniques for paediatric patients, how to address congenital anomalies in paediatric patients, and how to use regional anaesthesia techniques for pain control. It also addresses potential problems and adverse events, provides safe and effective care, and exhibits expertise in monitoring techniques and management tactics. Students work with the

surgical team to improve patient outcomes, use evidence-based practices, and keep their knowledge and abilities up to date. The course also promotes a proactive approach to anaesthesia difficulties

### **Specialized Anaesthesia-1**

#### **Unit 1:**

- a) Anesthetic considerations for orthopedic surgeries: Studying the specific Anaesthesia considerations, techniques, and challenges associated with orthopedic procedures such as joint replacements, fracture fixation, and spine surgeries. - 20 Hours

#### **Unit 2:**

- b) Paediatric Anaesthesia techniques and considerations: Understanding the unique physiological and pharmacological considerations for providing Anaesthesia to paediatric patients, including preoperative preparation, induction, airway management, and pain management. - 20 Hours

#### **Unit 3:**

- c) Anaesthetic management of paediatric patients with congenital anomalies: Exploring the Anaesthesia challenges and considerations when managing paediatric patients with congenital anomalies undergoing surgical procedures. - 20 Hours

#### **Unit 4:**

- d) Anaesthesia for urological surgeries: Learning about the specific Anaesthesia considerations and techniques for urological procedures such as prostatectomy, nephrectomy, and cystoscopy. - 20 Hours

#### **Unit 5:**

- e) Regional Anesthesia techniques for orthopedic and urological procedures: Studying the principles and techniques of regional Anaesthesia, including peripheral nerve blocks and spinal Anaesthesia, for pain management during orthopedic and urological surgeries.

- 20 Hours

### **Practical Topics: Specialized Anaesthesia-1**

**(50**

#### **Hours) Orthopedic Surgery**

Simulation-based training on anaesthetic considerations and techniques for joint replacement surgeries, such as patient positioning, regional anaesthesia techniques, and intraoperative pain management.

Anesthetic treatment for fracture fixation procedures, including the use of various types of anaesthesia and monitoring measures, is demonstrated in practice.

Role-playing scenarios to better grasp the problems and decision-making involved in giving spinal anaesthesia

#### **Paediatric Surgery:**

Hands-on practice in pediatric airway care using suitable devices and techniques, such as mask ventilation, intubation, and supraglottic airway devices.

Simulation scenarios concentrating on the special issues for inducing and maintaining anaesthesia in paediatric patients, including as dose calculation, monitoring, and intraoperative care.

A hands-on session on juvenile pain management strategies, such as regional anaesthesia and multimodal analgesia.

Anaesthesia for Paediatric Patients with Congenital abnormalities: Interactive sessions addressing anesthetic problems and considerations when caring for children with congenital abnormalities.

Case studies and role-playing exercises are used to learn about preoperative evaluation, anaesthesia planning, and intraoperative care of unique congenital abnormalities.

Simulation of emergency situations and crisis management in paediatric patients with congenital abnormalities.

## **Urological surgeries**

Anaesthesia for Urological Surgeries: This course provides a practical demonstration of anaesthetic considerations and techniques for various urological surgeries such as prostatectomy, nephrectomy, and cystoscopy.

Training in urological surgery positioning and patient preparation, including the use of regional anaesthetic and intravenous sedation procedures.

Scenarios based on simulation to better understand intraoperative problems and management of fluid balance, hemodynamic, and pain control during urological procedures.

Techniques of Regional Anesthesia for Orthopedic and Urological Procedures: Practical experience with peripheral nerve blocks, including landmark recognition, needle insertion, and local anaesthetic administration.

Training in spinal anaesthetic procedures using simulation, including patient placement, sterile technique, and dose calculation.

## **Anaesthesia Considerations**

Case-based discussions on anesthesia considerations specific to orthopedic, Pediatric, and urological surgeries, focusing on patient assessment, anesthesia induction, and intraoperative monitoring.

Interactive sessions on pain management strategies for surgical patients in these specialties, including the use of regional anesthesia techniques, multimodal analgesia, and patient-controlled analgesia.

Simulation scenarios to practice crisis management during surgery, such as intraoperative bleeding, anaphylactic reactions, or airway emergencies.

## Postoperative Care and Rehabilitation:

Practical demonstration of postoperative care protocols for orthopedic, pediatric, and urological surgical patients, including wound care, monitoring vital signs, and early mobilization techniques.

Role-playing exercises to simulate patient education and discharge planning, including instructions on medication management, activity restrictions, and follow-up appointments.

Hands-on practice with rehabilitation exercises specific to orthopedic, pediatric, and urological surgical patients, focusing on maintaining joint mobility, strengthening, and functional recovery.

## BAOTT-020 Course Outcomes (COs): Specialized Anaesthesia-1

|            |                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Describe anaesthetic considerations and techniques for orthopaedic surgeries                         |
| <b>CO2</b> | Explain the physiological and pharmacological aspects of pediatric anaesthesia                       |
| <b>CO3</b> | Apply anaesthetic principles in managing pediatric patients with congenital anomalies during surgery |
| <b>CO4</b> | Demonstrate anaesthesia techniques and intraoperative care for various urological surgeries          |
| <b>CO5</b> | Analyse and perform regional anaesthesia techniques                                                  |
| <b>CO6</b> | Evaluate postoperative care, pain management, and rehabilitation strategies for surgical patients    |

## BAOTT-021: Specialized surgery 1 (100 Hours) Learning Objectives

Credit 5 (3+2)

The learning objectives cover various aspects of orthopedics, Pediatric surgery, urological diseases, and related surgeries. orthopedic diseases include osteoarthritis, fractures, herniated discs, scoliosis, and ligament injuries. Orthopedic surgical procedures include joint replacement, fracture fixation, spinal surgeries, and carpal tunnel release. Understanding the principles and techniques involved in surgical management of orthopedic conditions is crucial.

C-arm and radiation safety are also covered, including pregnancy and Paediatric radiology considerations, contrast media safety, infection control, equipment maintenance, calibration, patient identification and consent, emergency preparedness, and radiation dose optimization. Effective communication, documentation, quality assurance, and accreditation are also essential in the use of C-arm.

Paediatric surgical procedures include hernia repair, pyloromyotomy, congenital

anomaly correction, and laparoscopic surgeries. Specimens, techniques, and patient positioning are also discussed. Postoperative care protocols, pain management, and patient education are also covered.

Urological diseases and related surgeries include kidney stones, urinary tract infections, urinary incontinence, benign prostatic hyperplasia, bladder cancer, prostate cancer, erectile dysfunction, and vesicoureteral reflux. Understanding surgical treatment options and techniques for urological

diseases is essential. Anaesthesia considerations and specialized techniques are also discussed, along with the principles of postoperative care and rehabilitation specific to urological surgical patients.

The course is designed to give learners a thorough awareness of prevalent disorders in orthopedics, pediatric surgery, and urology, as well as suitable surgical procedures and techniques. Patient positioning, pain management, perioperative care, C-arm fluoroscopy, anaesthesia, postoperative care protocols, and rehabilitation programmes are all covered. Through continued professional development, students will also learn to effectively work with the surgical team, use evidence-based practices, and regularly update their knowledge and abilities in orthopedic, pediatric, and urological surgery.

### **Specialized surgery 1**

#### **a) Diseases in Orthopedics - 12 Hours**

##### **Unit 1:**

**Osteoarthritis:** Degenerative joint disease-causing joint pain and stiffness. Surgeries include joint replacement (e.g., total hip replacement, total knee replacement).

**Fractures:** Broken bones that require surgical intervention for realignment and stabilization. Surgeries may include open reduction and internal fixation (ORIF), external fixation, or intramedullary nailing.

**Herniated Disc:** Protrusion of intervertebral disc causing nerve compression. Surgical options include discectomy or spinal fusion.

**Scoliosis:** Abnormal curvature of the spine. Surgery may be performed in severe cases to correct the curvature, such as spinal fusion or insertion of spinal rods.

**Carpal Tunnel Syndrome:** Compression of the median nerve in the wrist. Surgical treatment involves carpal tunnel release to alleviate pressure on the nerve.

**Rotator Cuff Tears:** Tears in the tendons of the rotator cuff in the shoulder. Surgical repair or reconstruction may be required, such as arthroscopic rotator cuff repair.

**Ligament Injuries:** Injuries to ligaments, such as anterior cruciate ligament (ACL) tear in the knee. Surgical reconstruction may be performed using grafts, such as ACL reconstruction.

**Spinal Stenosis:** Narrowing of the spinal canal, causing compression of the spinal cord or nerves. Surgery options include laminectomy or spinal decompression to relieve pressure.

**Bone Tumors:** Abnormal growths in bones that may require surgical removal, such as tumor resection or limb-sparing surgeries.

**Osteoporosis:** Loss of bone density, leading to increased fracture risk. Surgical procedures may include vertebroplasty or kyphoplasty for spinal compression fractures.

**orthopedic surgical procedures:** Studying the specific orthopedic surgical procedures, including joint replacement surgeries (such as total knee replacement and total hip replacement), fracture fixation (fracture table), and spine surgeries, and understanding the instrumentation, implants, techniques involved and positioning for each surge

-20 Hours

**C-arm. Radiation Safety:** Pregnancy and Pediatric Radiology, Contrast Media Safety, Infection Control, Equipment Maintenance and Calibration, Patient Identification and Consent, Emergency Preparedness, Radiation Dose Optimization, Communication and Documentation, Quality Assurance and Accreditation.

-3 Hours

## **Unit 2:**

### **b) Diseases in Pediatric Surgery:- 15 Hours**

**Cleft Lip and Palate:** Facial birth defects involving the lip and/or palate. Surgical procedures are performed to repair and reconstruct the cleft lip and palate, typically in multiple stages.

**Pediatric Hernias:** Abnormal protrusions of organs or tissues through weak spots or openings in the abdominal wall, such as inguinal hernia or umbilical hernia. Surgical treatment involves hernia repair to close the defect.

**Pediatric Urological Conditions:** Disorders affecting the urinary system in children, such as hypospadias, cryptorchidism (undescended testicles), or vesicoureteral reflux (VUR), PUJO. Surgical interventions may include hypospadias repair, orchidopexy, or ureteral reimplantation.

**Pediatric Gastrointestinal Disorders:** Conditions like pyloric stenosis, malrotation or Hirschsprung's disease that affect the digestive system in infants and children. Surgical procedures are performed to correct the underlying issues, such as pyloromyotomy or bowel resection.

**Pediatric orthopedic Conditions:** Disorders involving the musculoskeletal system in children, such as clubfoot, developmental dysplasia of the hip (DDH), or scoliosis. Surgeries may include corrective procedures like clubfoot correction, hip reduction, or spinal fusion.

**Pediatric Neurosurgical Conditions:** Neurological disorders affecting children, such as hydrocephalus, spina bifida, or brain tumors. Surgical

interventions may involve shunt placement for hydrocephalus, repair of spina bifida defects, or tumor resection.

Pediatric Trauma: Surgical management of traumatic injuries in children, including fractures, burns, or lacerations. Surgeries aim to repair and stabilize the injured areas.

### Unit3:

- c) Paediatric surgical procedures: Exploring the surgical procedures performed in Paediatric surgery, such as Pediatric hernia repair, pyloromyotomy, congenital anomaly correction, and Paediatric laparoscopic surgeries, and understanding the specialized considerations, techniques for Paediatric patients and positioning for each surgery. - 15 Hours

### Unit4:

- d) Urological Diseases and Related Surgeries 20 Hours

Kidney Stones: Surgical procedures may include:

Extracorporeal Shock Wave Lithotripsy (ESWL): Non-invasive procedure that uses shock waves to breakdown kidney stones into smaller pieces, making them easier to pass.

Ureteroscopy with Laser Lithotripsy: Minimally invasive procedure where a thin tube is inserted into the ureter to remove or break down stones using a laser.

Urinary Tract Infections (UTIs): Surgeries are not typically required for UTIs. Treatment usually involves antibiotics to eliminate the infection.

Urinary Incontinence: Surgical options for urinary incontinence include:

Sling Procedures: Placement of a sling or mesh to support the urethra and prevent leakage of urine.

Bladder Neck Suspension: Surgical procedure to provide support to the bladder neck and urethra.

Artificial Urinary Sphincter: Placement of an artificial valve around the urethra to control urine flow.

Benign Prostatic Hyperplasia (BPH): Surgical procedures for BPH include:

Transurethral Resection of the Prostate (TURP): Removal of excess prostate tissue using a resectoscope inserted through the urethra.

Laser Surgery: Techniques like photo selective vaporization of the prostate (PVP) or holmium laser enucleation of the prostate (HoLEP) can be used to remove or vaporize prostate tissue.

Bladder Cancer: Surgical treatment options for bladder cancer include:

Transurethral Resection of Bladder Tumor (TURBT): Removal of bladder tumors using a resectoscope inserted through the urethra.

Radical Cystectomy: Surgical removal of the entire bladder, often followed by the creation of a urinary diversion.

Prostate Cancer: Surgical procedures for prostate cancer include:

Testicular Cancer: Surgical treatment for testicular cancer typically involves:

Radical Inguinal Orchiectomy: Surgical removal of the affected testicle through an incision in the groin area.

Erectile Dysfunction: Surgical options for erectile dysfunction include:

Penile Implants: Surgical insertion of inflatable or malleable implants to restore erectile function.

Vascular Surgery: Procedures to improve blood flow to the penis, such as arterial bypass surgery or penile venous ligation.

Vesicoureteral Reflux (VUR): Surgical options for VUR include:

Deflux Injection: Endoscopic procedure where a bulking agent is injected into the bladder wall to create a flap that prevents urine from flowing back into the ureters.

Ureteral Reimplantation: Surgical procedure to reposition the ureter and create a new valve mechanism to prevent reflux.

Renal Tumors: Surgical treatment for renal tumors may include:

Partial Nephrectomy: Removal of the tumor while preserving healthy kidney tissue.

Radical Nephrectomy: Surgical removal of the entire affected kidney.

## **Unit 5:**

### **Urological surgical procedures:**

Learning about urological surgical procedures, including nephrectomy, prostatectomy, urinary tract reconstruction, and cystectomy, and understanding the specific instrumentation techniques, considerations involved and positioning for each surgery.

Catheter types and sizes, Catheterization techniques, Different types of scopes used in Urology (Nephroscope, cystoscope, resectoscope, Ureteroscope).

Minimally invasive techniques in orthopedic, Pediatric, and urological surgery: Understanding the principles and techniques of minimally invasive approaches, including arthroscopy, laparoscopy, and robotic-assisted surgeries, in Orthopedics, Pediatric surgery, and urology.

- e) Anaesthesia considerations and specialized techniques in these surgical specialties: Gaining knowledge of the Anaesthesia considerations and specialized techniques required for orthopedic, Pediatric, and urological surgeries, including patient positioning, pain management, and perioperative care. -5 Hours
- f) Postoperative care and rehabilitation in orthopedic, Pediatric, and urological surgeries: Understanding the postoperative care protocols, rehabilitation techniques, and patient education specific to orthopedic, Pediatric, and urological surgical patients.

-5 Hours

### **Practical Topics - Specialized surgery 1**

**(50**

### **Hours) Orthopedic Surgeries**

Practical demonstration of surgical positioning techniques for different orthopedic procedures, such as joint replacement surgeries, fracture fixation, and spine surgeries.

Hands-on practice with orthopedic surgical instruments, implants, and techniques used in specific procedures like total knee replacement or fracture fixation.

Simulation-based training on postoperative care and rehabilitation exercises for orthopedic patients, including mobility assistance and range of motion exercises.

### **Pediatric Surgery:**

Practical session on sterile techniques and instrument handling specific to pediatric surgeries, such as cleft lip and palate repair or hernia repair in children.

Simulation scenarios focusing on the management of pediatric patients during different stages of surgery, including preoperative preparation, anesthesia induction, and intraoperative care.

Role-playing exercises to understand the unique considerations in postoperative care for pediatric surgical patients, including pain management and family support.

### **Urological Surgeries:**

Hands-on training on catheterization techniques, including different types of catheters and sizes used in urological procedures.

Practical demonstration of the use of various urological scopes, such as nephroscope, cystoscope, and ureteroscope, for diagnostic and surgical purposes.

Simulation-based scenarios to understand the perioperative management of urological surgical patients, including anesthesia considerations, positioning, and intraoperative complications.

### **Minimally Invasive Techniques:**

Practical session on arthroscopy techniques used in orthopedic surgeries, including joint examination, instrument handling, and diagnostic procedures.

Hands-on practice with laparoscopic instruments and techniques for pediatric and urological surgeries, including trocar insertion, camera navigation, and suturing.

Simulation-based training on robotic-assisted surgical procedures, such as robotic-assisted prostatectomy or pediatric robotic surgeries, to understand the robotic system setup and surgical techniques.

## **BAOTT-021 Course Outcomes (COs): Specialized surgery 1**

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| <b>C01</b> | Remember common diseases in orthopaedics, paediatrics, and urology.                          |
| <b>C02</b> | Explain surgical principles, instruments, and patient positioning.                           |
| <b>C03</b> | Describe minimally invasive techniques like arthroscopy, laparoscopy, and robotic surgery.   |
| <b>C04</b> | Apply surgical knowledge and patient handling skills in simulated settings.                  |
| <b>C05</b> | Demonstrate anaesthesia and perioperative care techniques for specialized surgeries.         |
| <b>C06</b> | Analyse postoperative care, pain control, and rehabilitation protocols for surgical patients |

**BAOTT-022 Recent Advancements in Anesthesia and Surgical Fields (100 Hours) Learning Objectives** Credit 5  
(3+2)

Recent advances in anaesthesia and surgical fields offer exciting opportunities for students to expand their knowledge and skills. By exploring topics such as minimally invasive surgery, enhanced recovery after surgery (ERAS), patient safety in the operating room, advances in anaesthetic techniques, and perioperative pain management, students can achieve specific outcomes. The first set of outcomes focuses on understanding and appreciating these advancements. Students will develop a clear understanding of the principles, advantages, and limitations of minimally invasive surgical techniques, as well as the concept and significance of ERAS in improving surgical outcomes. They will also recognize the importance of patient safety protocols and their application in the operating room.

In the second set of outcomes, students will delve into the details of recent advancements. They will acquire knowledge about specific topics such as advanced anaesthetic techniques, including total intravenous anaesthesia (TIVA) and target-controlled infusion (TCI). Students will explore the use of neuromuscular monitoring and understand its relevance in anaesthesia management. Furthermore, they will grasp the principles of multimodal analgesia and gain insights into regional anaesthetic techniques for effective pain management. These outcomes will equip students with up-to-date information and enhance their ability to analyze the impact of these advancements on patient outcomes and safety.

The final set of outcomes emphasizes the application of knowledge and skills in practice. Students will develop critical thinking abilities by evaluating the benefits and potential risks associated with recent advances in anaesthesia and surgical fields. They will also learn strategies for preventing surgical site infections and other complications, as well as strategies for optimizing patient preparation and postoperative care within an enhanced recovery framework. By achieving these outcomes, students will be well-prepared to contribute to the evolving healthcare landscape, ensuring the delivery of high-quality care while prioritizing patient safety.

and optimal outcomes.

Overall, these outcomes and learning objectives provide a comprehensive framework for B.OTT students to explore and understand recent advances in anaesthesia and surgical fields. By attaining these outcomes, students will be equipped with the necessary knowledge, skills, and mindset to adapt to the changing healthcare landscape and make a positive impact in their future professional practice.

### **Recent Advancements in Anesthesia and Surgical Fields**

#### **Unit 1:**

**Minimally Invasive Surgery:** Exploring the advancements in minimally invasive surgical techniques, such as laparoscopy, robotic surgery, and endoscopic procedures, and their benefits in terms of reduced trauma, faster recovery, and improved patient outcomes.

-15 Hours

**Enhanced Recovery After Surgery (ERAS):** Understanding the concept of ERAS protocols, which involve a multidisciplinary approach to optimize patient preparation, surgical techniques, anaesthesia management, and postoperative care, leading to shorter hospital stays, reduced complications, and enhanced recovery. - 15 Hours

#### **Unit 2:**

**Patient Safety in the Operating Room:** Discussing the importance of patient safety in the operating room and highlighting recent initiatives and technologies aimed at improving safety, such as surgical checklists, surgical site infection prevention measures, and the use of simulation training for healthcare professionals. - 15 Hours

**Advances in Anaesthetic Techniques:** Exploring recent developments in anaesthetic techniques, including total intravenous anaesthesia (TIVA), target-controlled infusion (TCI), BIS monitoring, CNAP monitoring and the use of neuromuscular monitoring to improved drug dosing and patient safety during anaesthesia. - 15 Hours

#### **Unit 3:**

**Perioperative Pain Management:** Discussing novel approaches and advancements in perioperative pain management, such as the use of multimodal analgesia techniques, regional anaesthesia, and the role of non-opioid analgesics in reducing opioid consumption and improving pain control.

- 10 Hours

#### **Unit 4:**

**Advances in Imaging Technology:** Exploring the use of advanced imaging

techniques, such as intraoperative ultrasound, 3D imaging, and image-guided navigation systems, in surgical planning, intraoperative decision-making and improved surgical accuracy.

- 10 Hours

#### **Unit 5:**

**Surgical Innovation and Emerging Technologies:** Discussing the latest trends and innovations in surgical techniques and technologies, including the use of 3D printing for surgical models and implants, virtual reality and augmented reality in surgical training and planning, and the potential of artificial intelligence in surgical robotics and decision support systems.

**Advances in Endoscopic Procedures:** Examining the latest developments in endoscopic procedures, such as single-incision laparoscopy, natural orifice transluminal endoscopic surgery (NOTES), and advanced endoscopic imaging modalities, and their impact on minimally invasive surgery and patient outcomes.

- 10  
Hours

### **BAOTT-022 Course Outcomes (COs): Recent Advancements in Anesthesia and Surgical Fields**

|            |                                                                                                 |
|------------|-------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Remember advancements in minimally invasive techniques.                                         |
| <b>CO2</b> | Explain ERAS protocols and patient safety measures used in modern surgical practice.            |
| <b>CO3</b> | Describe new anaesthetic techniques such as TIVA, TCI, and advanced patient monitoring systems. |
| <b>CO4</b> | Apply multimodal and regional anaesthesia methods for pain management                           |
| <b>CO5</b> | Utilise advanced imaging and navigation technologies for improved surgical precision.           |
| <b>CO6</b> | Analyse emerging surgical innovations like 3D printing, AI, and VR/AR applications in surgery.  |

### **BAOTT-023: Disaster Management & Environmental Science (60 Hours)** **Learning Objectives** **Credit 2**

Studying environmental sciences equips students with a deep understanding of ecological concepts, environmental issues, and scientific principles, while also fostering practical skills for data analysis, resource management, and environmental

assessment. By developing critical thinking, problem-solving abilities, and effective communication skills, students are empowered to address real-world environmental challenges, promote sustainability, and advocate for the protection of our planet. These outcomes enable students to make informed decisions, contribute to sustainable practices, and create positive change for the environment and future generations.

### **Unit 1: Disaster preparedness and management**

**(30 Hours)**

The objective of this section will be to provide knowledge on the principles of on-site disaster management. Concepts to be taught should include-

- Fundamentals of emergency management,
- Psychological impact management,
- Resource management,
- Preparedness and risk reduction,
- Key response functions (including public health, logistics and governance, recovery, rehabilitation, and reconstruction), information management, incident command and institutional mechanisms.

### **Unit 2: Environmental science**

**(30 Hours)**

- Water-safe water, reservoir
- Water pollution
- Water related diseases.
- Purification of water
- Composition of air
- Air pollution
- Environment protection act
- Noise pollution
- Radiation & Its hazards
- Housing and health
- Disposal of solid waste-solid, liquid & biochemical waste
- Disposal of liquid waste
- Disposal of biochemical waste
- Sanitation & general hygiene

## **BAOTT-023 Course Outcomes (COs): Disaster management & Environmental Sciences**

|            |                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------|
| <b>CO1</b> | Remember the basic principles and components of on-site disaster management.                       |
| <b>CO2</b> | Explain key elements of disaster preparedness, risk reduction, and resource management strategies. |
| <b>CO3</b> | Describe environmental components such as air, water, and waste management.                        |

|            |                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------|
| <b>C04</b> | Apply knowledge of sanitation, hygiene, and pollution control in healthcare.                                     |
| <b>C05</b> | Demonstrate understanding of institutional mechanisms and psychological impact management during disasters.      |
| <b>C06</b> | Analyse environmental hazards, waste disposal systems, and their implications for sustainable health and safety. |

## Sixth Semester

### **BAOTT-024 Specialized Anaesthesia-2** **Hours) Learning Objectives** **5 (3+2)**

**(100  
Credit**

The learning objectives include anaesthetic considerations for cardiovascular and thoracic surgery, as well as hemodynamic management strategies and monitoring approaches. They also cover central venous catheters, arterial line insertion, cardiac bypass and valve replacement procedures, controlling hemodynamic changes during cardiothoracic surgeries, and neurosurgery. To guarantee patient safety and ideal surgical conditions, the objectives also involve Neuro-Anesthesia procedures and monitoring, such as total intravenous anaesthesia (TIVA). Understanding the principles and methods of neurophysiological monitoring is essential for ensuring patient safety and optimal surgical circumstances.

The course aims to teach students about anaesthesia considerations for cardiovascular and thoracic surgeries, including hemodynamic management techniques and monitoring methods. It covers anaesthesia protocols for coronary artery bypass grafting, valve replacement and lung resection surgeries. Students will also demonstrate proficiency in selecting and inserting central venous catheters and applying infection control measures during insertion. They will also perform arterial line insertion with precision and safety, and assess collateral circulation using Allen's test.

The course also covers anaesthesia techniques for cardiac bypass and valve replacement procedures, managing cardiopulmonary bypass effectively during open-heart procedures, and ensuring stable hemodynamics throughout the procedure. Students will also manage hemodynamic changes during cardiothoracic surgeries, including hypotension and hypertension, using transesophageal echocardiography (TEE) for accurate hemodynamic monitoring.

The course also covers anaesthesia considerations for neurosurgical procedures, including patient positioning, intracranial pressure management, and neurophysiological monitoring. It also emphasizes patient safety during brain and spine surgeries. Neuro-anesthesia techniques and monitoring in neurosurgery include total intravenous Anaesthesia (TIVA) and neurophysiological monitoring.

methods to optimize surgical conditions and patient outcomes.

## **Specialized Anaesthesia-2**

### **Unit 1:**

Anesthetic considerations for cardiovascular and thoracic surgeries: Understanding the specific anaesthesia considerations, hemodynamic management, and monitoring techniques for cardiac and thoracic surgeries such as coronary artery bypass grafting, valve replacement and lung resection. 15 Hours

### **Unit 2:**

Central Venous catheter and various insertion techniques (IJV, Femoral, PICC and subclavian) 6 Hours

Arterial Line insertion and various techniques (including Allen's test) - 4 Hours

### **Unit 3:**

Anesthesia techniques for cardiac bypass and valve replacement procedures: Learning about the specific anaesthetic protocols, cardiopulmonary bypass management, and strategies for maintaining stable hemodynamic during open-heart surgeries.

- 15 Hours

Management of hemodynamic changes during cardiothoracic surgeries: Exploring the principles and techniques for managing hemodynamic changes, such as hypotension and hypertension, during cardiothoracic surgeries and TEE.- 20 Hours

### **Unit 4:**

Anaesthetic considerations for neurosurgical procedures: Understanding the unique challenges and considerations in providing anaesthesia for brain and spine surgeries, including patient positioning, intracranial pressure management & neurophysiological monitoring 20 Hours

### **Unit 5:**

Neuro-Anesthesia techniques and monitoring in neurosurgery: Learning about the specific anaesthetic techniques, such as total intravenous anaesthesia (TIVA) and neurophysiological monitoring, used in neurosurgical procedures to ensure patient safety and optimal surgical conditions.-20 Hours

## **Practical- Specialized Anaesthesia-2:**

**(50 Hours)**

Cardiovascular and Thoracic Surgeries: Simulation-based training on

hemodynamic monitoring techniques for cardiovascular and thoracic surgeries, such as non-invasive blood pressure measurement, pulse oximetry, and capnography.

Techniques for Inserting a Central Venous Catheter: Hands-on practice with simulation models or manikins to learn the many techniques for inserting a central venous catheter, including the internal jugular vein (IJV), femoral vein, peripherally inserted central catheter (PICC), and subclavian vein.

Arterial Line Insertion and skills: A hands-on session with simulation models or manikins to explore the stages needed and practice aseptic skills.

Cardiac Bypass and Valve Replacement Anaesthesia Techniques

Case studies and video presentations illustrate the anaesthesia techniques and considerations unique to cardiac bypass and valve replacement procedures.

Scenarios concentrate on the management of hemodynamic changes after cardiac procedures, such as preserving cardiopulmonary stability and dealing with probable consequences.

During cardiac bypass procedures, role-playing exercises are used to simulate communication and cooperation among the anesthesia team, perfusionists, and surgeons.

Management of Hemodynamic Changes During Cardiothoracic Surgery: Interactive sessions and case discussions on the management of typical hemodynamic changes observed during cardiothoracic surgery, such as hypotension, hypertension, and volume status optimization.

Simulation-based training in the use of non-invasive approaches to monitor hemodynamic parameters like stroke volume variation (SVV) or pulse pressure variation (PPV) to assist fluid management.

Simulation scenarios concentrating on intracranial pressure management and cerebral ischemia prevention during neurosurgery procedures.

Neuro-anesthesia Techniques and Monitoring in Neurosurgery: A hands-on seminar on the principles and techniques of total intravenous anaesthesia (TIVA) for neurosurgical procedures, including the use of TCI pumps.

### **BAOTT-024 Course Outcomes (COs): Specialized Anaesthesia-2**

|            |                                                                                                                                                                                     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1</b> | <i>Explain</i> the principles of anesthesia management for cardiovascular and thoracic surgeries, including coronary artery bypass grafting, valve replacement, and lung resection. |
| <b>CO2</b> | <i>Demonstrate</i> the techniques for central venous catheter insertion (IJV, femoral, PICC, subclavian) and arterial line placement with appropriate safety protocols.             |
| <b>CO3</b> |                                                                                                                                                                                     |

|            |                                                                                                                                                                                                                                                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | <i>Analyze</i> the hemodynamic variations and physiological changes occurring during cardiothoracic surgeries, and <i>interpret</i> intraoperative monitoring data such as arterial pressure and TEE findings.                                                                                                                                                      |
| <b>CO4</b> | <i>Integrate</i> anesthetic techniques and cardiopulmonary bypass management strategies to <i>maintain</i> stable hemodynamics during open-heart surgeries.                                                                                                                                                                                                         |
| <b>CO5</b> | <i>Evaluate</i> different approaches for managing intraoperative hemodynamic instability, including pharmacologic and mechanical interventions.                                                                                                                                                                                                                     |
| <b>CO6</b> | <i>Discuss and implement</i> the anesthetic considerations specific to neurosurgical procedures, focusing on intracranial pressure control, patient positioning, and neurophysiological monitoring and neuro-anesthesia techniques such as Total Intravenous Anesthesia (TIVA) and intraoperative neuromonitoring to optimize surgical outcomes and patient safety. |

**BAOTT-025: Specialized Surgery-2**  
**Hours) Learning Objectives**  
**Credit 5 (3+2)**

**(100**

The learning objectives include understanding common diseases in cardiovascular and thoracic surgery, such as coronary artery disease, valvular heart disease, aortic aneurysm, congenital heart defects, arrhythmias, lung cancer, peripheral artery disease, and deep vein thrombosis, and their surgical interventions. Recognizing congenital heart defects and their anatomical and physiological implications, understanding surgical options and techniques for repairing or reconstructing congenital heart defects, understanding different cardiac and thoracic surgical procedures, and understanding specific neurosurgical procedures. Anaesthetic considerations and techniques for CTVS and neurosurgery are also discussed, along with appropriate monitoring techniques and management strategies. Intraoperative monitoring modalities, such as ECG, arterial pressure monitoring, TEE, and neurophysiological monitoring are also discussed, with skills in interpreting data for optimizing patient outcomes. Perioperative management of complications is also discussed, identifying potential complications and adverse events, and acquiring strategies for preventing, recognizing, and managing them to ensure patient safety and positive surgical outcomes.

The course aims to teach students the pathophysiology of major disorders in cardiovascular and thoracic surgery, as well as congenital heart problems. Students will also learn about CTVS procedures such as CABG, valve replacement, lung resection, and thoracotomy as well as how to use specialized techniques for safe and effective surgeries. They will also study neurosurgical operations such as craniotomy, spinal fusion, tumor removal, and deep brain stimulation as well as patient placement and instrumentation. Anaesthetic concerns and approaches for CTVS and neurosurgery, as well as suitable monitoring techniques and management strategies for preserving hemodynamic stability, fluid balance, and neurophysiological monitoring, will be covered. To improve patient outcomes, intraoperative monitoring modalities such as ECG, arterial pressure monitoring, TEE, and neurophysiological monitoring will be used. Complication care during surgery will be critical, including recognizing and managing potential complications and adverse events, as well as adopting preventive initiatives to maintain patient safety and excellent surgical results.

## **Specialized Surgery-2**

### **Unit 1:**

#### **a) Diseases in CTVS: - 25 Hours**

**Coronary Artery Disease:** Narrowing or blockage of the coronary arteries supplying blood to the heart. Surgeries include:

**Coronary Artery Bypass Grafting (CABG):** Surgical procedure to bypass the blocked or narrowed coronary arteries using grafts from other blood vessels.

**Percutaneous Coronary Intervention (PCI):** Minimally invasive procedure to open blocked coronary arteries using balloon angioplasty and stent placement.

**Valvular Heart Disease:** Dysfunction or damage to the heart valves.

Surgeries may include:

**Valve Repair:** Restoration of the valve structure and function through surgical techniques.

**Valve Replacement:** Surgical removal of the damaged valve and implantation of a prosthetic valve.

**Aortic Aneurysm:** Abnormal enlargement of the aorta, the main blood vessel supplying blood to the body. Surgeries include:

**Aneurysm Repair:** Surgical repair of the weakened or enlarged section of the aorta, often through open surgery or endovascular stent grafting.

**Congenital Heart Defects:** Structural abnormalities in the heart present at birth. Surgeries depend on the specific defect and may include:

**Cardiac Defect Repair:** Surgical correction of congenital heart defects, such as atrial septal defect (ASD), ventricular septal defect (VSD), or Tetralogy of Fallot.

**Arrhythmias:** Abnormal heart rhythms. Surgeries may include:

**Pacemaker Implantation:** Surgical placement of a device that helps regulate the heart's electrical activity.

Ablation Procedures: Minimally invasive techniques to destroy or isolate abnormal electrical pathways in the heart.

Lung Cancer: Malignant tumors in the lungs. Surgeries for lung cancer include:

Lobectomy: Surgical removal of a lobe of the lung.

Pneumonectomy: Surgical removal of an entire lung.

Wedge Resection: Surgical removal of a small, localized portion of the lung.

Peripheral Artery Disease (PAD): Narrowing or blockage of arteries outside the heart, typically in the legs. Surgeries may include:

Peripheral Artery Bypass: Surgical creation of a bypass using a graft to restore blood flow to the affected area.

Angioplasty and Stenting: Minimally invasive procedures to open blocked arteries and place stents to maintain blood flow.

Deep Vein Thrombosis (DVT): Formation of blood clots in deep veins, commonly in the legs. Surgeries may involve:

Thrombectomy: Surgical removal of the blood clot from the affected vein.

Vein Bypass: Surgical creation of a bypass using a graft to redirect blood flow around the blocked vein.

## **Unit 2:**

- b) Congenital Heart Defects: Structural abnormalities in the heart present at birth, such as atrial septal defect (ASD), ventricular septal defect (VSD), or Tetralogy of Fallot. Surgeries include heart repair or reconstruction, such as ASD/VSD closure or open-heart surgery. - 10 Hours.

## **Unit 3:**

- c) Cardiovascular and thoracic surgical procedures (CTVS): Learning about the various cardiac and thoracic surgical procedures, including coronary artery bypass grafting (CABG), valve replacement, lung resection, and thoracotomy, and understanding the specialized equipment, techniques, and considerations in CTVS. - 15 Hours

## **Unit 4:**

- d) Neurosurgical procedures: Exploring the specific neurosurgical procedures, such as craniotomy, spinal fusion, tumor resection, and deep brain stimulation, and understanding the principles, instrumentation, and patient positioning requirements in neurosurgery (Placement of horseshoe, Cranial pins and Stereotactic devices). - 15 Hours

## **Unit 5:**

- e) Anesthetic considerations and techniques for CTVS and neurosurgery: Understanding the unique anesthesia considerations, monitoring techniques, and management strategies for patients undergoing CTVS and neurosurgical procedures, including hemodynamic stability, fluid management, and neurophysiological monitoring. 15 Hours

f) Intraoperative monitoring in CTVS and neurosurgery: Learning about the various intraoperative monitoring modalities used in CTVS and neurosurgery, such as electrocardiography (ECG), arterial pressure monitoring, transesophageal echocardiography (TEE), and neurophysiological monitoring, and their interpretation. - 10 Hours

g) Perioperative management of complications in CTVS and neurosurgical procedures: Understanding the potential complications and adverse events that may occur during CTVS and neurosurgical procedures, and learning strategies for their prevention, early recognition, and appropriate management. - 10 Hours  
[Practicals- Specialized Surgery-2: \(50 Hours\)](#)

**a) Cardiovascular and Thoracic Surgical Procedures (CTVS):**

Demonstration and hands-on practice of setting up and familiarizing with specialized equipment used in CTVS, such as heart-lung machines, cardiopulmonary bypass circuits, and intraoperative monitoring devices.

Simulation-based training on patient positioning and draping techniques for different CTVS procedures, including CABG, valve replacement, and lung resection.

Role-playing exercises to simulate communication and coordination among the surgical team, including anesthesiologists, surgeons, perfusionists, and nurses during CTVS procedures.

**b) Neurosurgical Procedures:**

Practical session on the instrumentation used in neurosurgical procedures, including the placement of horseshoe headrests, cranial pins, and stereotactic devices.

Hands-on practice with simulation models or manikins to understand the principles of patient positioning and draping for different neurosurgical procedures, such as craniotomy and spinal fusion.

Interactive discussions on the role of different instruments and equipment used in neurosurgery, including microscopes, drill systems, and neuro-endoscopes.

Anesthetic Considerations and Techniques for CTVS and Neurosurgery:

Case-based discussions and interactive sessions on the unique anesthesia considerations for CTVS and neurosurgical procedures, such as preoperative assessment, airway management, and selection of anesthetic agents.

Simulation scenarios to practice anesthetic techniques specific to CTVS and neurosurgery, including induction and maintenance of anesthesia, hemodynamic management, and optimization of cerebral perfusion.

Role-playing exercises to simulate communication and coordination between the anesthesia team and surgical team during CTVS and

neurosurgical cases.

**c) Intraoperative Monitoring in CTVS and Neurosurgery:**

Practical training on the setup and interpretation of various intraoperative monitoring modalities used in CTVS and neurosurgery, such as ECG, arterial pressure monitoring, TEE, and neurophysiological monitoring.

Case discussions and interactive sessions on the significance of intraoperative monitoring data and its role in decision-making during CTVS and neurosurgical procedures.

Hands-on practice with simulation models or manikins to understand the proper placement and troubleshooting of monitoring devices commonly used in CTVS and neurosurgery.

**Perioperative Management of Complications in CTVS and Neurosurgical Procedures:**

Interactive sessions and case discussions on the potential complications and adverse events that may arise during CTVS and neurosurgical procedures, focusing on prevention, early recognition, and appropriate management strategies.

Simulation-based training on managing hemodynamic instability, intraoperative bleeding, and neurologic complications in a simulated environment.

Role-playing exercises to practice effective communication, teamwork, and crisis management skills during perioperative complications in CTVS and neurosurgery.

**BAOTT-025 Course Outcomes (COs): Specialized Surgery -2**

|             |                                                                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO1:</b> | Describe the pathophysiology, clinical features, and surgical management of major cardiovascular and thoracic diseases such as coronary artery disease, valvular heart disease, aortic aneurysm, and peripheral vascular disease. |
| <b>CO2:</b> | Explain the principles, indications, and techniques involved in the surgical correction of congenital heart defects such as ASD, VSD, and Tetralogy of Fallot.                                                                    |
| <b>CO3:</b> | Differentiate and illustrate the various cardiovascular and thoracic surgical procedures including CABG, valve replacement, lung resection, and thoracotomy along with specialized instruments and equipment used.                |
| <b>CO4:</b> | Analyze common neurosurgical procedures such as craniotomy, spinal fusion and tumor resection, and demonstrate knowledge of positioning, instrumentation, and stereotactic devices used.                                          |
| <b>CO5:</b> | Apply anaesthetic considerations, monitoring techniques, and management strategies to ensure hemodynamic stability and patient safety during CTVS and neurosurgical procedures.                                                   |
|             |                                                                                                                                                                                                                                   |

|             |                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CO6:</b> | Evaluate intraoperative monitoring data and perioperative complications in orthopedic and neurosurgery, and formulate appropriate interventions for prevention and management. |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## BAOTT-026 Specialized Anaesthesia & Surgery 3

(100 Hours)

### Learning Objectives

Credit 5 (3+2)

The course aims to provide students with a comprehensive understanding of robotic-assisted surgical procedures, anesthetic considerations and techniques, and the role of operating theatre (OT) and Anaesthesia team (AT) professionals in assisting these procedures. It also covers the use of BIS, NMT, ultrasound, and navigation systems in anaesthesia practice, their applications, principles, and interpretation in patient monitoring and procedural guidance.

The course also covers the role of NORA (Non-Operative Room Anaesthesia) in modern anaesthesia practice, including radiation safety, sedation techniques, paediatric NORA, regional anaesthesia in non-operating room settings, critical care anaesthesia outside the ICU, safety and patient selection, teamwork and communication, equipment and resources, quality improvement, and patient outcomes.

The course also covers organ transplantation procedures, including kidney, liver and heart transplants, and their perioperative management, immunosuppression strategies, and ethical considerations. Students will learn about preoperative assessment and optimization processes for transplant recipients, as well as the multidisciplinary approach to preoperative management.

Postoperative care and immunosuppression in transplant surgeries will be identified, including immunosuppressive drug regimens, infection prevention strategies, and long-term follow-up care. Students will demonstrate understanding of the unique challenges and considerations in postoperative management of transplant recipients.

### Course Outcomes

Upon completion of the course, students will be able to:

Demonstrate knowledge and understanding of robotic-assisted surgical procedures, collaborate effectively in OT team, apply appropriate anaesthesia considerations and techniques, ensure patient safety, comfort, and optimal surgical conditions during robotic procedures.

By completing the course, students will be able to effectively collaborate in OT team, apply appropriate anaesthesia considerations and techniques, and effectively manage transplant recipients' postoperative care and immunosuppression.

## **Specialized Surgery-2**

### **Unit 1:**

- a) Robotic-assisted surgical procedures: Learning about the principles and techniques of robotic-assisted surgeries, such as robotic-assisted prostatectomy, robotic-assisted hysterectomy and robotic-assisted colorectal surgeries, and understanding the roles and responsibilities of the OT and AT professionals in assisting these procedures. - 4 Hours
- b) Anaesthetic considerations and techniques for robotic surgeries: Understanding the Anaesthesia considerations specific to robotic-assisted surgeries, including patient positioning, pneumoperitoneum management, and anesthetic agents and techniques suitable for these procedures. - 3 Hours
- c) BIS, NMT, Ultrasound, Navigation: 2 Hours

### **Unit 2:**

- d) NORA (Non-Operative Room Anesthesia) is a field within anesthesia that focuses on providing anesthesia services outside the traditional operating room setting. Here are some potential topics related to NORA: 6 Hours
  - Introduction to NORA: Overview of Non-Operative Room Anesthesia, its scope, and its role in modern anesthesia practice.
  - Procedures in Non-Operative Settings: Anesthetic management for various procedures performed outside the operating room, such as interventional radiology, endoscopy, cardiac catheterization, and bronchoscopy.
  - Radiation Safety: Pregnancy and Pediatric Radiology, Contrast Media Safety, Infection Control, Equipment Maintenance and Calibration, Patient Identification and Consent, Emergency Preparedness, Radiation Dose Optimization, Communication and Documentation, Quality Assurance and Accreditation.
  - Sedation Techniques: Techniques and protocols for sedation in non-operating room settings, including patient assessment, drug selection, monitoring, and managing complications.
  - Pediatric NORA: Special considerations and techniques for providing anesthesia to pediatric patients in non-operating room settings, including sedation for imaging studies, dental procedures, and emergency department interventions.
  - Regional Anesthesia in NORA: The use of regional anesthesia techniques, such as nerve blocks and epidurals, in non-operating room settings for pain management and surgical procedures.
  - Critical Care Anesthesia Outside the ICU: Anesthetic management and monitoring of critically ill patients in non-operating room locations, such as the emergency department, radiology suite, or cardiac catheterization lab.
  - Safety and Patient Selection: Strategies for patient selection, risk

assessment, and ensuring patient safety during NORA procedures, including pre-procedure evaluation, informed consent, and appropriate monitoring.

**Teamwork and Communication:** Effective collaboration and communication among anesthesia providers, proceduralists, and other healthcare professionals involved in NORA to optimize patient care and outcomes.

**Equipment and Resources:** Considerations for equipment, resources, and infrastructure needed to provide safe and efficient anesthesia care in non-operating room settings, including portable anesthesia machines, monitoring devices, and emergency equipment.

**Quality Improvement and Patient Outcomes:** Assessment of outcomes, patient satisfaction, and quality improvement initiatives specific to NORA, aiming to enhance patient care, safety, and efficiency.

### **Unit 3:**

- e) Organ transplantation procedures: Exploring the principles and techniques of organ transplantation surgeries, such as kidney transplant, liver transplant, and heart transplant, and understanding the perioperative management, immunosuppression and ethical considerations associated with transplant surgeries. - 25 Hours
- f) Preoperative evaluation and management of transplant recipients: Studying the preoperative assessment, optimization, and management of transplant recipients, including organ allocation, cross-matching, and immunological considerations - 15 Hours.
- g) Postoperative care and immunosuppression in transplant surgeries: Understanding the postoperative care protocols, including immunosuppressive drug regimens, infection prevention strategies, and long-term follow-up care for transplant recipients. - 15 Hours

### **Practicals in Specialized Surgery-2:**

**(50 Hours)**

#### **a) Robotic-Assisted Surgical Procedures:**

Demonstration and hands-on practice with robotic surgical systems, such as the da Vinci Surgical System, including instrument docking, console operation, and manipulation of robotic arms.

Role-playing exercises to simulate the roles and responsibilities of OT and AT professionals during robotic-assisted surgeries, focusing on effective communication, teamwork, and coordination.

Interactive discussions on patient positioning considerations, pneumoperitoneum management, and the role of anesthesia in facilitating robotic-assisted procedures.

**b) BIS, NMT, Ultrasound, Navigation:**

Hands-on training on the use of monitoring devices like Bi-spectral Index (BIS) and neuromuscular monitoring (NMT), including electrode placement, calibration, and interpretation of data.

Practical sessions on ultrasound-guided regional anesthesia techniques, such as nerve blocks, highlighting the principles of probe handling, needle visualization, and local anesthetic administration.

Introduction to navigation systems used in surgeries, such as image-guided navigation for spine surgery, and demonstration of their use in surgical planning and intraoperative guidance.

**c) Non-Operative Room Anesthesia (NORA):**

Case-based discussions and interactive sessions on the different procedures performed in non-operating room settings, including interventional radiology, endoscopy, and cardiac catheterization.

Simulation-based training on sedation techniques in non-operating room settings, focusing on patient assessment, drug selection, monitoring and management of sedation-related complications.

Practical sessions on radiation safety protocols, infection control measures, and communication/documentation practices specific to NORA procedures.

**d) Organ Transplantation Procedures:**

Interactive discussions on the principles and techniques of organ transplantation surgeries, such as kidney transplant, liver transplant, and heart transplant, including organ preservation, graft implantation, and vascular anastomosis.

Simulation scenarios to understand the perioperative management of transplant recipients, including preoperative evaluation, optimization and immunosuppressive drug regimens.

Role-playing exercises to simulate postoperative care scenarios for transplant recipients, focusing on infection prevention strategies, long-term follow-up care, and coordination with multidisciplinary teams.

**e) Preoperative Evaluation and Management of Transplant Recipients:**

Case discussions and interactive sessions on the preoperative assessment and management of transplant recipients, including organ allocation, cross-matching, and immunological considerations.

Hands-on training on laboratory techniques used in transplant medicine, such as HLA typing and cross-matching tests.

Interactive sessions on ethical considerations in organ transplantation, including organ donation, allocation policies, and patient selection criteria.

**f) Postoperative Care and Immunosuppression in Transplant Surgeries:**

Practical training on the management of immunosuppressive drug regimens commonly used in transplant recipients, including drug interactions, dose adjustments, and monitoring of therapeutic levels.

|             |                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01:</b> | Explain the principles, techniques, and setup of robotic-assisted surgeries such as prostatectomy, hysterectomy, and colorectal procedures, along with the roles and responsibilities of OT and AT professionals.         |
| <b>C02:</b> | Discuss and apply anaesthetic considerations and techniques specific to robotic-assisted surgeries, including patient positioning, pneumoperitoneum management, and anesthetic agent selection.                           |
| <b>C03:</b> | Demonstrate the use of advanced monitoring technologies such as BIS, NMT, Ultrasound, and Navigation for enhancing intraoperative safety and precision.                                                                   |
| <b>C04:</b> | Analyze the principles, challenges, and safety considerations in Non-Operative Room Anaesthesia (NORA) for various diagnostic and interventional procedures, including sedation, radiation safety, and infection control. |
| <b>C05:</b> | Evaluate the perioperative management and ethical considerations in organ transplantation procedures such as kidney, liver, and heart transplants, focusing on immunosuppression and hemodynamic stability.               |
| <b>C06:</b> | Formulate preoperative, intraoperative, and postoperative anaesthetic management plans for transplant recipients, including cross-matching, immunosuppression, infection prevention, and long-term care.                  |

**BAOTT-026 Course Outcomes (COs): Specialized Anaesthesia & Surgery 3**

**(60 Hours)**

**Learning Objectives**

**Credit 2**

The course's goal is to give learners a thorough understanding of research methodologies, their applications, and the necessity of expanding knowledge and solving issues. It discusses numerous research methodologies and their applications in various fields, as well as research ethics issues such as informed permission, confidentiality, and privacy. Students will also gain knowledge of research design, fundamental biostatistics principles, data kinds, research tools and data collection methods, sampling procedures, and formulating a research proposal.

The course also emphasizes the significance of ethical issues in research, such as informed consent, confidentiality, and privacy, as well as the significance of ethical rules and legislation. Students will also learn about different forms of data, data gathering methods, and the peer review and ethical approval procedure for research ideas.

After completing the course, students will be able to identify and formulate research problems and questions, evaluate ethical considerations, select appropriate research designs, apply basic biostatistics concepts, classify and handle different types of data in research analysis, effectively use various research tools and data collection methods, and develop a well-structured research report.

## **Research Methodology and Biostatistics**

The objective of this module is to help the students understand the basic principles of research and methods applied to draw inferences from the research findings.

### **Unit 1:**

Introduction to research methods 5 Hours

Identifying research problem- 5 Hours

Ethical issues in research - 5 Hours

Research design - 10 Hours.

### **Unit 2:**

Basic Concepts of Biostatistics- 10 Hours

Types of Data - 5 Hours

Research tools and Data collection methods - 5 Hours.

Sampling methods- 5 Hour

Developing a research proposal - 10 Hours

|             |                                                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C01:</b> | Explain the fundamental concepts and importance of research methodology, including the process and purpose of scientific research in healthcare and allied sciences.   |
| <b>C02:</b> | Identify and discuss ethical considerations and responsibilities of researchers in conducting ethical and valid studies.                                               |
| <b>C03:</b> | Differentiate and design appropriate research methodologies and study designs (experimental, observational, descriptive) relevant to biomedical and clinical research. |
| <b>C04:</b> | Interpret and apply basic concepts of biostatistics, including data types, measures of central tendency, dispersion, and graphical representation of data.             |
| <b>C05:</b> | Analyze various data collection tools, sampling methods, and techniques to ensure reliability, validity, and representativeness of research data.                      |
| <b>C06:</b> | Develop and present a structured research proposal incorporating problem identification, objectives, methodology, and ethical compliance.                              |

## Seventh and Eighth Semester

The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 8 hours per day and this may be more depending on the need and the healthcare setting.

### Teaching and Examination Pattern

Here is a proposed teaching and examination pattern for the Bachelor in Anaesthesia & Operation Theatre Technology program.

(L - Lectures, T - Theory, P/D – Practical/Demonstration, CLP – Clinical Posting, CR - Credits. IA - Internal Assessment, SEE – Semester End Examination)

### First Semester:

| Course Code | Course Title                                  | Teaching Hour |       |       | CR | Theory |    |     | Practical |      |      | Grand Total (Marks) |
|-------------|-----------------------------------------------|---------------|-------|-------|----|--------|----|-----|-----------|------|------|---------------------|
|             |                                               | L hr s.)      | P / D | C L P |    | SEE    | IA | T   | SEE       | IA   | T    |                     |
| BAOTT-001   | Basics of Healthcare Delivery System in India | 80            | ....  | ....  | 4  | 40     | 10 | 50  | ....      | .... | .... | 50                  |
| BAOTT-002   | Medical Terminology & Record Keeping          | 50            | ....  | ....  | 3  | 40     | 10 | 50  | ....      | .... | .... | 50                  |
| BAOTT-003   | Anatomy                                       | 100           | 40    | ....  | 6  | 80     | 20 | 100 | 40        | 10   | .... | 150                 |
| BAOTT-004   | Physiology                                    | 100           | 40    | ....  | 6  | 80     | 20 | 100 | 40        | 10   | .... | 150                 |
| BAOTT-005   | Healthcare Quality & Patient Safety           | 40            | 60    | ....  | 5  | 40     | 10 | 50  | 30        | 20   | 50   | 100                 |

|             |         |         |           |                |      |     |     |      |      |    |     |
|-------------|---------|---------|-----------|----------------|------|-----|-----|------|------|----|-----|
| sTotal      | 37<br>0 | 14<br>0 | ....<br>. | 24             | .... | ... | 350 | .... | .... | 50 | 500 |
| Grand Total | 510     |         |           | .....<br>..... |      |     |     |      |      |    |     |

## Second Semester:

| Course Code  | Course Title                                                       | Teaching Hour |            |             |           | Theory      |            |            | Practical   |            |            | Grand Total (Marks) |
|--------------|--------------------------------------------------------------------|---------------|------------|-------------|-----------|-------------|------------|------------|-------------|------------|------------|---------------------|
|              |                                                                    | L (hrs.)      | P/D        | CLP         | CR        | SEE         | IA         | T          | SEE         | IA         | T          |                     |
| BAOTT-006    | Medical Law & Ethics, Principles of Management                     | 60            | ....       | ....        | 4         | 40          | 10         | 50         | ....        | ...        | ....       | 50                  |
| BAOTT-007    | Basics of Biomedical Sciences in Surgery & Anesthesia              | 40            | 60         | ....        | 3         | 40          | 10         | 50         | ....        | ...        | ....       | 50                  |
| BAOTT-008    | Biochemistry & Hematology                                          | 40+           | 0+         | ....        | 3         | 40+         | 10+        | 100        | 30          | 20         | 50         | 150                 |
|              |                                                                    | 30            | 30         |             |           | 40          | 10         |            |             |            |            |                     |
| BAOTT-009    | Pathology & Microbiology                                           | 50+           | .....      | ....        | 4         | 40+         | 10+        | 100        | ....        | ...        | ....       | 100                 |
|              |                                                                    | 50            | .          |             |           | 40          | 10         |            |             |            |            |                     |
| BAOTT-0010   | Basic Concept in Pharmacology                                      | 40            | .....      | ....        | 2         | 40          | 10         | 50         | ....        | ...        | ....       | 50                  |
| BAOTT-0011   | Basic Computer & Information Sciences, communication & Soft Skills | 40            | 60         | 0           | 4         | 40          | 10         | 50         | 30          | 20         | 50         | 100                 |
| <b>Total</b> |                                                                    | <b>350</b>    | <b>150</b> | <b>....</b> | <b>20</b> | <b>....</b> | <b>...</b> | <b>400</b> | <b>....</b> | <b>...</b> | <b>100</b> | <b>500</b>          |

### Third Semester

| Course Code         | Cours e Title                             | Teaching Hours |      |       |       | Theory |     |     | Practical |      |      | Grand Total (Marks) |
|---------------------|-------------------------------------------|----------------|------|-------|-------|--------|-----|-----|-----------|------|------|---------------------|
|                     |                                           | L (h r s.)     | P/ D | C L P | C R   | SEE    | IA  | T   | SEE       | IA   | T    |                     |
| BAOTT-012           | Basic Techniques of Anesthesia            | 100            | .... | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                 |
| BAOTT-013           | Basics of Surgical Procedures             | 100            | .... | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                 |
| BAOTT-014           | CSSD & Manifold area                      | 50             | .... | 100   | 4     | 40     | 10  | 50  | ....      | .... | .... | 50                  |
| BAOTT-015           | Industrial Orientation & Industrial Visit | 50             | .... | 0     | 2     | 40     | 10  | 50  | ....      | .... | .... | 50                  |
| Total               |                                           | 300            | .... | 200   | 16    | ....   | ... | 300 | ....      | .... | 100  |                     |
| Grand Total (Hours) |                                           | 510            |      |       | ..... |        |     |     |           |      |      | 400                 |
|                     |                                           |                |      |       | ..... |        |     |     |           |      |      |                     |

### Fourth Semester:

| Course Code        | Course Title                   | Teaching Hour |            |            |           | Theory      |            |            | Practical   |             |            | Grand Total (Marks) |
|--------------------|--------------------------------|---------------|------------|------------|-----------|-------------|------------|------------|-------------|-------------|------------|---------------------|
|                    |                                | L (hrs)       | P / D      | C L P      | C R       | SEE         | IA         | T          | SEE         | IA          | T          |                     |
| BAOTT-016          | Advanced Anesthesia Techniques | 100           | ...        | 50         | 5         | 80          | 20         | 100        | 40          | 10          | 50         | 150                 |
| BAOTT-017          | Advanced Surgical Procedures   | 100           | ...        | 50         | 5         | 80          | 20         | 100        | 40          | 10          | 50         | 150                 |
| BAOTT-018          | Basic Intensive CARE           | 50            | ...        | 100        | 4         | 40          | 10         | 50         | 30          | 20          | 50         | 100                 |
| BAOTT-019          | Clinical Medicine & Management | 50            | ...        | 0          | 2         | 40          | 10         | 50         | ....        | ....        | ....       | 50                  |
| <b>Total</b>       |                                | <b>300</b>    | <b>...</b> | <b>200</b> | <b>16</b> | <b>....</b> | <b>...</b> | <b>300</b> | <b>....</b> | <b>....</b> | <b>150</b> |                     |
| <b>Grand Total</b> |                                | <b>500</b>    |            |            |           | .....       |            |            |             |             |            | <b>450</b>          |
| <b>(Hours)</b>     |                                |               |            |            |           | .....       |            |            |             |             |            |                     |

### Fifth Semester.

| Course Code | Course Title                                   | Teaching Hour |       |       |       | Theory |     |     | Practical |      |      | Grand Total (Marks) |
|-------------|------------------------------------------------|---------------|-------|-------|-------|--------|-----|-----|-----------|------|------|---------------------|
|             |                                                | L (hrs.)      | P / D | C L P | CR    | SEE    | IA  | T   | SEE       | IA   | T    |                     |
| BAOTT-020   | Specialized Anesthesia                         | 100           | ....  | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   |                     |
| BAOTT-021   | Specialized Surgery                            | 100           | ....  | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                 |
| BAOTT-022   | Recent Advances in Anesthesia & Surgical Field | 50            | ....  | 50    | 5     | 80     | 20  | 100 | ....      | .... | .... | 100                 |
| BAOTT-023   | Disaster Management & Environmental Science    | 100           | ....  | 0     | 2     | 40     | 10  | 50  | ....      | .... | .... | 50                  |
| Total       |                                                | 400           | ....  | 150   | 17    | ....   | ... | 350 | ....      | .... | 100  | 450                 |
| Grand Total |                                                | 510           |       |       | ..... |        |     |     |           |      |      |                     |
| (Hours)     |                                                |               |       |       | ..... |        |     |     |           |      |      |                     |

### Sixth Semester:

| Course Code | Course Title                           | Teaching Hour |    |       |       | Theory |     |     | Practical |      |      | Grand Total (Marks ) |
|-------------|----------------------------------------|---------------|----|-------|-------|--------|-----|-----|-----------|------|------|----------------------|
|             |                                        | L (hrs)       | P  | C L P | CR    | SEE    | IA  | T   | SEE       | IA   | T    |                      |
| BAOTT-024   | Specialized Anesthesia-2               | 100           | .. | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                  |
| BAOTT-025   | Specialized Surgery-2                  | 100           | .. | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                  |
| BAOTT-026   | Specialized Anesthesia & Surgical-3    | 100           | .. | 50    | 5     | 80     | 20  | 100 | 40        | 10   | 50   | 150                  |
| BAOTT-027   | Research Methodology & Biostatistics " | 50            | .. | 0     | 2     | 40     | 10  | 50  | ....      | .... | .... | 50                   |
| Total       |                                        | 350           | .. | 150   | 17    | ....   | ... | 350 | ....      | .... | 150  | 500                  |
| Grand Total |                                        | 500           |    |       | ..... |        |     |     |           |      |      |                      |
| (Hours)     |                                        |               |    |       | ..... |        |     |     |           |      |      |                      |

### Seventh and Eighth Semester:

| Course Code | Course Title                                        | Time Period |
|-------------|-----------------------------------------------------|-------------|
| BAOTT-028   | BAOTT Internship (Anesthesia, Surgery, Specialties) | One Year    |

|        |                                             |                                                                                                                                                                                                                                                                                                                                                          |
|--------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13     | Basics of Surgery & Related Management      | <p>a. Fullerton's Surgical Technology (Fullerton) (Author)</p> <p>b. D. C. Fullerton's Medical &amp; Surgical Technology, 10th Edition, S. K. Kataria.</p> <p>c. Oxford Surgical Technology, 10th Edition, S. K. Kataria.</p> <p>d. Surgical Technology for the surgical technologist by, association of surgical technologists, 1st Edition, by Aru</p> |
| 14     | Specialized Anesthesia                      | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 3. No. | Subject Name                                | Reference Books                                                                                                                                                                                                                                                                                                                                          |
| 1      | Techniques of Anaesthesia                   | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 20     | Specialized Anesthesia & Surgery 3          | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 15     | Specialized surgery 1                       | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 3      | Basics                                      | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 9      | SSD & Manifest Area. science                | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 16     | Recent Advances in surgery                  | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 10     | Anesthesia and Surgical Fields              | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 4      | Biochemistry & Hematology                   | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 17     | Community Medicine & Environmental Sciences | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 11     | Advanc                                      | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
| 18     | Specialized Anesthesia                      | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |
|        | Procedure                                   | <p>a. Miller's Anesthesia, 8th Edition, 2013, Elsevier.</p> <p>b. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>c. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p> <p>d. Textbook of Anesthesia, 10th Edition, 2013, Jaypee Brothers.</p>                                                                         |

|           |                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>21</b> | Research<br><br>Methodology<br>and<br>Biostatistics | a. Research methodology by C R Kothari                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>22</b> | Miscellaneous Books                                 | a. ECG made easy, Atul Luthra,<br>b. Paramedics 6 in 1 Handbook, G Mogli,<br>c. A First handbook of Medical Instruments, A Bhoomika/ G. Chatterjee,<br>d. Hospital Acquired Infection, Neeta Patwardhan, Satish Patwardhan,<br>e. Fluid Therapy, Rashmi Dutta,<br>f. Manual of First Aid, LC Gupta, g. Instrument and Operative Surgery, AK Gvalani<br>a. The little ICU book, Paul L. Marino,<br>b. Environmental studies for UG Courses, Erach Bharucha, UGC. |

### Professionalism in the Operating Room and Anaesthesia Technologists:

As an OT and Anaesthesia Technologist, it is critical to maintain a high standard of professional behavior in order to guarantee patient safety, maintain workplace professionalism, and contribute to the overall efficacy of the healthcare team.

In order to improve your abilities as a Surgical and Anaesthesia Technologist, look for possibilities for professional growth and development. Keep up with the most recent developments in anaesthesia control, surgical technique, and patient safety.

Here are some crucial professional conduct guidelines to remember:

**Patient Security:** To reduce the risk of mistakes and problems during surgical and anaesthesia operations, adhere to established protocols and recommendations.

Maintain a clean and sterile operating room environment by following infection control procedures.

**Competence and Professional Development:** Strive for excellence in your profession on a regular basis.

Keep up to date on the most recent innovations and best practices in operation theatre and Anaesthesia Technology.

Maintain a professional look and demeanor by following to the authorized dress code and wearing adequate personal protection equipment (PPE) in the operation theatre.

Maintain a cheerful and polite demeanor towards patients, coworkers, and other healthcare professionals.

Empathy, compassion, and attention to the needs and concerns of patients and their families are required.

Communication abilities: Improve your verbal and written communication abilities.

Policy and protocol adherence: Familiarize yourself with the institution's or facility's standard operating procedures and policies.

Professional Honesty: Maintain the finest professional ethics.

Be truthful, dependable, and accountable for your activities.

Avoid any activity that may jeopardize the integrity of the profession or patient care.

Recognize and appreciate the contributions of a diverse healthcare workforce.

Continuous Improvement: Adopt a continuous improvement mentality.

To improve your abilities and performance, seek feedback from superiors, coworkers, and patients.

By following these professional behavior norms, Anaesthesia & Operation Theater Technologists may help to provide safe, efficient, and compassionate treatment in the surgical context.

**BAOTT INTERNSHIP LOGBOOK PROFORMA:**

**Institute Name & Logo**

**Logbook for BAOTT Internship**

**Program**

**Student Name .....**

**Year & Month .....**

**Regd. No. ....**

### **BIODATA OF THE STUDENT**

|                                      |  |
|--------------------------------------|--|
| Name                                 |  |
| D.O. B                               |  |
| Parents Name                         |  |
| Regd. No                             |  |
| Year of Passing 10+2                 |  |
| Date of J oining BAOTT               |  |
| Date of completion of Final Semester |  |
| Permanent Address                    |  |
| Postal Address                       |  |
| Mobile No. of Student                |  |
| Mobile No. of Parents                |  |
| Email                                |  |
| Other Achievements                   |  |

### Guidelines for Logbook Entry Outcome:

Outcome: Morbidity/ Mortality/Any major complication should be indicated with measures taken for timely management.

1. The candidate should make the entries in the logbook daily, countersigned by the Assistant Professor/ Associate Professor/ Professor/ Head of the Department.
2. The Associate Professor / Professor must review & sign the logbook every week for short-duration postings & every month for long duration postings

In emergency OT posting the logbook will be countersigned by Senior Resident duty.

The logbook is to be submitted through the Professor /Associate Professor at the time of the final examination. Please use clear handwriting for filling the Logbook.

NOTE- Duration 12 months (Anesthesia- 6 months & Surgical Disciplines 6 months)

### Protocol for Internship Postings

| Department/Area of Posting               | Nature of Posting | Duration of Posting |
|------------------------------------------|-------------------|---------------------|
| Anesthesia Department                    | Regular           | 5 Months            |
| Critical Care Unit                       | Regular           | 1 Month             |
| General Surgery, Obstetrics & Gynecology | Regular           | 1 Month             |

|                                         |         |         |
|-----------------------------------------|---------|---------|
| Uro surgery & Pediatric Surgery         | Regular | 1 Month |
| CTVS & Neurosurgery                     | Regular | 1 Month |
| Emergency/Trauma OT &<br>Orthopedics OT | Regular | 1 Month |
| CSSD                                    | Regular | 1 Month |
| Minor Surgery                           | Regular | 1 Month |

**Logbook Proforma: (BAOTT INTERNSHIP)**

**Area of Posting..... Period.....to.....**

|                                            |  |  |  |  |  |  |
|--------------------------------------------|--|--|--|--|--|--|
| Date                                       |  |  |  |  |  |  |
| Patient ID                                 |  |  |  |  |  |  |
| Age/Sex                                    |  |  |  |  |  |  |
| Diagnosis                                  |  |  |  |  |  |  |
| Operative Procedure                        |  |  |  |  |  |  |
| Anesthetic Technique                       |  |  |  |  |  |  |
| Special Procedure                          |  |  |  |  |  |  |
| In time                                    |  |  |  |  |  |  |
| Out time                                   |  |  |  |  |  |  |
| Observation/Work done/Newly learned things |  |  |  |  |  |  |
| Signature of Faculty/Senior Resident       |  |  |  |  |  |  |

Course Coordinator Signature: .....

## **GUIDELINES FOR INTERNSHIP:**

1. The internship is compulsory.
2. Duration of the internship shall be one year
3. Maintain professionalism at all times, including OT attire, communication and interactions with respect to patient confidentiality and adhere to Hospital and University rules & regulations.
4. Follow the chain of command and communicate effectively with supervisors and team members.
5. The degree of Baccalaureate in Anaesthesia and Operation Theatre Technology shall be awarded after the completion of internship.
6. The candidate should make the entries in the log book daily, countersigned by (Concern faculty) the Assistant Professor / Associate Professor / Professor / Head of the Department.
7. The logbook is to be submitted to the Department at the time of the final examination.

## **Evaluation of Internees:**

- A. Educative assessment/Assessment for learning: Assessment of the interneen on daily basis during internship and postings should be done by the Head of the Department. Objective– To develop minimum professional skills. Maintaining Log book by interneen
- B. Cumulative assessment: Under the observation of Technical staff/Faculty of the concerned department and maintained Log book by the interns. Certificate shall be issued after these two evaluations.
- C. Duration of Internship: One year  
Total working hours – Minimum 1440  
hours Total working hours/day - 8  
hours/day Lunch Time – 1 hour

## **Learning Objectives:**

1. Develop proficiency in setting up and maintaining anaesthesia and surgical equipment.
2. Gain skills in assisting with patient preparation, positioning, and draping.
3. Learn to assist anaesthesia providers during induction, maintenance, and emergence phases.
4. Acquire knowledge of sterile technique and infection control practices.
5. Develop abilities to recognize and respond to intraoperative emergencies.
6. Enhance communication skills for effective patient interaction and advocacy.
7. Foster teamwork and collaboration within the interdisciplinary surgical team.
8. Demonstrate professionalism and ethical conduct in all interactions.
9. Engage in continuous learning and professional development activities.
10. Develop critical thinking and problem-solving abilities for perioperative challenges.

## **Expected Outcomes:**

1. Demonstrated competence in anaesthesia and surgical equipment setup and

maintenance.

2. Provision of compassionate and attentive care to surgical patients.
3. Effective collaboration and communication within the surgical team.
4. Ability to respond appropriately to intraoperative emergencies.
5. Adherence to professionalism and ethical standards in practice.

6. Engagement in on-going education and professional development.
7. Application of critical thinking skills to perioperative situations.
8. Accurate documentation of procedures and interventions.
9. Advocacy for patient safety, comfort, and well-being.
10. Adherence to infection control and safety protocols.

### **Note/Protocols**

1. Documentation:
  - a) Accurately document all procedures, observations, and interventions in the patient's medical record.
  - b) Use clear and concise language following University/institutional guidelines for documentation.
2. Leave for Interns:
  - a) No leave / absence is allowed to an Intern except as may be permitted by University/Institute
  - b) Total leave allowed – Maximum 30 days during whole one year of internship
  - c) Maximum leave allowed at a time: 10 days.
3. Communication:
  - a) Communicate relevant information to the anesthesia team, surgeon, and nursing staff during handoffs and transitions of care.
  - b) Document any verbal orders or instructions received during procedures promptly.
4. Safety Precautions:
  - a) Adhere to protocols for infection control and aseptic technique in the operating room.
  - b) Verify patient identification, surgical site, and procedure before the start of each case.
  - c) Follow established procedures for the handling and disposal of biohazardous materials.
5. Incident Reporting:
  - a) Report any adverse events, near misses, or equipment malfunctions promptly to the appropriate personnel.
  - b) Document incidents accurately and thoroughly using the institution's incident reporting system.
6. Confidentiality:
  - a) Maintain patient confidentiality at all times, both in verbal communication and electronic documentation.
  - b) Avoid discussing patient information in public areas or with unauthorized individuals.

## Competencies Statement

| Performance Criteria                         | Indicators                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              | Knowledge                                                                                                                                                                                                                                                                                                                                                                                              | Skill                                                                                                                                                                                                                         | Behavior                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Capability to Anticipate and Prepare:</b> | <p>Should have in depth knowledge about various general health conditions while examination</p> <p>Should have essential knowledge about providing care to each individual who visits to your hospital</p> <p>Should be aware of different types of disabilities and information on patients with additional needs</p> <p>Should have essential knowledge about rights and dignity of the patients</p> | <p>Proficiency in assisting surgeons/ anaesthetist with equipment's machines instruments, and suturing.</p> <p>Competence in aiding anesthetists with anesthesia induction, airway management, and vital sign monitoring.</p> | <p>Proactive attitude in preparing for procedures and anticipating the needs of the surgical team/ Anesthesia team.</p> <p>Attention to detail, ensuring proper organization of instruments and supplies.</p> <p>Effective time management and collaboration with the surgical team.</p> <p>Adaptability to handle unexpected situations and adjustments during surgery.</p> <p>Professionalism, including</p> |

|                                               |                                                                                               |                                                                                                    |                                                                                             |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                                               |                                                                                               |                                                                                                    | confidentiality, ethical conduct, and respect for boundaries.                               |
| <b>Maintaining a strict sterile technique</b> | Thorough understanding of the principles of aseptic technique and sterile field maintenance . | Proficiency in performing hand hygiene using appropriate handwashing or hand sanitization methods. | Maintaining appropriate hand hygiene procedures both inside and outside the operating room. |

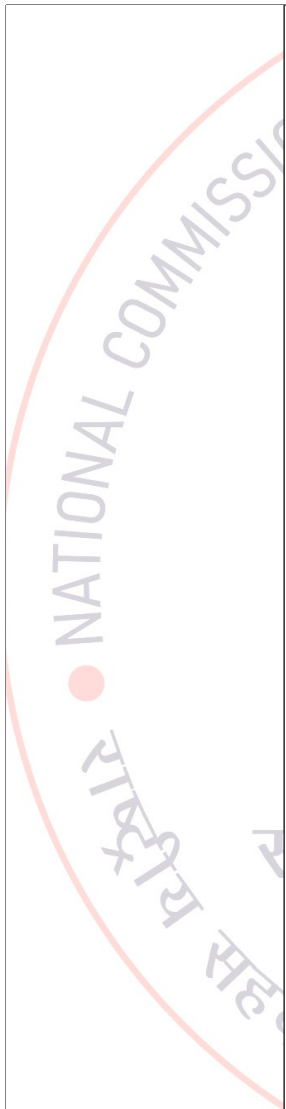
|  |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Knowledge of infection control guidelines, including hand hygiene, proper gowning and gloving techniques, and disinfection protocols. Familiarity with different types of sterilization methods, such as steam sterilization, ethylene oxide sterilization, and sterile packaging</p> | <p>Competence in donning sterile gowns and gloves without contaminating them and in maintaining sterility while working within the sterile field. Skill in handling sterile instruments, supplies, and drapes to prevent contamination and maintain a sterile environment. Ability to assist surgeons and anesthesiologists in maintaining sterility during procedures, such as passing instruments or opening sterile packages.</p> | <p>Diligently adhering to the recommended gowning and gloving procedures to protect oneself and the patient. Pay close attention to protecting the sterile field's integrity by limiting air circulation, preventing needless movements, and contaminating it with non-sterile things. Strict adherence to sterile procedure during instrument handling, making sure that instruments stay in the sterile field and maintaining the proper sterile instrument passes. Addressing any breaches of sterile</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                    |  |                                                                                                                                                                                                                                                                                                     |
|--|------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | <p>technique or potential contamination as soon as possible, taking corrective action, and, as necessary, informing the surgical team. Maintaining sterility during the procedure with constant attention and awareness while aggressively looking out for any potential breaks or compromises.</p> |
|--|------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                      |                                                                                                                                                                                               |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Instrumentation and Equipment</b> | <p>Understanding of surgical instruments and their uses.</p> <p>Familiarity with medical equipment, such as anesthesia machines and monitors. Knowledge of equipment setup and placement.</p> | <p>Proficiency in handling surgical instruments and ensuring their sterility. Ability to set up and place medical equipment accurately. Skill in operating equipment and adjusting settings. Troubleshooting abilities for equipment malfunctions.</p> | <p>Continuously update knowledge of instruments and equipment.</p> <p>Ensure instruments are clean and organized. Double-check equipment setup for patient safety. Communicate effectively with surgeons and anaesthetists. Promptly address equipment issues during procedures. Collaborate with appropriate personnel for complex troubleshooting.</p> |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                   |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Surgical Assistance</b></p> | <p>Understanding of surgical procedures, including laparoscopic, arthroscopic, and robotic techniques. Knowledge of different surgical instruments, sutures, and their uses. Familiarity with sterile techniques and maintaining a sterile field.</p> | <p>Proficiency in directly supporting the surgeon during procedures.</p> <p>Ability to anticipate the surgeon's needs and provide timely assistance.</p> <p>Skill in passing sutures, instruments, and other necessary items accurately.</p> <p>Competence in scrubbing for more technical procedures like laparoscopic, arthroscopic, and robotic surgeries.</p> | <p>Adhere to the surgeon's directions promptly and accurately.</p> <p>Anticipate the surgeon's demands and prepare instruments or sutures in advance.</p> <p>Maintain clear and open communication with the surgeon throughout the procedure.</p> <p>Collaborate with the surgical team to ensure effective teamwork.</p> |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                           |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                           |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                       | <p>Demonstrate attentiveness and responsiveness during the surgery. Continuously enhance knowledge of surgical procedures and instruments. Adhere to sterile techniques and maintain a sterile environment .</p>                                          |
| <b>Anesthesia Support</b> | <p>Understanding of anesthesia administration and management. Familiarity with the different stages of anesthesia induction and maintenance. Awareness of monitoring vital signs, oxygen saturation, and end-tidal carbon dioxide levels</p> | <p>Proficiency in assisting with the administration and supervision of Anaesthesia</p> <p>Ability to assist in securing and positioning patients during anaesthesia induction.</p> <p>Ability to monitor and assess vital signs, oxygen saturation, and end-tidal</p> | <p>Collaborate closely with the anaesthetist, following their instructions and assisting with anaesthesia administration .</p> <p>Help secure and position patients during anaesthesia induction and throughout the procedure. Pay close attention to</p> |



|                                       |                                                                       |                                                                             |                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | <p>taking ABG sample, BIS, NMT, Arterial line/CVP line insertion.</p> | <p>carbon dioxide levels.</p>                                               | <p>any changes or irregularities in patient conditions. Promptly communicate any significant changes to the anaesthetist and surgical team.</p> |
| <p><b>Emergency Preparedness:</b></p> | <p>Understanding of emergency procedures and protocols.</p>           | <p>Proficiency in identifying and accessing emergency equipment quickly</p> | <p>Proactively learn about emergency procedures and equipment locations.</p>                                                                    |

|                                                                                                  |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                  | <p>Knowledge of the locations and functions of emergency equipment/ crash carts. Familiarity with potential postoperative complications and their management.</p>                                                                                                                               | <p>Ability to remain calm and composed in high- stress situations. Competence in following established emergency protocols. Skill in assisting the surgical team during crises or postoperative difficulties.</p>                                   | <p>Follow established protocols and guidelines for emergency situations. Assist the surgical team promptly and effectively during crises. Continuously update knowledge of emergency procedures and best practices.</p> |
| <p><b>Ability to manage confidentiality of patient's demographic and medical record data</b></p> | <p>Should have adequate knowledge of data protection and how this will impact security, access and confidentiality of the patient's records.</p> <p>Should have essential knowledge to ensure the patient environment will remain safe and user-friendly, in terms of access and facilities</p> | <p>Conversant in using various digital devices, access cloud storage platforms and saves electronic medical records on system-based software programs and keeps them safe.</p> <p>Demonstrates how to store and retrieve manual medical records</p> | <p>Seeks consent of the patient before providing information to external stakeholders.</p> <p>Restricts self from discussing patient information and condition in any open forum/ external communication</p>            |

|                                                                                                 |                                                                                                          |                                                                                      |                                              |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------|
|               |                                                                                                          |                                                                                      |                                              |
| <b>Ability to promote ethical and cordial relationship with other health care professionals</b> | Should have essential knowledge of how to maintain practice in accordance with other professional health | Explains the condition that are treatable/correctable beyond your practice standards | Honesty and understanding of own limitations |

|                                                                                          |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                   |                                                           |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Ability to handle critical, narcotic drugs</b>                                        | Should have essential knowledge of how handle various drugs.                                                                                                                                                                                                                                           | Maintain the record, stock and documentation of drug uses in anaesthesia.                                                                                                                         | Should have proper knowledge and protect misuse of drugs. |
| <b>Ability to comply with legal, professional and ethical guidelines, law and codes.</b> | <p>Should have in depth knowledge of ethical practice and standard operating procedures followed in the clinical examination.</p> <p>Should have vital knowledge of the law, codes and guidelines set by the regulatory body of profession and is fully aware of the consequences if not followed.</p> | <p>Explains the uses of various diagnostic instruments and their importance in the process of examination.</p> <p>Follows the code of conduct set down by the council/appropriate authorities</p> |                                                           |

## Skills based outcomes and monitorable indicators for Operation Theatre

### Competency statements

1. Demonstrate ability to prepare and maintain Operation Theater
2. Demonstrate ability to maintain equipment support in an acute care environment
3. Identify and move to maintain a sterile field
4. Follow infection control policies and procedures
5. Manage and maintain theater equipment
6. Demonstrate ability to prepare the patient for operative procedures
7. Provide intra-operative equipment and technical support
8. Demonstrate skills and knowledge to assist anesthetist in handling emergencies outside of OT Room
9. Manage hazardous waste and follow biomedical waste disposal protocols
10. Ensure availability of medical and diagnostic supplies
11. Monitor and assure quality
12. Act within the limits of one's competence and authority
13. Work effectively with others
14. Manage work to meet requirements
15. Maintain a safe, healthy, and secure working

| S. no. | Learning outcomes                                               | Knowledge/ comprehension                                                                                     | Applications / synthesis /evaluation                                                                                    | Hours |
|--------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------|
| 1      | Prepare and maintain Operation Theatre                          | Be familiar with the Operation Theatre and all the equipment.                                                | Prepare the OT for the operation along with all the necessary equipment.                                                | 300   |
|        |                                                                 | Know the protocols used in Operation Theatre                                                                 | Interpret and understand all planning techniques to keep an OT functional.                                              |       |
| 2      | Maintain equipment support in an acute care environment         | Use basic knowledge of surgical procedures to assist and identify the needs of equipment of Operating teams. | Clean and store equipment safely                                                                                        | 300   |
|        |                                                                 |                                                                                                              | Position equipment in accordance with set up procedures                                                                 |       |
| 3      | Assist anaesthetist in handling emergencies outside of OT Room. | Knowledge of assisting anaesthetist outside OT Room.                                                         | Prepare emergency kit to handle areas outside OT Room.                                                                  | 300   |
|        |                                                                 |                                                                                                              | Ensure any signs or symptoms of a clinical emergency is identified correctly and reported to the appropriate clinician. |       |
| 4      | Follow infection control policies and procedures                | Knowledge of effective infection control strategy that ensures the safety of the patient.                    | Perform the standard precautions to prevent the spread of infection in accordance with organization requirements.       | 220   |

|   |                                                         |                                                                                               |                                                                                                                  |     |
|---|---------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----|
| 5 | Ensure availability of medical and diagnostic supplies  | Anticipating demand and ensuring availability of adequate medical and diagnostic supplies.    | Maintain adequate supplies of medical and diagnostic supplies. Arrive at actual demand as accurately as possible | 100 |
| 6 | Prepare patient for operative procedures                | Knowledge of preparing patients as required before the operation.                             | Safely position patient to meet the requirements of the anaesthetist and Surgeon.                                | 200 |
| 7 | Provide intra-operative equipment and technical support | Knowledge to assist the anaesthetist and provide technical support during surgical procedure. | Monitoring the performance of equipment used and adjusting surgical equipment.                                   | 200 |

| S. no. | Learning outcomes                                        | Knowledge/ comprehension                                                                  | Applications / synthesis /evaluation                                                                               | Hours |
|--------|----------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------|
| 8      | Work effectively with others                             | Working with other people to meet requirements                                            | Identify any problems with team members and other people and take the initiative to solve these problems.          | 100   |
|        |                                                          | Communicating with other team members and people internal or external to the organisation | Communicate with other people clearly and effectively                                                              |       |
| 9      | Be able to demonstrate professional behavior             | Explain the legal and ethical guidelines related to the profession                        | Promote collaborative practice                                                                                     | 100   |
|        |                                                          | Be aware of your own competency levels                                                    |                                                                                                                    |       |
| 10     | Be able to complete accurate treatment documentation     | Recognize the importance of accurate documentation                                        | Complete the treatment documentation accurately                                                                    | 50    |
| 11     | Manage hazardous waste                                   | Knowledge of Handle, collect and dispose of the hazardous waste.                          | Coordinate the hazardous waste management program.                                                                 | 100   |
|        |                                                          |                                                                                           | Properly identify, segregate, handle, label, and store waste.                                                      |       |
| 12     | Maintain a safe, healthy and secure working environment. | Complying the health, safety and security requirements and procedures for Workplace.      | Identify individual responsibilities in relation to maintaining workplace health safety and security requirements. | 100   |

|  |  |  |                                                                                  |  |
|--|--|--|----------------------------------------------------------------------------------|--|
|  |  |  | Follow the organization's emergency procedures promptly, calmly, and Efficiently |  |
|--|--|--|----------------------------------------------------------------------------------|--|

| S. no. | Learning outcomes          | Knowledge/ comprehension                            | Applications / synthesis /evaluation                                             | Hours |
|--------|----------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------|-------|
| 13     | Monitor and assure quality | Monitor treatment process/outcomes process/outcomes | Evaluate potential faults in treatment procedures.                               | 200   |
|        |                            | Identify problems in treatment                      | Identify breaches in health, safety and security procedures.                     |       |
|        |                            | Solve treatment process/outcome problems            | Follow the organization's emergency procedures promptly, calmly and efficiently. |       |
|        | Total                      |                                                     |                                                                                  | 2270  |

Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training program. To achieve this, all assessment forms and feedback should be included and evaluated.

#### **Examination:**

There shall be a University examination at the end of each semester. Evaluation is based on formative evaluation (Internal Assessment) and summative evaluation (University examination).

#### **Internal assessment (IA):**

Internal assessment for theory shall be calculated as average of two sessional examinations, seminars, assignments etc. The internal assessment for practicals shall be calculated on the basis of the records of the practicals maintained and examinations.

A Candidate must secure at least 40% of total marks fixed for internal assessment in a particular course in order to be eligible to appear in the university examination of that course. If candidate is having inadequate internal assessment marks shall appear for internal assessment in the next semester.

#### **University examination:**

A candidate who satisfies the requirements of attendance, progress and conduct shall be eligible to appear for the university examinations. There shall be a university examination at the end of each semester.

To be eligible to appear for University examination a candidate should fulfil all the following conditions:

- 80% attendance separately in theory and practical/ Clinical postings, in each course.
- Secure at least 40% of total marks fixed for internal assessment in a particular course in theory and practical separately.
- Submit dissertation in the prescribed format, as per the stipulated schedule in IV semester.

#### **Dissertation:**

A candidate is required to carry out research study in a select area of his subject, under the supervision of a faculty guide. The results of such a study shall be submitted to the University in the form of a dissertation as per the prescribed format and within the date stipulated by the University.

#### **Guide:**

A guide shall be MD/DNB/PG Diploma/M. Sc. or equivalent qualification as recognized by the University in relevant subject with two years' experience in respective Allied Health Science Course. In case of postgraduate diploma, he/she should have two publications in indexed journals. However, a Co-guide can be opted wherever required with prior permission of the Institute and University. The

Co-guide shall also be a postgraduate teacher recognized by the University as a guide.

Candidates shall submit synopsis to the University through the Guide and Head of the Institute, on or before the completion of one month of second semester, or within the date notified by the University, whichever is earlier.

Once the synopsis is approved and registered by the University, no change in the topic or Guide shall be made without the prior approval of the University.

In the event of registered Guide leaving the Institute or in the event of the death of the guide, a change of Guide shall be permitted by the University on the specific recommendation of the Institute.

### **Ethical clearance**

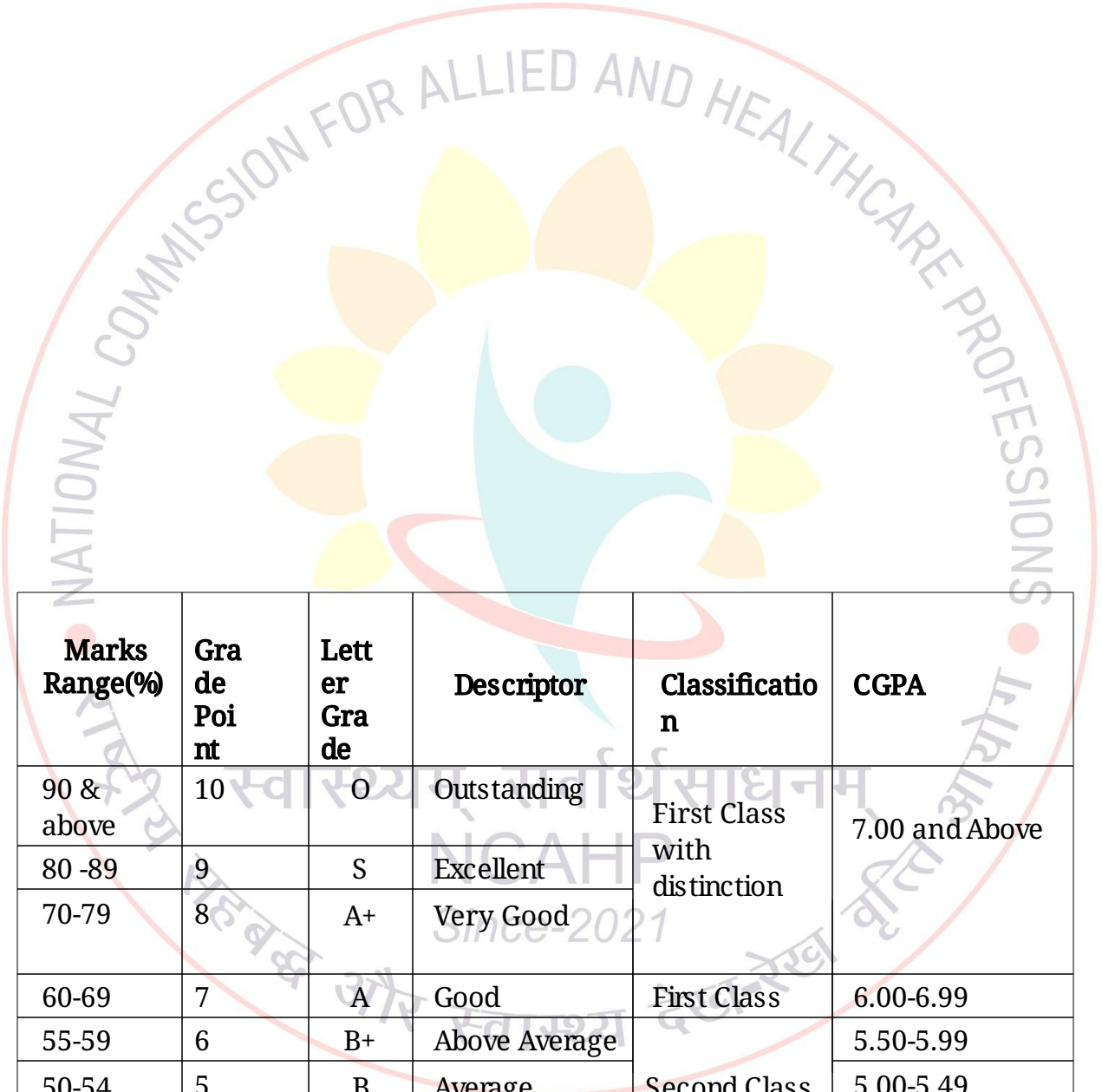
Ethical clearance should be obtained for a study involving any procedure on human subjects. The candidate should apply for the certificate to the Ethics Committee of the respective Institute/University through the Guide and present the study before the Committee for clearance. A copy of the certificate should be attached along with the synopsis forwarded at the time of submission of synopsis. All such clearance should be sought within one month of commencement of II semester.

### **Submission of synopsis**

Synopsis should be verified by guide, HOD and departmental curriculum development cell and approved by the institutional ethics committee before submission to the university. The synopsis should be submitted as per the format, on or before one month of second semester, or within the date notified by the University, whichever is earlier. Once the synopsis is approved and registered by the university, no change in the topic or Guide shall be made without the prior approval of the University.

1 hours/week = 1 credit

Grade point and letter grade received for respective mark range is tabulated below



| Marks Range(%) | Grade Point | Letter Grade | Descriptor    | Classification               | CGPA           |
|----------------|-------------|--------------|---------------|------------------------------|----------------|
| 90 & above     | 10          | O            | Outstanding   | First Class with distinction | 7.00 and Above |
| 80 -89         | 9           | S            | Excellent     |                              |                |
| 70-79          | 8           | A+           | Very Good     |                              |                |
| 60-69          | 7           | A            | Good          | First Class                  | 6.00-6.99      |
| 55-59          | 6           | B+           | Above Average | Second Class                 | 5.50-5.99      |
| 50-54          | 5           | B            | Average       |                              | 5.00-5.49      |
| 40-49          | 4           | C            | Pass          | Pass Class                   | 4.0-4.99       |
| Below 40       | 0           | F            | Fails         | Fail                         | Less than 4.0  |
| Absent         | 0           | I            | Absent        |                              |                |

**Semester Grade Point Average (SGPA)** The overall performance of a student in each semester

**Semester Grade Point Average (SGPA) is computed as follows:**

$$\text{SGPA} = \frac{\sum [(\text{course credit}) \times (\text{Grade point})] \text{ for all courses in that semester; with Letter grades, including F}}{\sum [(\text{course credits})] \text{ for all courses in the semester with Letter grades, including F}}$$

**Cumulative Grade Point Average (CGPA):**

It is a measure of the overall performance of the student for the entire program

**Cumulative Grade Point Average (CGPA) is computed as follows:**

$$\text{CGPA} = \frac{\sum [(\text{course credit}) \times (\text{Grade point})] \text{ for all courses for all semesters with, Letter grades excluding F}}{\sum [(\text{course credits})] \text{ for all courses for all semesters with Letter grades, excluding F}}$$

**Conversion of Grades into Percentage:**

Formula for conversion of GPA into percentage: **CGPA earned X 10 = Percentage of marks scored**

Illustration: (CGPA Earned 8.18 X 10) = 81.80 %

### Award of Class:

The candidate, who has passed all the courses prescribed, shall be declared to have passed the program. Class will be awarded only to those who pass the entire examination in the first attempt and on the basis of the aggregate of marks scored in individual semester.

A candidate shall be considered to have completed a course successfully and earned the credits assigned, if he secures an acceptable letter grade in the range O-C. Letter grade „F“ in any course implies failure in that course and no credit is earned.

A candidate having satisfactory attendance at classes and meeting the passing standard at CIE in a course, but remained absent from SEE shall be awarded „I“ grade in that course.

A candidate who secures  $GPA \geq 7.00$  and above in first attempt shall be declared to have passed in „First Class with Distinction“.

A candidate who secures  $GPA \geq 6.00$  or more but less than 7.00 in the first attempt shall be declared to have passed in „First Class“.

A candidate who secures  $GPA \geq 5.00$  or more but less than 6.00 in the first attempt shall be declared to have passed in „Second Class“.

A candidate who secures  $GPA \geq 4.00$  or more but less than 5.00 in the first attempt shall be declared to have passed in „Pass Class“.

Candidates who pass the examinations in more than one attempt shall be declared as passed in „Pass“ class irrespective of the percentage of marks secured.

An attempt means the appearance of a candidate for one or more courses either

in part or full in a particular examination. If a candidate submits application for appearing for the examination but does not appear for any of the courses either in full or part in the university examination, he can appear for supplementary examination provided other conditions such as attendance requirement, internal assessment marks, etc are fulfilled and his appearing in the supplementary examination shall be considered as the first attempt.

Candidates who pass the subjects in the supplementary examinations are not eligible for the award of Gold Medal or Merit Certificate

### **Carry Over Benefit:**

A candidate shall appear for all the subjects of that particular semester in the University examinations but failed in that semester can avail this benefit provided:

A candidate who fails in I semester is allowed to move to II semester. The candidates with backlog subjects shall take both I semester backlog papers as well as II semester papers. Candidate with a backlog of not more than 2 papers in I & II semester put together is allowed to go to the III semester.

Candidates who have failed in not more than 2 subjects of II semester and III semester (put together) and not having backlog of I semester papers are only permitted to go to IV semester.

The candidate is permitted to appear for the IV semester examination along with the backlog subjects of II and III semesters and should pass all the subjects, including the backlog subjects to be declared as having completed the course.

However, a candidate should pass all the lower semester papers before the announcement of final semester results.

### **Supplementary Examinations:**

Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. Lower semester examinations shall be conducted by the University along with current semester examinations for the benefit of unsuccessful candidates.

A candidate detained for lack of attendance will be barred from appearing in any one or all course/s for the supplementary examination.

A candidate permitted to appear for the supplementary examination can improve his internal assessment marks before he takes the supplementary examination by subjecting himself to internal assessment.





























