

**Gopal Narayan Singh University**  
**Jamuhar, Sasaram, Rohtas (Bihar)**  
**Faculty of Allied and Healthcare Sciences**



**ORDINANCES AND SYLLABUS GOVERNING TO**  
**04 YEARS (03 YEARS + 01 YEAR INTERNSHIP)**  
**BACHELOR OF ANAESTHESIA AND**  
**OPERATION THEATRE TECHNOLOGY (BAOTT)**  
**PROGRAMME**

As per

**National Commission for Allied and Healthcare Professions Curriculum -**  
**2025,**

**Ministry of Health and Family Welfare,**  
**Government of India**

**2025, V. 2.0**

*Mansj Kumar*

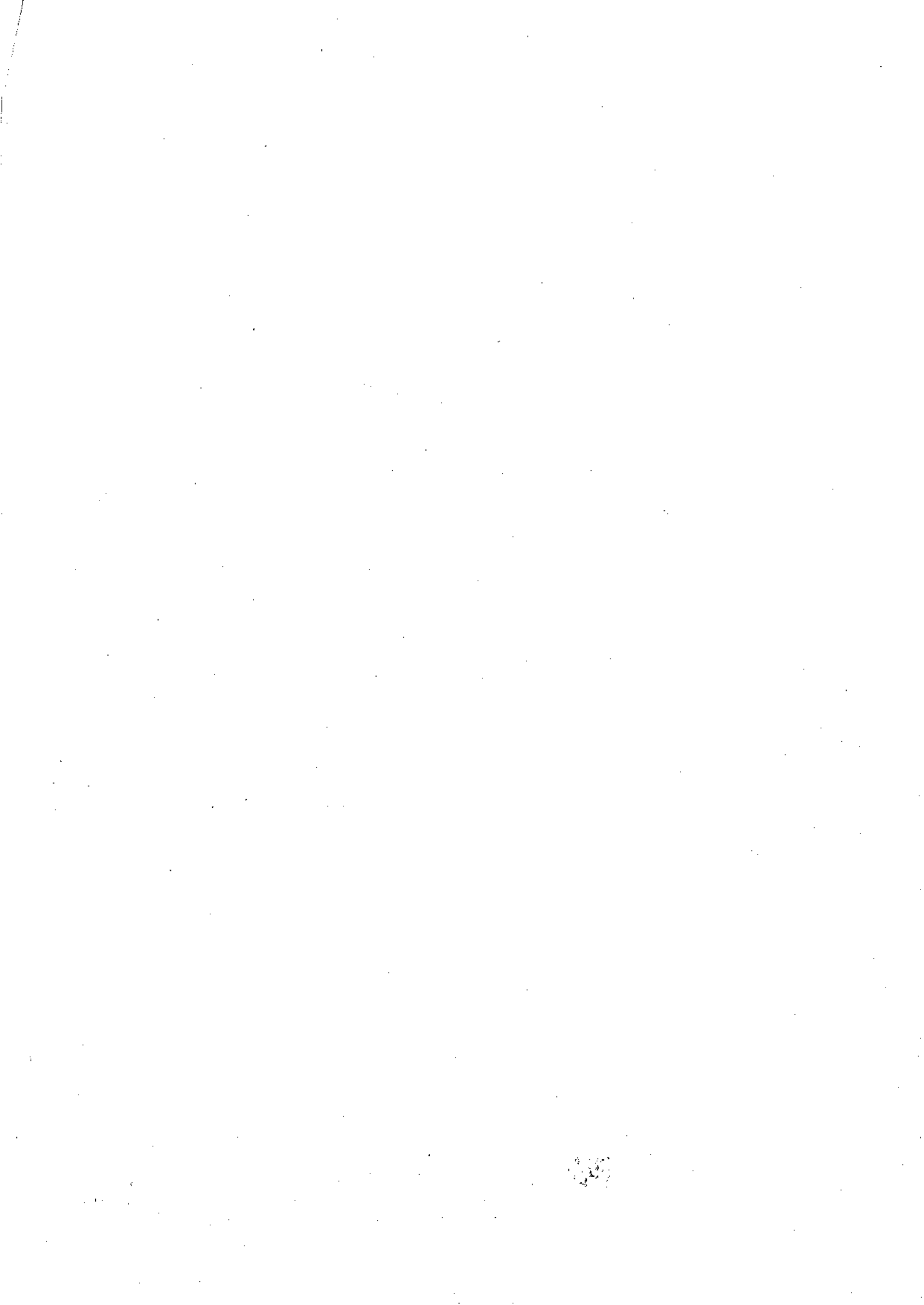
*Ankit*  
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**BACHELOR OF ANAESTHESIA &  
OPERATION THEATRE TECHNOLOGY  
(B. AOTT)  
2026**

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**Introduction:**

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

- Able to help the anesthesiologist in administering Anaesthesia, 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 Anaesthesia 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, peri-operative 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 Anaesthesia 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 health care 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

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## 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
4. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.
5. Admission to Bachelor of Anaesthesia & Operation Theatre Technology course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.
  - a. Entrance test, to be conducted by the university as per the syllabus under 10 +2 scheme of CBSE, subject-wise distribution of questions will be as 25% in Physics, 25% in Biology, 25% in Chemistry, 15% in English (Language & Comprehension) and 10% in General Awareness about health related methods.
  - b. Successful candidates on the basis of written Test will be called for the interview & shall have to face an interview board. The interview board will include the Head of the Department of Surgery and/or Anaesthesia (Chairman of the Board) along with other nominees, whose recommendations shall be final for the selection of the students.
  - c. During subsequent counseling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.

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- d. Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.
- e. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice.

### **Provision of Lateral Entry:**

Lateral entry to second year for allied and healthcare science courses for candidates who have passed diploma program from the Government Boards and recognized by State/Central University, fulfilling the conditions specified and these students are eligible to take admission on lateral entry system only if the same subject have been studied at diploma level.

**Number of intake:** lateral entry admission must not be more than 20% of the annual intake.

A candidate with a minimum 2 years full-time diploma in Anaesthesia & Operation Theatre Technology recognized by a Government Body is eligible for lateral entry to the 3<sup>rd</sup> semester of Baccalaureate in Anaesthesia & Operation Theatre Technology.

**Note:** Candidates with minimum 2 years full-time diploma in Anaesthesia & Operation Theatre Technology from a recognized Government Body shall have passed „plus-two“ [10+2] with Physics, Chemistry and Biology as subjects.

### **Eligibility of the lateral candidates based on examination conducted by NCAHP.**

Foreign nationals and candidates who have qualified from a foreign University/Board should obtain permission from the NCAHP commission prior to the admission for equivalence of the qualification.

### **Duration of the course**

Duration of the course: 4 years or 8 semesters (3 Year + 1 Year Internship).

Maximum period for completion of the course:

- The maximum period for completion of BAOTT is 6 years.
- If a candidate does not complete within the 6years, he/she should re-register.

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**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.

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e) Anaesthesia Equipment:

- Anaesthesia machines.
- Monitors for vital signs and Anaesthesia 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.
- Case Studies and Scenarios:

j) 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.

Method of teaching and learning-

- Lecture
- Tutorial
- Problem based learning
- Small group teaching and learning

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- Continuous interactive learning
- Case-based
- Project based
- Research project- Research was considered by the group to be very important in order to keep pace with other professions and to generate a research background for our own profession.
- Seminars
- Clinical conferences
- E-learning
- Skills laboratory
- Industrial visit

### 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 20 % for CIE and 80 % for ESE.

Continuous Internal Evaluation (CIE)

Best of two internal tests will be applicable.

#### NIAHS Eligibility for Promotion

- Students shall be eligible for promotion to the next semester even if they fail course/s i.e. up to last semester. A theory or practical shall be treated as a separate head (paper).
- The Re-appear examination of even semesters shall be conducted with the end-semester examinations of even semesters and similarly examinations of odd semesters shall be conducted with the end-semester examinations of next odd batch.
- The final CGPA shall be awarded only after successful completion of all courses from first semester to last semester within the maximum duration prescribed in this ordinance.

Note: *Those candidates declared to have passed in all semester including final semester examinations in all courses/subjects will be eligible for internship/externship.*

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**End semester examination (ESE)**

- a. There shall be a University Examination at the end of each semester.
- b. To be eligible to appear for University examination a candidate should fulfill all the following conditions
  - i. Undergone satisfactorily the approved program of study in the course/courses for the prescribed duration
  - ii. 75% attendance separately in theory and in practical/hospital postings, in each course
  - iii. Shall have the minimum attendance requirement in all courses of that semester for the first appearance
  - iv. Secure at least 50% of total marks fixed for CIE in a particular course; and
  - v. Fulfill any other requirement that may be prescribed by the University from time to time.
- c. The End semester examination will consist of Theory examination for all courses and in addition, Practical examination for specified courses.
- d. Theory examination
  - i. Written tests with question types, pattern, duration and weightage as specified in the Course-wise curricula
  - ii. Setting of question papers and evaluation of answer scripts as per University regulations
- e. Practical examination
  - i. Broad outline would be in the form of Spotters, Demonstration of equipment handling, Case based discussions.

**Question Paper Pattern**

## Theory Paper

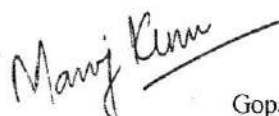
A. Duration- 3 Hours

Total Marks- 80

MCQ- 10X1= 10

Short Answer- 8X5=40 (Any 8 Out Of 10)

Long Answer- 10X3= 30 ( Any 3 Out Of 4)



For Practical Examination:-

Viva,

Demonstration & Spotting.

**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.

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PEO No.	Programme Educational Outcome
PEO1	<b>Senior Clinical Roles &amp; Administrative Leadership:</b> Graduates secure stable employment and advance to high-ranking professional roles such as Senior OT Technologists, Anaesthesia Technical Officers, or Operating Theatre Managers successfully leading technical teams in government and corporate healthcare sectors.
PEO2	<b>Industry Specialization &amp; Corporate Placement:</b> Graduates diversify into competitive career paths within the healthcare industry, serving as application specialists, clinical technical trainers, or consultants for medical device manufacturers, pharmaceutical firms, and super-specialty trauma units.
PEO3	<b>Academic Excellence &amp; Healthcare Innovation:</b> Graduates build successful careers in academia and clinical research, serving as faculty members in Allied Health Care Sciences, clinical instructors, or technical leaders driving the integration of emerging technologies like AI and robotics into surgical practice.

PO No.	Programme Outcome
PO1	Demonstrate thorough knowledge of basic medical sciences, anaesthesia technology, operation theatre management, and perioperative patient care.
PO2	Apply clinical and technical skills proficiently in anaesthesia assistance, operation theatre procedures, patient monitoring, and critical care support.
PO3	Develop, implement, and evaluate standard operating procedures (SOPs), clinical protocols, and quality assurance measures in operation theatre and anaesthesia services.
PO4	Perform clinical procedures, investigate perioperative challenges, and utilize evidence-based approaches to support patient care and healthcare decision-making.
PO5	Utilize modern healthcare technologies, medical equipment, information systems, and advanced techniques relevant to anaesthesia and operation theatre practice.
PO6	Assess and address societal healthcare needs while ensuring patient safety, quality care, and community well-being through professional practice.
PO7	Apply principles of environmental protection, infection control, biomedical waste management, and sustainable healthcare practices in clinical settings.
PO8	Uphold ethical principles, professional integrity, legal responsibilities, and respect for patient rights and confidentiality in healthcare practice.
PO9	Function effectively as an individual, team member, and leader within multidisciplinary healthcare teams to achieve common patient care goals.
PO10	Communicate effectively with patients, caregivers, healthcare professionals, and stakeholders using appropriate verbal, written, and digital communication skills.

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PO11	Apply scientific, managerial, and financial principles in planning, organizing, and managing healthcare projects, resources, and operation theatre services.
PO12	Engage in lifelong learning, continuing professional development, research activities, and adaptation to advancements in anaesthesia and healthcare technologies.

PSO No.	Programme Specific Outcome
PSO1	Demonstrate competency in assisting anaesthesiologists during pre-operative, intra-operative, and post-operative anaesthesia procedures while ensuring patient safety and quality care.
PSO2	Operate, maintain, and troubleshoot anaesthesia machines, ventilators, patient monitoring systems, and other operation theatre equipment according to established standards and protocols.
PSO3	Apply aseptic techniques, infection control measures, sterilization procedures, and operation theatre management practices to ensure a safe surgical environment.
PSO4	Participate effectively in emergency, trauma, and critical care situations by utilizing clinical skills, professional ethics, teamwork, and evidence-based practices in perioperative healthcare settings.

### PO -PEO mapping Matrix

Program Outcomes (POs)	PEO 1	PEO 2	PEO 3
PO1	3	2	-
PO2	3	3	-
PO3	2	2	2
PO4	2	-	3
PO5	2	3	2
PO6	3	3	2
PO7	2	2	1
PO8	-	3	2
PO9	2	-	3
PO10	1	-	3
PO11	2	2	2
PO12	-	2	3

### Teaching and Examination Pattern

Here is a proposed teaching and examination pattern for the Bachelor of 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)

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## Credit Summary of Courses Offered for BAOTT

Semester	Core Courses	Practical / Clinical Credits	Skill Enhancement / Internship	Total Credits
I	19	4	-	23
II	22	3	-	25
III	20	4	-	24
IV	20	6	-	26
V	18	6	-	24
VI	21	6	-	27
VII	-	24	Internship	24
VIII	-	24	Internship	24
<b>Total (Semester I-VI)</b>	<b>120</b>	<b>77</b>	<b>-</b>	<b>197</b>

## Credit Distribution

Category	Credits	Percentage
Core Theory Courses	120	80.5%
Practical / Skill-Based Courses	29	19.5%
Internship (1 Year)	Mandatory	University Requirement
<b>Total Academic Credits</b>	<b>197</b>	<b>100%</b>

## Graphical Summary

- **Core Theory Courses:** 80.5%
- **Practical & Skill-Oriented Courses:** 19.5%
- **Internship:** 1 Year compulsory clinical training



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## FIRST SEMESTER

Course Code	Course Title	Credit		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-101	Introduction To Healthcare Delivery System in India	2	-	80	20	100	-	-	-	100
BAOTT-102	Medical Terminology & Record Keeping	3	-	80	20	100	-	-	-	100
BAOTT-103	Anatomy	6	2	80	20	100	40	10	50	150
BAOTT-104	Physiology	6	2	80	20	100	40	10	50	150
BAOTT-105	Healthcare Quality & Patient Safety	2	-	80	20	100	-	-	-	100
<b>Total</b>		<b>19</b>	<b>4</b>	<b>400</b>	<b>100</b>	<b>500</b>	<b>80</b>	<b>20</b>	<b>100</b>	<b>600</b>

## SECOND SEMESTER

Course Code	Course Title	Credit		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-201	Medical Law & Ethics, Principles of Management	4	-	80	20	100	-	-	-	100
BAOTT-202	Basics of Biomedical Sciences in Surgery & Anaesthesia	4	2	80	20	100	-	-	-	100
BAOTT-203	Biochemistry & Hematology	4	1	80	20	100	-	-	-	100
BAOTT-204	Pathology & Microbiology	4	-	80	20	100	-	-	-	100
BAOTT-205	Basic Concept in Pharmacology	3	-	80	20	100	-	-	-	100
BAOTT-206	Basic Computer & Information Sciences, communication & Soft Skills	3	-	80	20	100	-	-	-	100
<b>Total</b>		<b>22</b>	<b>3</b>	<b>480</b>	<b>120</b>	<b>600</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>600</b>

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## THIRD SEMESTER

Course Code	Course Title	CR		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-301	Basic Techniques of Anaesthesia	6	2	80	20	100	40	10	50	150
BAOTT-302	Basics of Surgical Procedures	6	2	80	20	100	40	10	50	150
BAOTT-303	CSSD & Manifold area	4	-	80	20	100	-	-	-	100
BAOTT-304	Industrial Orientation & Industrial Visit	4	-	80	20	100	-	-	-	100
Total		20	4	320	80	600				600

## FOURTH SEMESTER

Course Code	Course Title	CR		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-401	Advance Anaesthesia Techniques	6	2	80	20	100	40	10	50	150
BAOTT-402	Advanced Surgical Procedures	6	2	80	20	100	40	10	50	150
BAOTT-403	Basic Intensive Care	4	2	80	20	100	40	10	50	150
BAOTT-404	Clinical Medicine & Management	4	-	80	20	100	-	-	-	100
Total		20	6	320	80	400	-	-	-	550



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### FIFTH SEMESTER

Course Code	Course Title	CR		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-501	Specialized Anaesthesia	6	2	80	20	100	40	10	50	150
BAOTT-502	Specialized Surgery	6	2	80	20	100	40	10	50	150
BAOTT-503	Recent Advances in Anaesthesia & Surgical Field	4	2	80	20	100	-	-	-	100
BAOTT-504	Disaster Management & Environmental Science	2	-	80	20	100	-	-	-	100
Total		18	6	320	80	400				500

### SIXTH SEMESTER

Course Code	Course Title	CR		Theory			Practical			Total (Marks)
		T	P	SEE	IA	T	SEE	IA	T	
BAOTT-601	Specialized Anaesthesia-2	6	2	80	20	100	40	10	50	150
BAOTT-602	Specialized Surgery-2	6	2	80	20	100	40	10	50	150
BAOTT-603	Specialized Anaesthesia and Surgical-3	6	2	80	20	100	40	10	50	150
BAOTT-604	Disaster Management & Environmental Science	3	-	80	20	100	-	-	-	100
Total		21	6	320	80	400	-	-	-	550

### SEVENTH AND EIGHTH SEMESTER

Course Code	Course Title	Time Period	CR
BAOTT-701	B.AOTT Internship (Anaesthesia, Surgery, Specialties)	One Year	48

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## First Semester- Foundation course

### BAOTT-101: Introduction to Healthcare Delivery System in India.

#### Learning Objectives:-

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.

#### Course Outcomes:

- CO1:-** Student will have thorough knowledge of healthcare delivery system in India that will help to analyse the scenario.
- CO2:-** Student will have understood about government policies and they implement in their working place.
- CO3:-** Students will have ability to differentiate amongst the AYUSH System and how they work.
- CO4:-** Students will have use modern tools for explain demographic situations of Health sciences in India.
- CO5:-** Student will analyze the healthcare system with respect of Epidemiology.
- CO6:-** Graduates will able to generate daily log book for patients for better treatment and diagnosis.



#### Course Contents:-

##### 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:

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- Introduction to healthcare delivery system
  - 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
- National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.
- Introduction to AYUSH system of medicine.
  - a) Introduction to Ayurveda.
  - b) Yoga and Naturopathy
  - c) Unani
  - d) Siddha
  - e) Homeopathy
  - f) Need for integration of various system of medicine
- Health scenario of India- Past, present, and future Demography & Vital Statistics-
  - 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
- Epidemiology
  - 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.

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References Books:-

1. Park's Textbook of Preventive and Social Medicine
2. Textbook of Community Medicine: Preventive and Social Medicine
3. Introduction to AYUSH Systems of Medicine
4. Principles of Population Studies
5. National Health Policy 2017 & National Health Mission Operational Guidelines

CO-PO Mapping:-

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	2	-	3	-	-	-	1	-	2
CO2	2	-	1	2	-	3	-	2	-	1	1	2
CO3	2	-	-	1	-	2	-	-	-	1	-	2
CO4	1	1	-	2	3	2	-	-	-	1	1	2
CO5	3	1	-	3	2	3	1	-	-	1	-	2
CO6	1	2	2	1	2	1	-	2	1	2	2	1

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## **BAOTT-102: Medical Terminology and Record keeping (including anatomical terms)**

### **Learning Objectives:-**

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.

### **Course Outcomes:**

- CO1: Remember** fundamental word roots, prefixes, suffixes, and basic medical terms used in healthcare.
- CO2: Understand** the derivation of medical terms and the linguistic conventions for combining morphemes and forming plurals.
- CO3: Apply** complex medical terms by accurately combining roots, prefixes, and suffixes to describe clinical conditions.
- CO4: Analyze** medical abbreviations, symbols, and diagnostic/procedural terms across the major body systems (Integumentary to Endocrine).
- CO5: Evaluate** the clinical data presented within medical orders and healthcare reports.
- CO6: Create** accurate data entry and medical records within an Electronic Health Record (EHR) system.

### **Course Contents:**

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.
4. Basic medical terms.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.
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.

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**References Books:-**

1. Medical Terminology: A Short Course by *Davi-Ellen Chabner*
2. The Language of Medicine by *Davi-Ellen Chabner*
3. Medical Terminology for Health Professions by *Ann Ehrlich and Carol L. Schroeder*
4. Medical Records Manual: A Guide for Developing Countries by *World Health Organization (WHO)*
5. Essentials of Health Information Management: Principles and Practices by *Mary Jo Bowie*

**CO-PO Mapping:-**

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	2	-	3	-	-	-	1	-	2
CO2	2	-	1	2	-	3	-	2	-	1	1	2
CO3	2	-	1	-	2	-	-	-	1	-	1	-
CO4	1	1	-	2	3	2	-	-	1	1	1	2
CO5	3	1	-	3	2	3	1	-	-	1	-	2
CO6	1	2	2	1	3	1	-	2	1	2	2	1

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## BAOTT-103: Anatomy

### Learning Objectives

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.

### Course Outcome:

- CO1: Remember** basic anatomical terminology, names of specific bones (osteology of upper limb, lower limb, thorax, vertebral column), and major organs of the human body.
- CO2: Understand** the structure and function of the digestive system, gastrointestinal tract, and nervous system (including central, peripheral, cranial, and spinal nerve divisions).
- CO3: Apply** principles of surface anatomy and musculoskeletal parameters (origin, insertion, and action of flexor/extensor groups) during physical examinations or clinical positioning.
- CO4: Analyze** the relationships between anatomical structures across distinct physiological systems, including the cardiovascular (heart chambers, valves, major vessels), respiratory (trachea, bronchial tree, lungs), and excretory (kidneys, ureters, bladder) systems.
- CO5: Evaluate** normal organ anatomy, bony features, and structural boundaries during practical mannequin identifications and basic radiological assessments, such as a Chest PA view X-ray.
- CO6: Create** a comprehensive system-by-system mapping or identification guide that integrates gross structural anatomy with practical clinical observations (surface markings, organ positions, and prominent bone attachments).

### Course Contents:-

Basic anatomy

1. Introduction to Anatomy: Basic Anatomical terminology

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- a) Osteology-
  - Upper limb – clavicle, scapula, humerus, radius, ulna,
  - Lower limb - femur, hipbone, sacrum, tibia, fibula & Vertebral column
- b) Thorax – Intercostal space, pleura, bony thoracic cage, ribs sternum & thoracic vertebrae
- c) Lungs – Trachea, bronchial tree.
2. Heart – Surface anatomy of heart, chambers of the heart, valves of the heart, and major blood vessels of heart, pericardium, and coronary arteries -
3. Skeleton-muscular system – Muscles of thorax, muscles of upper limb (arm & fore arm) Flexor and extensor group of muscles (origin, insertion, action)
4. Excretory system – Kidneys, ureters, bladder.
5. Digestive System:
  - a. Structure and function of the digestive system Oral cavity and digestive enzymes.
  - b. Anatomy and function of the gastrointestinal tract
  - c. Absorption and digestion of nutrients
  - d. Common digestive disorders
6. Nervous System:
  - a. Structure and function of neurons
  - b. Organization of the central nervous system (brain and spinal cord)
  - c. Peripheral nervous system and its divisions
  - d. Cranial nerves and spinal nerves
  - e. Basic principles of neurophysiology

### Practical in Anatomy:-

1. Mannequins to be provided for Teaching Osteology.
2. Bones identification (right and left side) and prominent features and muscle.
3. 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.

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 Sumit Singh



**Reference Books:-**

1. BD Chaurasia's Human Anatomy (Regional and Applied: Dissection and Clinical) – Vols. 1, 2, & 3
2. Textbook of Anatomy by Inderbir Singh
3. Gray's Anatomy for Students by Richard Drake, A. Wayne Vogl, and Adam W. M. Mitchell
4. Principles of Anatomy and Physiology by Gerard J. Tortora and Bryan H. Derrickson
5. Human Anatomy by Ross & Wilson (Anatomy and Physiology in Health and Illness)

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	1	-	1	-	-	-	-	-	2
CO2	3	2	-	1	-	-	-	-	-	-	-	2
CO3)	3	2	-	2	-	1	-	-	-	-	-	2
CO4	3	2	-	2	-	-	-	-	-	-	-	2
CO5	3	3	2	3	2	2	1	1	2	2	-	3
CO6	2	3	1	2	3	-	2	-	2	1	-	2

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## BAOTT-104: Physiology

### Learning Objectives

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.

### Course Outcome:

- CO1: Remember** standard physiological baselines, definitions, and normal values for hematological, cardiovascular, and respiratory parameters.
- CO2: Understand** the fundamental structures, compositions, and functional mechanisms regulating blood, gas exchange, cardiac cycles, and reproduction.
- CO3: Apply** clinical measurement protocols for monitoring blood pressure, urine volume, and renal specific gravity during patient assessments.
- CO4: Analyze** variations in electrocardiograms, blood clotting cascades, and red blood cell pathologies to identify systemic dysfunction.
- CO5: Evaluate** complex renal function tests, glomerular filtration rates, and fluid-electrolyte handling profiles to judge patient homeostatic status.
- CO6: Create** a systemic assessment model correlating cellular acid-base disturbances with cardiovascular, respiratory, and renal compensatory pathways.

### Course Contents

#### 1. The Cell:

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

#### 2. The Blood:

- 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.

3. Cardio-Vascular System:

- 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.)

4. Respiratory system:

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

5. Excretory system:

- 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 of pH.

6. Reproductive system:

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

7. Central Nervous system:

a) Functions of CSF.

8. Endocrine system:

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

9. Digestive system:

- 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.

10. Special Senses:

- a) Vision testing and assessment of visual acuity
- b) Auditory tests and assessment of hearing function
- c) Study of taste and olfaction perception
- d) Analysis of vestibular system and balance control
- e) Assessment of proprioception and kinesthetic sense

**Practical in Physiology**

- 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.



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- e) Examination of Respiratory system to count respiratory rate and measure inspiration and respiration.

**Reference Books:-**

1. Guyton and Hall Textbook of Medical Physiology by *John E. Hall and Michael E. Hall* – Vols. 1 & 2
2. Ganong's Review of Medical Physiology by *Kim E. Barrett, Susan M. Barman, Jason X.-J. Yuan, and Heddwen L. Brooks*
3. Berne & Levy Physiology by *Bruce M. Koeppen and Bruce A. Stanton*
4. Human Physiology: An Integrated Approach by *Dee Unglaub Silverthorn*
5. Essentials of Medical Physiology by *K Sembulingam and Prema Sembulingam*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	-	1	-	-	-	-	-	2
CO2	3	3	1	2	-	1	-	-	-	-	-	2
CO3	3	3	1	3	2	1	-	-	-	-	-	2
CO4	3	3	1	3	2	1	-	-	-	-	-	2
CO5	3	2	-	2	-	1	-	-	-	-	-	2
CO6	2	3	2	3	3	1	2	1	2	2	-	3

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## BAOTT-105: Health Care Quality & Patient Safety

### Learning Objectives

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.

### Course Outcomes:

- CO1: Remember** the fundamental core concepts, components, and accreditation guidelines (NABH and JCI) for hospital infection control programs.
- CO2: Understand** the clinical mechanisms underlying sudden cardiac arrest, heart attack, stroke, choking, and the primary pathways of healthcare-associated infections.
- CO3: Apply** evidence-based infection control practices including sterilization, disinfection, strict hand hygiene, and the proper utilization of Personal Protective Equipment (PPE).
- CO4: Analyze** patient vital signs and initial clinical presentations during primary assessments to execute rapid medical triage and immediate recognition of emergencies.
- CO5: Evaluate** emergency scenarios to safely coordinate team-based interventions, including moving a patient safely and executing one- and two-rescuer CPR.
- CO6: Create** an integrated emergency response and airway management workflow utilizing automated external defibrillators (AEDs), rescue breathing methods, and bag-valve-masks (BVMs) within simulated lab conditions.

### Course Contents:

#### UNIT-1: Basics of emergency care and life support skills.

- 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

**UNIT-2: Infection prevention and control.**

- 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.**

- 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.**

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

**Reference Books:-**

1. AHA Basic Life Support (BLS) Provider Manual by *American Heart Association*
2. First Aid Manual by *St John Ambulance, St Andrew's First Aid, and British Red Cross*

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3. Infection Prevention and Control in Healthcare, Part I & II by *World Health Organization (WHO)*
4. Hospital Epidemiology and Infection Control by *Glen Mayhall*
5. NABH Guide to Accreditation and Quality Enhancement by *National Accreditation Board for Hospitals & Healthcare Providers*

CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	3	-	-	3	2	2	-	1	3	2
CO2	2	2	2	-	-	2	3	2	-	-	-	1
CO3	2	3	2	2	2	3	-	1	3	2	-	2
CO4	3	2	2	3	-	2	2	-	-	-	-	2
CO5	3	3	2	3	-	2	1	-	-	-	-	2
CO6	3	2	1	3	2	1	1	-	-	-	-	3

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## SECOND SEMESTER

### BAOTT-201: Medical Law and Ethics, Professionalism & Values, Principles of Management

#### Learning Objectives

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.

#### Course Outcome:

- CO1: Remember** the formal definitions, goal, scope, and core terminology of medical ethics, code of conduct, and professional indemnity insurance policies.
- CO2: Understand** the basic principles of medical ethics, including patient autonomy, confidentiality, right of patients, and the legalities surrounding organ transplantation.
- CO3: Apply** standard administrative protocols for obtaining an informed consent, managing unauthorized disclosure, and handling the release of medical information.
- CO4: Analyze** the legal boundaries distinguishing rational drug therapy from malpractice and negligence, as well as the types of documentation required for medico-legal cases (MLC).
- CO5: Evaluate** complex bioethical dilemmas encountered in daily practice, such as the care of the terminally ill, euthanasia, and the ownership or retention of medical records.
- CO6: Create** a standardized, proactive clinical protocol designed to systematically avoid near misses, reduce sentinel events, and protect privileged communication at the bedside.

#### Course Contents:-

##### Medical law and ethics

- a) Medical ethics – Definition, Goal, Scope

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- 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.**

- a) Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality
- b) Personal values- ethical or moral values
- c) Attitude and behavior- professional behavior, treating people equally.
- d) Code of conduct, professional accountability and responsibility, misconduct
- e) Differences between professions and importance of team efforts
- f) Cultural issues in the healthcare environment

**Principles of management:**



- a) Development of Management: Definitions of Management , Contributions of F.W. Taylor, Henry Fayol, and others.
- b) Functions of Management: Planning , Organizing , Directing
- c) 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.

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- d) Organizing: Importance of organization, Hierarchy, Scalar chain , Organization relationship, Line relationship , Staff relationship, Line staff relationship , Functional relationship, Committee organization, Management committees, Departmentation.
- e) Motivation: Motivation theories
  - a) McGregor's theory X and theory Y
  - b) Maslow's and Herzberg's theory
  - c) Porter and Lawler model of complex view of motivation
  - d) Other theories.
  - e) Diagnostic signs of motivational problems
  - f) Motivational Techniques.
- f) Communication: Types of communication, Barriers of effective communication, Techniques for improved communication.
- g) Directing: Principles relating to Direction process.
- h) Principles and theories of leadership, Leadership Style, 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.
- i) Co-ordination: Co-ordination and co-operation, Principles of co-ordination , Techniques of co-ordination charts and records , Standard procedure instructions.
- j) Acts: CPA Act (1986 & 2019), BMW Act (1998,2016), Drugs Act(1940), IMC Act(1956), Patient Privacy – IT Rules, 2011
- k) Medical Malpractice sections: - 304A, 337 and IPC 1860.

**Personnel management:**

- a) Objective of Personnel Management
- b) Role of Personnel Manager in an Organization
- c) Staffing and Work Distribution Techniques
- d) Job Analysis and Job Description
- e) Recruitment and Selection Processes
- f) Orientation and Training
- g) Coaching and Counseling
- h) Disciplining
- i) Complaints and Grievances
- j) Termination of Employees
- k) Performance Appraisal

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- l) Health and Safety of Employees
- m) Consumer Protection Act as Applicable to Health Care Services

**Financial management:**

- a. Definition of Financial Management
- b. Profit Maximization
- c. Return Maximization
- d. Wealth Maximization
- e. Short-term Financing
- f. Intermediate Financing
- g. Long-term Financing
- h. Leasing as a Source of Finance
- i. Cash and Security Management
- j. Inventory Management
- k. Dividend Policies
- l. Valuation of Shares
- m. Financial Management in a Hospital
- n. Third-party Payments on Behalf of Patients
- o. Insurance
- p. Health Schemes and Policies

**Reference Books:-**

1. Medical Law and Ethics by *Shaun D. Pattinson*
2. Principles of Biomedical Ethics by *Tom L. Beauchamp and James F. Childress*
3. Medical Law and Ethics in India by *B. Sandeep Bhat*
4. Law and Medicine by *Dr. Lily Srivastava*
5. Professionalism in Health Care: A Guide for Career Success by *Sherry Makely*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	2	-	-	2	-	3	-	-	-	2
CO2	1	1	2	2	-	2	-	3	-	2	-	1
CO3	1	-	2	2	-	3	-	3	-	-	-	2
CO4	-	-	-	-	-	2	-	3	3	3	-	2
CO5	-	-	2	-	1	2	-	-	2	3	3	2
CO6	-	-	1	-	1	-	-	-	2	1	3	2

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## **BAOTT-202: Basics of Biomedical sciences in surgery and Anaesthesia**

### **Learning Objectives**

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.

### **Course Outcome:**

- CO1: Remember** the components and basic principles of biomedical instrumentation, navigation systems, and Anaesthesia machines.
- CO2: Understand** the physical laws and technologies behind surgical imaging, physiological transducers, and gas monitors.
- CO3: Apply** image processing, tracking, and registration techniques for surgical planning and intraoperative guidance.
- CO4: Analyze** parameter readouts and operating mechanics of specialized laparoscopic, electrosurgical, and optical devices.
- CO5: Evaluate** advanced clinical technologies, including image-guided interventions and closed-loop Anaesthesia systems, for efficacy.
- CO6: Create** an integrated deployment plan that coordinates surgical, imaging, and Anaesthesia systems within an operating theatre.

### **Course Contents:-**

1. Introduction to Biomedical Engineering in Surgery and Anaesthesia.
2. Surgical and Anaesthesia 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, EtCO<sub>2</sub> monitor, Pulse oximeter, Blood pressure monitor.
3. Surgical Microscope.
4. Laparoscopic cart (including various scopes), Veress needle, Trocars, and various instruments.
5. Biomedical Imaging in Surgery and Anaesthesia.

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- a) Principles and technologies of medical imaging (e.g., X-ray, computed tomography, magnetic resonance imaging) Image-guided surgical procedures and interventions
  - b) Image processing and analysis techniques for surgical planning and intraoperative guidance
  - c) Advances in real-time imaging and its integration into surgical and Anaesthesia workflows
6. Surgical Navigation and Guidance Systems.
- a) Principles of surgical navigation systems and their applications
  - b) Use of imaging, tracking, and registration techniques in surgical navigation.
7. Anaesthesia Delivery and Monitoring.
- a) Anaesthesia machines and delivery systems
  - b) Design and development of Anaesthesia monitoring devices.
  - c) Physiological monitoring parameters and their interpretation during Anaesthesia
  - d) Advances in Anaesthesia technology, such as closed-loop Anaesthesia delivery systems.

**Reference Books:-**

1. Introduction to Biomedical Engineering by *John Enderle and Joseph Bronzino*
2. Medical Instrumentation: Application and Design by *John G. Webster and Amit J. Nimunkar*
3. Ward's Anaesthetic Equipment by *Andrew Davey and Ali Diba*
4. Principles of Medical Imaging by *K. Kirk Shung, Michael B. Smith, and Benjamin M. W. Tsui*
5. Understanding Anaesthesia Equipment by *Jerry A. Dorsch and Susan E. Dorsch*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	-	1	2	-	-	-	-	-	-	2
CO2	2	3	2	2	3	2	1	-	-	-	-	2
CO3	2	3	1	2	3	-	1	-	-	-	-	2
CO4	3	2	-	2	3	1	1	-	-	-	-	2

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CO5	2	2	-	3	3	-	-	-	1	-	-	3
CO6	3	3	2	3	3	2	1	1	2	-	-	3

### BAOTT-203 Biochemistry & Haematology

#### Course Outcome:

- CO1: Remember** the classifications, definitions, and standard values of biomolecules, enzymes, vitamins, minerals, and blood cell profiles.
- CO2: Understand** the metabolic pathways of macro-nutrients and the physiological mechanisms of blood coagulation and transfusion hazards.
- CO3: Apply** the Henderson-Hasselbalch equation and chemical concentration expressions to calculate and prepare precise laboratory solutions.
- CO4: Analyze** blood counts, coagulation profiles, and nutritional markers to identify disorders like anemia, thrombocytopenia, and Kwashiorkor.
- CO5: Evaluate** metabolic rates, dietary requirements, and blood cross-matching data to judge overall patient clinical and nutritional status.
- CO6: Create** a standard laboratory processing framework combining phlebotomy, blood typing, and complete blood count diagnostic procedures.

#### Course Contents:

#### Bio-chemistry

##### Unit 1

Distilled Water: Preparation, Types of Water distillation plant, Acids and bases-Definition, pH, Henderson – Hassel Balch equation, Buffers, Indicators, Normality, Molarity, Molality, Calculation & Preparation of Normality, Molarity, Molality solution

##### Unit 2

Carbohydrates: Classification, Glucose and Glycogen Metabolism, Gluconeogenesis, Glycogenesis, Kreb's Cycle, Oxidative Phosphorylation, Proteins: Classification of proteins and functions, Metabolism of Protein, Amino acids: Classification Lipids: Classification of lipids and functions, Fatty acid biosynthesis & fatty acid metabolism

##### Unit 3

Enzymes- Definition, Nomenclature, Classification, Factors affecting enzyme activity, Active site. Coenzyme, Enzyme Inhibition, Units of enzymes, Isoenzymes and Enzyme

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pattern in diseases, Vitamins: Fat soluble vitamins (A, D, E, K), water soluble vitamins, B complex vitamins, Hormones (Definition & Classification)

#### Unit 4

Minerals: Principal elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and Sulphur), trace elements, calorific value of foods, Basal Metabolic Rate (BMR), Respiratory Quotient (RQ), Specific Dynamic Action (SDA), balanced diet, Marasmus and Kwashiorkor

#### Hematology

- a) Hemoglobin, blood cell counts, differential count
- b) Anemia, polycythemia
- c) Thrombocytopenia
- d) Coagulation parameters- BT, CT, PT, INR, APTT
- e) Coagulation disorders.
- f) Blood transfusion-hazards and complications

#### Practical (Hematology)

- a) Phlebotomy
- b) CBC
- c) ABO Typing
- d) Cross Matching of blood( Forward and Reverse)

#### Reference Books:-

1. Textbook of Biochemistry for Medical Students by *DM Vasudevan, Sreekumari S, and Kannan Vaidyanathan*
2. Lehninger Principles of Biochemistry by *David L. Nelson and Michael M. Cox*
3. Essentials of Hematology by *Kawthalkar Shirish M*
4. Wintrobe's Clinical Hematology by *John P. Greer, Daniel A. Arber, Bertil Glader, List Robert T., Means William L., and Rodgers George M.*
5. Practical Haematology by *Sir John V. Dacie and S. M. Lewis*

#### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	-	-	1	-	-	-	-	2

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CO2	3	1	-	2	-	1	-	-	-	-	-	2
CO3	3	1	-	2	-	1	-	-	-	-	-	2
CO4	3	2	-	3	1	2	-	-	-	-	-	2
CO5	3	3	2	3	2	2	-	-	-	-	-	2
CO6	2	3	2	3	3	1	3	1	2	2	-	3

### BAOTT-204: Pathology & Microbiology

#### Learning Objectives

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.

#### Course Outcome:

- CO1: Remember** the definitions, nomenclature, and historical highlights of inflammation, neoplasia, and basic tissue pathology.
- CO2: Understand** the general principles of microbial pathogenesis, tumor biology, and cellular mechanisms of adaptation to stress.
- CO3: Apply** knowledge of environmental, occupational, and nutritional exposures to identify patient health risk factors.
- CO4: Analyze** the morphologic patterns, chemical mediators, and clinical features distinguishing acute versus chronic inflammation and benign versus malignant tumors.
- CO5: Evaluate** clinical presentations to differentiate reversible versus irreversible cell injury, necrosis, immune disorders, and coronary artery disease.
- CO6: Create** a diagnostic reference mapping cellular interactions and systemic structural progressions across diverse viral, bacterial, fungal, and parasitic infections.

#### Course Contents:-

##### Pathology

1. Cellular adaptation, Cell injury & cell death.

a) Introduction to cell pathology.

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- b) Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation.
- c) Causes of cell injury. Mechanisms of cell injury.
- d) Reversible and irreversible cell injury.
- e) Examples of cell injury and necrosis.

## 2. Inflammation.

- a) General features of inflammation Historical highlights
- b) Acute inflammation
- c) Chemical mediators of inflammation Outcomes of acute inflammation  
Morphologic patterns of acute inflammation Summary of acute inflammation
- d) Chronic inflammation

## 3. Immunity Disorders

### a) General Features of the Immune System

#### i. Disorders of the Immune System

### b) Infectious Diseases

- i. General Principles of Microbial Pathogenesis
- ii. Viral Infections
- iii. Bacterial Infections – Rheumatic Heart Disease
- iv. Fungal Infections
- v. Parasitic Infections

### c) Neoplasia

- i. Definitions and Nomenclature
- ii. Biology of Tumor Growth
- iii. Benign and Malignant Neoplasms
- iv. Epidemiology
- v. Carcinogenic Agents and Their Cellular Interactions
- vi. Clinical Features of Tumors

### d) Environmental and Nutritional Disorders

- i. Environmental and Disease
- ii. Common Environmental and Occupational Exposures
- iii. Nutrition and Disease
- iv. Coronary Artery Disease

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## Clinical Microbiology

- a) Morphology
  - i. Classification of microorganisms, size, shape and structure of bacteria.  
Use of microscope in the study of bacteria.
- b) Growth and nutrition.
  - i. Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.
- c) Culture media.
  - i. Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.
- d) Sterilization and Disinfection.
  - i. Principles and use of equipment of sterilization namely hot air oven, autoclave, and serum inspissator, pasteurization, antiseptic and disinfectants.
- e) Immunology.
  - i. Immunity, vaccines, types of vaccine and immunization schedule, principles, and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA.
  - ii. Rapid tests for HIV and HBsAg (excluding technical details).
- f) Systematic Bacteriology.
  - i. Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure, and pathogenicity),
  - ii. Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.

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g) Parasitology.

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

h) Mycology.

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

i) Virology.

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

**Reference Boks:-**

1. Robbins & Cotran Pathologic Basis of Disease by *Vinay Kumar, Abul K. As, and Jon C. Aster*
2. Harsh Mohan's Textbook of Pathology by *Harsh Mohan*
3. Robbins Basic Pathology by *Vinay Kumar, Abul K. Abbas, and Jon C. Aster*
4. Anderson's Pathology by *John M. Kissane*
5. Essentials of Pathology for Allied Health Sciences by *Ramadas Nayak and Rakshatha Nayak*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	-	2	-	1	-	-	-	-	-	2
CO2	3	1	-	2	-	1	-	-	-	-	-	2
CO3	3	2	-	2	-	2	-	-	-	-	-	2
CO4	3	2	1	3	-	2	2	-	-	-	-	2
CO5	3	1	-	2	-	2	1	-	-	-	-	2
CO6	2	3	2	3	3	1	3	-	1	1	-	3

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## BAOTT-205 Basic Concepts in Pharmacology

### Learning Objective

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

### Course Outcome:

- CO1: Remember** names, routes, and classifications of NSAIDs, sedatives, narcotics, anesthetics, and emergency drugs.
- CO2: Understand** the fundamental pharmacokinetic and pharmacodynamic principles regulating drug administration and action.
- CO3: Apply** correct calculation and dilution guidelines to prepare precise dosages of emergency and anesthetic drugs.
- CO4: Analyze** differences between drug classes, including depolarizing versus non-depolarizing relaxants and local versus inhalational gases.
- CO5: Evaluate** patient responses to select appropriate antiemetics, specific drug reversal agents, or vasoactive drug interventions.
- CO6: Create** a standardized medication administration protocol outlining precise drug dosages, dilutions, and safety checks for critical procedures.

### Course Contents:-

#### Clinical pharmacology

- a) Introduction to Pharmacology.
- b) Pharmacokinetic & Pharmacodynamics & routes of drugs administration
- c) NSAIDs Drugs.
- d) Ant sialagogues: Atropine, Glycopyrrolate.
- e) Sedatives / Anxiolytics: Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, and Tricolors.
- f) Narcotics: Morphine, Pethidine, Fentanyl, Pentazocine, tramadol.
- g) Antiemetic's: Metoclopramide, Ondansetron, Dexamethasone
- h) Induction Agent: Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate.

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- i) Muscle Relaxants: Depolarizing - Suxamethonium, Non depolarizing - Vecuronium, Atracurium, rocuronium.
- j) Inhalational Gases: Gases-O<sub>2</sub>, N<sub>2</sub>O, Air, Agents-Ether, Halothane, Isoflurane, Sevoflurane, Desflurane
- k) Reversal Agents: Neostigmine, Glycopyrrolate, Atropine, Naloxone, Flumazenil (Diazepam).
- l) Local Anesthetics: Xylocaine, Bupivacaine - Topical, Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine.
- m) Emergency Drugs : Mode or administration, dilution, dosage and effects
  - i. Adrenaline, Atropine
  - ii. Ephedrine, Mephentermine
  - iii. Bicarbonate, calcium, potassium.
  - iv. Inotropes: dopamine, dobutamine, amiodarone
  - v. Aminophylline, hydrocortisone, antihistaminic,
  - vi. Antihypertensive –Beta-blockers, Ca-channel blockers.
  - vii. Antiarrhythmic- xylocard
  - viii. Vasodilators- nitroglycerin & sodium nitroprusside
  - ix. Respiratory system- Bronchodilators
  - x. Renal system- Diuretics, frusemide, mannitol

#### Reference Books:-

1. Stoelting's Pharmacology & Physiology in Anesthetic Practice by *Pamela Flood, James P. Rathmell, and Steven Shafer*
2. Pharmacology for Anaesthesia and Intensive Care by *Tom E. Peck and Sue Hill*
3. Principles of Pharmacology for Medical Assisting by *Jane Rice*
4. Medical Pharmacology by *Padmaja Udaykumar*
5. Anaesthesia Pharmacology: Review of Principles and Practice by *Alex S. Evers, Mervyn Maze, and Evan D. Kharasch*

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CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	-	1	-	-	-	-	-	2
CO2	3	3	2	3	1	2	-	-	-	-	-	2
CO3	3	3	2	3	-	3	-	1	-	-	-	2
CO4	3	2	-	2	-	-	-	-	-	-	-	2
CO5	2	-	1	3	-	-	-	-	-	1	-	3
CO6	2	2	3	2	-	3	1	3	-	-	-	3

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## **BAOTT-206: Basic computers and information Science, Communication, and soft skills.**

### **Learning Objectives**

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.

### **Course Outcome:**

- CO1: Remember** names, generations, languages, types of hardware, operating systems, and network topologies.
- CO2: Understand** basic concepts of CPU memory, network architectures, internet applications, and clinical computer uses.
- CO3: Apply** Windows operations to open, close, move, resize, minimize, and manage files or folders.
- CO4: Analyze** input/output options, storage devices, and networking frameworks to optimize basic hardware and infrastructure setups.
- CO5: Evaluate** text layouts, spelling data, mail merge inputs, and chart formats for accuracy and presentation quality.
- CO6: Create** text documents files, data worksheets with graphs, and slideshow presentations using MS Word, Excel, and PowerPoint.

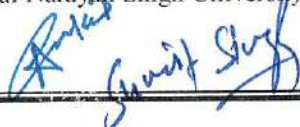
### **Course Contents:-**

#### **Basic computers and information science**

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:



- 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).
- 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.
- 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.
- 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.
- 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

- i. Learning to use MS office: MS word, MS PowerPoint, MS Excel.
- ii. To install different software.
- iii. Data entry efficiency

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## Practical Topics:

This would involve hands-on training in computer systems and software applications. This includes:

### Computer Fundamentals

- i. Computer hardware components and their functions
- ii. Input and output devices
- iii. Processor and memory management
- iv. Storage devices

### Operating Systems

Practical sessions can be conducted on operating systems such as MS Windows, with a focus on:

- i. Navigating the desktop
- ii. Managing files and folders
- iii. Working with windows and shortcuts

### MS Office Applications

Students should also gain proficiency in:

- i. MS Word for document creation and formatting
- ii. MS Excel for data entry and manipulation
- iii. MS PowerPoint for creating and delivering presentations

### Computer Networks and Internet Applications

- i. Computer networks
- ii. Email applications
- iii. File transfer
- iv. Web browsing

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## Communication and soft skills

Major topics to be covered under Communication course:

- a) Basic Language Skills: Grammar and Usage.
- b) Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.
- c) 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.
- d) Basic concepts & principles of good communication
- e) Special characteristics of health communication
- f) Types & process of communication
- g) Barriers of communication & how to overcome

### Practical in Communication & Soft Skills

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.

### Reference Books:-

1. Computer Fundamentals by *P.K. Sinha*
2. Introduction to Information Technology by *ITL Education Solutions Limited*

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3. Microsoft Office 2019 Step by Step by *Joan Lambert and Curtis Frye*
4. Computer Networks by *Andrew S. Tanenbaum and David J. Wetherall*
5. Introduction to Computers in Health Care by *M.J. Ball and K.J. Hannah*

CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	2	-	-	-	-	-	-	2
CO2	1	-	-	-	3	-	-	-	-	-	-	2
CO3	-	-	2	2	3	-	-	-	1	2	2	2
CO4	1	-	2	2	3	1	-	1	-	1	-	3
CO5	-	-	2	2	2	-	-	2	-	3	-	2
CO6	-	-	-	-	-	2	-	2	3	3	-	2

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## THIRD SEMESTER

### BAOTT-301 Basic techniques of Anaesthesia

#### Learning Objectives

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.

#### Course Outcome:

- CO1: Remember** the baseline terminology, core components, induction agents, vaporizers, airway devices, and safety mechanisms of the Anaesthesia machine.
- CO2: Understand** the principles of balanced Anaesthesia, pre-oxygenation, fluid management strategies, and methods of perioperative pain control.
- CO3: Apply** specific maneuvers, such as Sellick's maneuver, and airway management protocols to maintain a patent airway during intubation.
- CO4: Analyze** perioperative patient histories, physical exams, and vital signs to assess Anaesthesia risks and recognize indications for emergency medications.
- CO5: Evaluate** physiological monitoring variables, depth of Anaesthesia, fluid balance, and clinical challenges to judge patient stability across common general and obstetric surgeries.
- CO6: Create** a comprehensive perioperative Anaesthesia care plan coordinating patient preparation, premedication, maintenance, monitoring, and post-operative analgesia.

#### Course Contents

##### Basics Techniques of Anaesthesia

- 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.
- b) Anaesthesia Machine: Design, Components, and Functionality.

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- c) Safety systems in Anaesthesia machine. Flow systems, CO2 Absorbents, Circuit types, Humidification devices.
- d) Perioperative Fluid Management: Strategies and Considerations. (Crystalloids and Colloids).
- e) Perioperative Emergency Medications: Indications, Administration, and Management
- f) Anesthetic induction and airway management: Learning about various induction techniques, airway devices, and strategies for maintaining a patent airway during surgery.
- g) Brief Idea about Premedication, Pre oxygenation or denitrogenating, Induction and inducing agents, Sellick's maneuverer, Vaporizers, Principles and types, Intubation, and reversal agents.  
Maintenance of Anaesthesia 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.
- h) Pain management and analgesia: Exploring different methods of perioperative pain management, including systemic analgesics, regional Anaesthesia, and patient-controlled analgesia.
- i) 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.
- j) 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.
- k) Management of Anaesthesia-related complications: Understanding the recognition and management of potential complications and adverse events related to Anaesthesia, including cardiovascular, respiratory, and allergic reactions.

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### Practical or Clinical posting topics:

- 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 Anaesthesia treatment.
- Anaesthesia machine and safety systems: Familiarization with the components and functionality of an anaesthesia machine through hands-on experience.
- Regional Anaesthesia procedures: Training in various regional anaesthesia techniques, such as peripheral nerve blocks and epidurals, using simulation.
- Management of Anaesthesia-related complications
- Simulation of Anaesthesia-related problems such as airway obstruction, hypotension, and allergy through role-playing.

### Reference Books:-

1. Miller's Anaesthesia by *Michael A. Gropper, Lars I. Eriksson, Lee A. Fleisher, Jeanine P. Wiener-Kronish, Neal H. Cohen, and William L. Young* – Vols. 1 & 2
2. Morgan and Mikhail's Clinical Anesthesiology by *John F. Butterworth, David C. Mackey, and John D. Wasnick*
3. Understanding Anaesthesia Equipment by *Jerry A. Dorsch and Susan E. Dorsch*
4. Stoelting's Pharmacology & Physiology in Anesthetic Practice by *Pamela Flood, James P. Rathmell, and Steven Shafer*
5. Textbook of Anaesthesia by *Alan R. Aitkenhead, Iain K. Moppett, and Jonathan P. Thompson*

### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	2	-	-	1	1	-	2
CO2	3	3	2	3	2	3	-	-	-	-	-	2
CO3	3	3	2	2	2	2	-	-	2	-	-	2
CO4	3	3	1	3	-	3	-	-	-	-	-	2
CO5	2	3	2	2	3	2	1	-	2	-	-	2
CO6	2	3	2	3	3	2	-	1	1	1	-	2

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## BAOTT-302 Basics of Surgical Procedures

### Learning Objectives

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.

### Course Outcome:

Graduate will be able to:-

- CO1: Remember** the operation theatre layout, WHO checklist components, and names of common surgical instruments.
- CO2: Understand** indications, principles, and pathologies of common general surgical, obstetric, and gynaecologic diseases.
- CO3: Apply** hand hygiene, gowning, gloving, carbolization, fumigation, and sterile field techniques during procedures.
- CO4: Analyze** surgical incision types, wound closure methods, and patient positioning requirements to optimize surgical safety.
- CO5: Evaluate** clinical patient status to execute surgical site infection prevention protocols and antimicrobial prophylaxis.
- CO6: Create** a perioperative plan coordinating Anaesthesia considerations, instrument handling, and steps for major general and gynaecologic surgeries.

### Course Contents:-

#### Basics of Surgical Procedures

1. Layout of Operation Theatre, WHO Checklist, Carbolization and Fumigation:
2. Introduction to general surgical procedures: Understanding the principles, indications, and techniques of common general surgical procedures, such as appendectomy, cholecystectomy, and hernia repair.

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3. 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 techniques.
4. Diseases in General Surgical Practice: Appendicitis, Hernias, cholecystitis, Gastrointestinal (GI) Cancers, Peptic Ulcer Disease.
5. Diseases in Obstetric/ Gynaecologic Practice": Ectopic Pregnancy, Pelvic Inflammatory
6. Disease (PID), Endometriosis, Fibroids, Ovarian Cysts, Cervical and Ovarian Cancer
7. Incision and wound closure techniques: Studying various surgical incision types, wound closure methods (such as sutures, staples, and adhesive tapes), and wound dressing principles
8. 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.
9. 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 practices.
10. Anaesthesia considerations and patient positioning in general surgery: Understanding the specific Anaesthesia considerations and patient positioning requirements for general surgical procedures to optimize patient safety and surgical outcomes.
11. Common general surgical procedures in obstetrics and Gynecology: Studying the specific surgical procedures performed in obstetrics and gynaecology, such as caesarean section, hysterectomy, and ovarian cystectomy, and their related considerations

**Practical / Clinical Postings topics:**

- 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.

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- Anaesthesia 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 anaesthesia providers and surgical team members during patient placement.

**Reference Books:-**

1. Berry & Kohn's Operating Room Technique by *Nancymarie Phillips*
2. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
3. Alexander's Care of the Patient in Surgery by *Jane C. Rothrock*
4. SRB's Manual of Surgery by *Sriram Bhat M*
5. Textbook of Operative Surgery by *Sir Charles Illingworth*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	1	3	-	1	-	-	-	2
CO2	3	3	2	2	3	2	1	-	2	-	-	2
CO3	2	3	2	2	2	2	2	-	-	-	-	2
CO4	2	2	1	2	3	2	2	-	-	-	-	2
CO5	3	2	2	2	3	2	-	-	2	-	-	2
CO6	2	3	2	2	2	3	-	-	2	1	-	2

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## BAOTT-303: CSSD & Manifold Area

### Learning Objectives

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.

### Course Outcome:

- CO1: Remember** the types of medical gases, core terminology of sterilization methods, and fundamental components of hospital manifold and Central Sterile Services Department (CSSD) systems.
- CO2: Understand** the principles of infection control, decontamination methods, proper instrument packaging techniques, and the roles of pressure regulation systems.
- CO3: Apply** correct hands-on protocols for manual cleaning, mechanical enzymatic washing, sterile packaging, inventory labeling, and personal protective equipment (PPE) usage.
- CO4: Analyze** specific inventory systems (like first-in, first-out / FIFO) and spatial layouts of CSSD and manifold systems to minimize cross-contamination risks.
- CO5: Evaluate** sterilization process parameters utilizing chemical and biological quality assurance monitoring tools to ensure full regulatory standards compliance.
- CO6: Create** a comprehensive maintenance and troubleshooting workflow to guarantee the optimal performance of manifold systems, sterilizers, washers, and drying cabinets.

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## Course Contents:

### CSSD Procedures

- 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.
- 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.
- c) Decontamination processes: Learning about the decontamination procedures involved in CSSD, including manual cleaning, mechanical cleaning (using ultrasonic cleaners), and enzymatic cleaning.
- 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.
- 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.
- 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.
- 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.
- 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.

### Manifold:

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,

Troubleshooting and Problem-solving,

Regulations and Compliance.

### **Practical Sessions for CSSD & Manifold Area:**

CSSD Procedures

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

### **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.

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### 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.

### Reference Books:-

1. Central Sterile Service Department (CSSD): A Comprehensive Guide by *N.N. Mathur and Archana Mathur*
2. Sterilization Technology for the Health Care Facility by *Marimargaret Reichert and Jack H. Young*
3. Decontamination in Hospitals and Healthcare by *Jimmy Walker*
4. Principles of Hospital Administration and Planning by *B. M. Sakharkar*
5. Medical Gas Pipeline System by *Hospitals and Health Care (HHS) standards and guidelines*

### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	-	1	3	3	1	-	-	-	2
CO2	3	3	2	2	3	2	3	-	-	-	-	2
CO3	2	3	2	2	2	2	3	-	1	-	-	2
CO4	2	2	2	-	-	2	2	-	2	1	3	2
CO5	3	3	2	2	3	3	2	-	-	-	-	2
CO6	2	2	3	3	2	3	2	2	-	-	-	3

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## **BAOTT-304: Industrial orientation and Industrial Visit**

### **Learning Objectives**

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.

### **Course Outcome:**

- CO1: Remember** the types of industries relevant to Operation Theatre and Anaesthesia Technology, including device manufacturing, pharmaceutical companies, and healthcare facilities.
- CO2: Understand** the significance of industrial visits for practical exposure, professional ethics, confidentiality, and organizational structures.
- CO3: Apply** scheduling, logistical arrangements, workplace rules, and safety guidelines to systematically prepare for a successful industrial visit.
- CO4: Analyze** industrial workflows, operations, and departmental roles through direct observation and professional interaction to identify sector-specific challenges.
- CO5: Evaluate** the practical implications and curriculum relevance of the visited industry through structured reflective learning and group discussions.
- CO6: Create** a comprehensive field report or presentation that effectively summarizes key observation data, industry practices, and future professional development insights.

### **Course Contents**

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

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

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- 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.
- 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.
- f. Ethical considerations: Understanding ethical guidelines and professional conduct expected during the industrial visit, including respecting confidentiality, intellectual property, and workplace rules.
- 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.
- 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.

#### Reference Books:-

1. Medical Device Quality Management Systems: A Practical Guide for ISO 13485 by *Susumu Nozawa*
2. Introduction to Medical Equipment Technology by *Joseph J. Carr and John M. Brown*
3. Pharmaceutical Manufacturing Handbook: Regulations and Quality by *Shayne Cox Gad*
4. Professionalism in Health Care: A Guide for Career Success by *Sherry Makely*
5. Workplace Learning and Development: A Guide to Getting it Right by *Nigel Harrison*

#### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	2	1	1	-	-	-	-	2
CO2	2	2	1	2	2	1	1	-	1	-	-	3
CO3	-	-	2	-	-	2	2	1	2	1	2	2
CO4	-	-	-	-	-	1	-	1	2	2	2	2
CO5	-	-	-	-	-	-	-	3	3	3	-	2
CO6	-	-	-	1	1	-	-	1	1	3	-	3

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## FOURTH SEMESTER

### BAOTT-401: Advanced Anaesthesia Techniques

#### Learning Objectives

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.

#### Course Outcome:

##### Graduate will be able to:

- CO1: Remember** the anatomical challenges, advanced airway devices, and specific anesthetic agents required for complex head, neck, and eye procedures.
- CO2: Understand** the unique considerations for ophthalmic cases, sinus surgeries, and the underlying mechanisms of specialized nerve blocks.
- CO3: Apply** clinical techniques for fiberoptic intubation, supraglottic airway placement, and optimal patient positioning during simulated ENT practices.
- CO4: Analyze** surgical variations, bleeding limitations, and airway access constraints to select appropriate inhalational or intravenous anesthetic management strategies.
- CO5: Evaluate** patient responses and perioperative complications to execute immediate prevention and management protocols for adverse anesthetic events.
- CO6: Create** a comprehensive advanced Anaesthesia care blueprint optimizing airway patency, field visibility, and regional block safety for complex ENT and ophthalmic procedures.

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## Course Contents

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

1. 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.
2. 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.
3. anaesthetic techniques for ophthalmic surgeries: Studying the unique considerations for providing Anaesthesia during eye surgeries, including cataract extraction, retinal surgeries, and glaucoma procedures.
4. 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.
5. 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.

### Practical Sessions:

1. Considerations for Anaesthesia in ENT Surgery:
2. 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.
3. Anaesthetic 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.
4. Anaesthetic 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.

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

1. Fiberoptic 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.
2. 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).
3. Ophthalmic Surgery Anaesthesia Techniques:
4. 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:**

1. 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:**

1. Difficult Airway Scenarios and Airway Obstruction:
2. 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:**

1. Ocular Emergencies Simulation: During ophthalmic procedures, students will encounter simulated ocular emergencies such as rapid loss of vision or high intraocular pressure.
2. They will learn and practice the necessary emergency management strategies.
3. 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.

**Reference Books:-**

1. Principles of Airway Management by *Brendan T. Finucane, Albert H. Santora, and Carin A. Hagberg*
2. Anaesthesia for ENT Surgery by *Michael T. G. Long and Dr. R. J. S. Birks*
3. Ophthalmic Anaesthesia: A Practical Handbook by *Chris Dodds, Chandra Kumar, and Gopinath Gnanasekaran*
4. Morgan and Mikhail's Clinical Anesthesiology by *John F. Butterworth, David C. Mackey, and John D. Wasnick*
5. Benumof and Hagberg's Airway Management by *Carin A. Hagberg*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	-	2	-	-	1	-	-	2
CO2	3	3	2	3	3	3	1	-	2	-	-	2
CO3	3	2	2	2	-	2	-	-	1	-	-	2
CO4	3	3	2	2	1	2	-	-	-	-	-	2
CO5	3	3	2	3	-	3	-	1	-	-	-	2
CO6	2	3	2	2	2	3	-	-	2	1	-	2

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## **BAOTT-402: Advanced Surgical Procedures**

### **Learning Objectives**

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.

### **Course Outcome:**

#### **Graduate will be able to:-**

- CO1: Remember** the specialized surgical instrumentation, laser precautions, safety training regulations, and mandatory warning signage for ENT and ophthalmic procedures.
- CO2: Understand** the pathological mechanisms of conditions like chronic sinusitis, cataracts, glaucoma, retinal detachment, and retinoblastoma.
- CO3: Apply** correct patient positioning, laser plume management, protective eyewear protocols, and laser interlock safety workflows in the operating room.
- CO4: Analyze** different surgical approaches—including endoscopic sinus surgery, laryngoscopy, tracheostomy, vitrectomy, and keratoplasty—to differentiate procedural requirements.
- CO5: Evaluate** laser hazard assessment data and clinical case profiles to ensure full regulatory compliance and maximum safety during laser-assisted surgeries.
- CO6: Create** a comprehensive perioperative plan coordinating step-by-step instrument setups, positioning, and safety check workflows for complex head, neck, and eye surgeries.

### **Course Contents:-**

#### **Advanced Surgical Procedures**

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.
2. Diseases in Otolaryngology (ENT) : Chronic Sinusitis, Tonsillitis, Deviated Septum Otitis Media, Vocal Cord Nodules or Polyps, Obstructive Sleep Apnea (OSA), Laryngeal Cancer
3. Nasal Polyps, Salivary Gland Disorders, Cochlear Implantation.
4. Diseases in Ophthalmology:

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- a. Cataracts - Cataract Extraction and Intraocular Lens (IOL) Implantation,
  - b. Glaucoma - Trabeculectomy, Shunt Implantation, Laser Therapy
  - c. Age-related Macular Degeneration (AMD) - Intravitreal Injections, Laser Therapy, Photodynamic Therapy
  - d. Diabetic Retinopathy - Vitrectomy, Laser Therapy
  - e. Retinal Detachment - Retinal Detachment Repair
  - f. Dry Eye Syndrome - Punctal Occlusion Surgery
  - g. Conjunctivitis - Symptomatic Treatment (Medications, Eye Drops)
  - h. Corneal Diseases - Corneal Transplantation (Keratoplasty)
  - i. Refractive Errors - LASIK (Laser-Assisted in Situ Keratomileusis), PRK (Photorefractive Keratectomy)
5. Retinoblastoma - Chemotherapy, Radiation Therapy, Enucleation (Eye Removal)
  6. 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.
  7. 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.
  8. 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.
  9. 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. 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.
  11. 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

**List of Practical:**

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1. 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.
2. 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.
3. Endoscopic sinus surgery involves hands-on experience with endoscopic instruments, including sinus scopes and instrumentation.
4. 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.

#### Reference Books:-

1. Berry & Kohn's Operating Room Technique by *Nancymarie Phillips*
2. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
3. Alexander's Care of the Patient in Surgery by *Jane C. Rothrock*
4. Laser Safety in the Operating Room by *Donald C. Winburn*
5. Textbook of Operative ENT Surgery by *Michael S. Benninge*

#### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	-	2	-	-	-	-	-	2
CO2	3	3	2	2	3	3	1	-	2	-	-	2
CO3	3	2	2	3	2	2	-	-	-	-	-	2
CO4	2	2	3	2	3	3	2	1	1	-	-	3
CO5	3	2	2	2	3	2	-	-	1	-	-	2
CO6	3	3	2	3	1	3	-	-	2	1	-	2

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## BAOTT-403 Basic Intensive Care

### Learning Outcomes

Upon completion of this course, students will be able to maintain, clean, troubleshoot, and safely operate ICU equipment, including ventilators, suction machines, monitors, beds, and lights. They will understand the principles of sterilization, disinfection, air quality management, and HVAC systems in critical care settings. Students will develop skills in caring for unconscious and semiconscious adult and pediatric patients, including positioning, hygiene, monitoring, suctioning, feeding, and emergency management. They will also gain competence in oxygen therapy, ventilation assessment, and the use of appropriate ventilation techniques and delivery systems based on patient needs.

### Course Outcomes:

- CO1: Remember** the structural components, working principles, and types of ventilators, oxygen masks, artificial airways, spirometers, and hemodynamic monitoring devices.
- CO2: Understand** the principles of mechanical ventilation (volume, time, pressure-cycled, and high-frequency), aseptic management, pollution control, and the psychological needs of critical patients, relatives, and staff.
- CO3: Apply** correct clinical protocols for bag-valve-mask ventilation, suctioning, posturing, Ryle's tube insertion, feeding, hyperalimentation, and respiratory therapy.
- CO4: Analyze** arterial blood gas (ABG) techniques, continuous physiological monitor parameters, and patient criteria for short-term transport ventilation or jet ventilation.
- CO5: Evaluate** patient responses during ventilation crises, hemofiltration, hemodialysis, and specialized airway management to determine necessary clinical adjustments.
- CO6: Create** a comprehensive intensive care maintenance and safety plan that integrates routine sterilization, device care, and specialized monitoring strategies for adult and pediatric patients.

### Course Contents:-

#### Basic Intensive Care

- 1) Care and maintenance of ventilators, suction machine, monitoring devices.
- 2) Sterilization and disinfection of ventilators.
- 3) Care, maintenance and operational capabilities of beds, lights and other apparatus.
- 4) Air conditioning and control of pollution in ICU.
- 5) Attachment and intraoperative utility of ventilators and monitoring devices.
- 6) Care of unconscious adult and paediatric patients.

- 7) Physiotherapy techniques, feeding, Ryle's tube insertion and hyperalimentation.
- 8) Suctioning and posturing of semiconscious and unconscious patients.
- 9) Oxygen therapy, maintenance of clear Airway, Various types of masks.
- 10) Ventilation of patient in crisis:
- 11) Resuscitator/ bag valve mask assembly
- 12) Different types of Airways.
- 13) Short term ventilation/ Transport ventilators.
- 14) ABG techniques & analysis.
- 15) Management of asepsis.
- 16) Psychological aspects of the patient, relative and staff.
- 17) Hemofiltration and hemodialysis.
- 18) Jet Ventilation.
- 19) Ventilators: Principles of working of different ventilators:
- 20) Volume cycled/Time cycled/Pressure cycled ventilators.
- 21) High frequency ventilators and other types.
  - i. Methods of measuring the expired gases from the patient; Types of spirometers, Principles of working of spirometers. Clinical application of above apparatus.
  - ii. 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.
  - iii. Laryngeal sprays; Types, material, principle, and mechanism.
  - iv. Monitoring techniques and equipment; Cardiac monitors, Respiratory monitors, Spirometers, Temperature monitors.

**Practical/ Clinical Postings:**

- 1) Ventilator Care and Maintenance:
  - a. Hands-on practice in the proper care and maintenance of ventilators, including cleaning, sterilization, and disinfection techniques.
  - b. Understanding the functions and operation of different modes and settings of ventilators.
  - c. Troubleshooting common ventilator issues and alarm management.

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2) Bed and Apparatus Care:

- a. Practical demonstration of bed maintenance, including adjustment of height, positioning, and proper use of bed controls.
- b. Familiarization with the operational capabilities of ICU lights and other apparatus, such as infusion pumps and monitors.
- c. Cleaning and disinfection procedures for bed surfaces and equipment.

3) Air Conditioning and Pollution Control in ICU:

- a. Practical session on the management of air conditioning systems in the ICU to maintain optimal temperature, humidity, and air quality.
- b. Understanding the importance of infection control measures and strategies to minimize airborne contaminants in the ICU environment.

4) Care of Unconscious Patients:

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

5) Oxygen Therapy and Airway Management:

- a. Hands-on practice in administering oxygen therapy using different types of masks and nasal cannulas.
- b. Simulation of airway management techniques, including insertion and securing of endotracheal tubes, use of different types of airways, and bag-valve mask ventilation.

6) Physiotherapy Techniques and Feeding Methods:

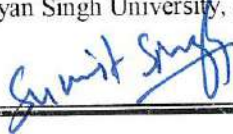
- a. Practical demonstration and practice of physiotherapy techniques, such as chest physiotherapy and postural drainage, to promote airway clearance.
- b. Training on safe and proper insertion of Ryle's tube for enteral feeding, followed by simulated feeding procedures and maintenance.

7) Hemofiltration and Hemodialysis:

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

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

8) Psychological Aspects of Patients, Relatives, and Staff:

- a. Interactive sessions focusing on the psychological aspects of patients, their relatives, and healthcare staff in the ICU setting.
- b. Role-playing exercises to develop effective communication skills and strategies for providing emotional support to patients and their families.

**Reference Books:-**

1. Marini and Wheeler's Critical Care Medicine: The Essentials by *John J. Marini and Arthur P. Wheeler*
2. The ICU Book by *Paul L. Marino*
3. Pilbeam's Mechanical Ventilation: Physiological and Clinical Applications by *J. M. Cairo*
4. Principles of Critical Care by *Jesse B. Hall, Gregory A. Schmidt, and John P. Kress*
5. Equipment for Respiratory Care by *Teresa A. Volsko, Michael J. Richards, and Robert L. Chatburn*

CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3	3	3	-	-	-	-	-	2
CO2	2	2	2	-	1	2	3	-	-	-	-	2
CO3	2	3	2	2	3	2	1	-	1	-	-	2
CO4	3	3	2	3	3	3	-	-	2	1	-	2
CO5	3	3	1	3	3	2	-	-	-	-	-	2
CO6	3	2	2	2	-	3	-	1	2	1	-	2

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## BAOTT-404 Clinical Medicine & Related Management

### Learning Objectives

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.

### Course Outcome:

- CO 1 : Remember** diagnostic investigations relevant to the cardiovascular and respiratory systems listed in this syllabus.
- CO 2 : Explain** the pathophysiological mechanisms of common arrhythmias, hypertension, and heart failure.
- CO 3 : Apply** proper clinical examination techniques for evaluating asthma, COPD, and pneumonia.
- CO 4 : Analyze** between the clinical signs of pleural effusion, pneumothorax, lung abscess, and bronchiectasis.
- CO 5 : Evaluate** patient severity levels in acute presentations of respiratory failure and valvular heart disease.
- CO 6 : Create** comprehensive, evidence-based management plans for pulmonary tuberculosis and lung carcinoma.

### Course Contents:-

- 1) Clinical Medicine & Related Management
  - a. Respiratory & cardiovascular system-
  - b. Examination and Investigations relevant to cardiovascular system
  - c. Ischemic heart disease
  - d. Valvular heart diseases
  - e. Common arrhythmias encountered in clinical practice
  - f. Hypertension

- g. Heart failure
- h. Cardiomyopathies
- i. Examination and Investigations relevant to respiratory system
- j. Asthma and COPD
- k. Pneumonia
- l. Pulmonary tuberculosis
- m. Bronchiectasis
- n. Lung abscess
- o. Pneumothorax
- p. Pleural effusion
- q. Respiratory failure types, causes and management
- r. Carcinoma lung

**Reference Books:-**

1. Davidson's Principles and Practice of Medicine by *Stuart H. Ralston, Ian D. Penman, Mark W.J. Strachan, and Richard P. Hobson*
2. Harrison's Principles of Internal Medicine by *Joseph Loscalzo, Anthony Fauci, Dennis Kasper, Stephen Hauser, Dan Longo, and J. Larry Jameson*
3. Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice by *Michael Glynn and William M. Drake*
4. Textbook of Respiratory Medicine by *Jyotirmoy Pal, Sukumar Mukherjee, and Arup Kumar Kundu*
5. API Textbook of Medicine by *The Association of Physicians of India*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	2	2	-	-	-	-	-	2
CO2	3	3	2	3	1	3	-	-	-	-	-	2
CO3	3	2	2	2	1	2	-	-	-	-	-	2
CO4	3	3	2	3	1	3	-	-	-	-	-	2
CO5	3	2	2	3	2	3	1	-	-	-	-	2
CO6	3	3	2	3	1	3	-	1	-	-	-	2

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## FIFTH SEMESTER

### BAOTT-501 Specialized Anaesthesia-1

#### Learning Objectives

Upon completion of this course, students will be able to understand and apply anaesthetic principles and techniques in orthopedic, pediatric, and urological surgeries, including the use of regional anaesthesia for pain management. They will recognize the physiological, pharmacological, and perioperative considerations involved in managing pediatric patients and those with congenital anomalies. Students will develop competence in performing and assisting with regional anaesthesia techniques, monitoring patients, managing complications, and ensuring safe perioperative care. They will also collaborate effectively with the surgical team, apply evidence-based practices, and adopt a proactive approach to optimizing patient outcomes and minimising anaesthesia-related risks.

#### Course Outcome:

- CO1: Remember** names, classifications, standard diagnostic tests, and reference resources for cardiopulmonary diseases.
- CO2: Understand** the underlying pathophysiology of ischemic heart disease, arrhythmias, hypertension, asthma, COPD, and lung cancer.
- CO3: Apply** appropriate clinical examination steps and diagnostic workflows to investigate cardiovascular and respiratory systems.
- CO4: Analyze** diagnostic readouts to differentiate between pneumonia, tuberculosis, lung abscess, pneumothorax, and pleural effusion.
- CO5: Evaluate** patient investigation data to determine immediate clinical management strategies for heart failure and respiratory crises.
- CO6: Create** a multi-system clinical monitoring and care pathway coordinating long-term therapy and urgent interventions for cardiopulmonary patients.

#### Course Contents:-

#### Specialized Anaesthesia-1

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

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

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

#### **Orthopedic Surgery:**

- a. Simulation-based training on anaesthetic considerations and techniques for joint replacement surgeries, such as patient positioning, regional anaesthesia techniques, and intraoperative pain management.
- b. Anesthetic treatment for fracture fixation procedures, including the use of various types of anaesthesia and monitoring measures, is demonstrated in practice.
- c. Role-playing scenarios to better grasp the problems and decision-making involved in giving spinal anaesthesia.

#### **Paediatric Surgery:**

- a. Hands-on practice in pediatric airway care using suitable devices and techniques, such as mask ventilation, intubation, and supraglottic airway devices.
- b. Simulation scenarios concentrating on the special issues for inducing and maintaining anaesthesia in paediatric patients, including as dose calculation, monitoring, and intraoperative care.
- c. A hands-on session on juvenile pain management strategies, such as regional anaesthesia and multimodal analgesia.

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- d. Anaesthesia for Paediatric Patients with Congenital abnormalities: Interactive sessions addressing anesthetic problems and considerations when caring for children with congenital abnormalities.
- e. Case studies and role-playing exercises are used to learn about preoperative evaluation, anaesthesia planning, and intraoperative care of unique congenital abnormalities.
- f. Simulations of emergency situations and crisis management in paediatric patients with congenital abnormalities.

**Urological surgeries:**

- a. 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.
- b. Training in urological surgery positioning and patient preparation, including the use of regional anaesthetic and intravenous sedation procedures.
- c. Scenarios based on simulation to better understand intraoperative problems and management of fluid balance, hemodynamic, and pain control during urological procedures.
- d. Techniques of Regional Anaesthesia for Orthopedic and Urological Procedures:
- e. Practical experience with peripheral nerve blocks, including landmark recognition, needle insertion, and local anaesthetic administration.
- f. Training in spinal anaesthetic procedures using simulation, including patient placement, sterile technique, and dose calculation.

**Anaesthesia Considerations:**

- a. Case-based discussions on Anaesthesia considerations specific to orthopedic, Pediatric, and urological surgeries, focusing on patient assessment, Anaesthesia induction, and intraoperative monitoring.
- b. Interactive sessions on pain management strategies for surgical patients in these specialties, including the use of regional Anaesthesia techniques, multimodal analgesia, and patient-controlled analgesia.
- c. Simulation scenarios to practice crisis management during surgery, such as intraoperative bleeding, anaphylactic reactions, or airway emergencies.

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### 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.

### Reference Books:-

- Smith's Anaesthesia for Infants and Children by *Peter J. Davis and Franklyn P. Cladis*
- Orthopedic Anaesthesia by *Chris Dodds and Chandra Kumar*
- Urologic Anaesthesia by *B. Reves and Jeffrey R. Kirsch*
- Hadzic's Peripheral Nerve Blocks and Anatomy for Ultrasound-Guided Regional Anaesthesia by *Admir Hadzic*
- Gregory's Pediatric Anaesthesia by *George A. Gregory and Dean B. Andropoulos*

### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	2	-	-	1	-	-	2
CO2	3	2	2	3	-	3	-	-	-	-	-	2
CO3	3	3	2	2	2	3	-	-	2	-	-	2
CO4	3	3	2	3	2	3	-	-	1	1	-	2
CO5	3	3	2	2	1	2	-	-	-	-	-	2
CO6	3	3	2	2	2	2	-	-	-	-	-	2

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## BAOTT-502: Specialized surgery-1

### Learning Objectives:

Upon completion of this course, students will be able to understand the clinical features and surgical management of common orthopedic, pediatric, and urological conditions. They will gain knowledge of patient positioning, perioperative care, pain management, anesthesia considerations, and postoperative rehabilitation. Students will also develop competence in the safe use of C-arm fluoroscopy, including radiation safety, infection control, and quality assurance practices. Furthermore, they will be able to collaborate effectively with the surgical team, apply evidence-based practices, manage surgical complications, and provide comprehensive patient-centered care in orthopedic, pediatric, and urological surgical settings.

### Course Outcome:

- CO1: Remember** names, terminology, specialized implants, instruments, and patient positioning for common orthopedic surgeries.
- CO2: Understand** the clinical pathology of fractures, osteoarthritis, scoliosis, herniated discs, bone tumors, and osteoporosis.
- CO3: Apply** C-arm radiation safety rules, contrast media protocols, and emergency safety workflows in the operating room.
- CO4: Analyze** procedural steps distinguishing joint replacements, fracture fixation (ORIF), spinal decompressions, and ligament reconstructions.
- CO5: Evaluate** patient identification, consent forms, infection control data, and radiation doses to ensure surgical safety.
- CO6: Create** a perioperative setup plan coordinating specialized equipment, C-arm integration, and tracking tools for orthopedic procedures.

### Course Contents:-

#### Specialized surgery 1

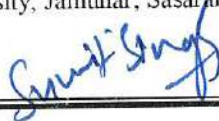
##### 1) Diseases in Orthopedics

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

  
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- b. 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.
- c. Herniated Disc: Protrusion of intervertebral disc causing nerve compression. Surgical options include discectomy or spinal fusion.
- d. 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.
- e. Carpal Tunnel Syndrome: Compression of the median nerve in the wrist. Surgical treatment involves carpal tunnel release to alleviate pressure on the nerve.
- f. 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.
- g. 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.
- h. 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.
- i. Bone Tumors: Abnormal growths in bones that may require surgical removal, such as tumor resection or limb-sparing surgeries.
- j. Osteoporosis: Loss of bone density, leading to increased fracture risk. Surgical procedures may include vertebroplasty or kyphoplasty for spinal compression fractures.
- k. 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
- l. 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.

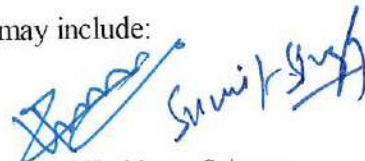

2) **Diseases in Pediatric Surgery:**

- a. 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.
- b. 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.
- c. 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.
- d. 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.
- e. 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.
- f. 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.
- g. Pediatric Trauma: Surgical management of traumatic injuries in children, including fractures, burns, or lacerations. Surgeries aim to repair and stabilize the injured areas.

3) 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.

4) Urological Diseases and Related Surgeries:

- a. Kidney Stones: Surgical procedures may include:



- b. Extracorporeal Shock Wave Lithotripsy (ESWL): Non-invasive procedure that uses shock waves to break down kidney stones into smaller pieces, making them easier to pass.
- c. Ureterscopy with Laser Lithotripsy: Minimally invasive procedure where a thin tube is inserted into the ureter to remove or break down stones using a laser.
- d. Urinary Tract Infections (UTIs): Surgeries are not typically required for UTIs. Treatment usually involves antibiotics to eliminate the infection.
- e. Urinary Incontinence: Surgical options for urinary incontinence include:
- f. Sling Procedures: Placement of a sling or mesh to support the urethra and prevent leakage of urine.
- g. Bladder Neck Suspension: Surgical procedure to provide support to the bladder neck and urethra.
- h. Artificial Urinary Sphincter: Placement of an artificial valve around the urethra to control urine flow.
- i. Benign Prostatic Hyperplasia (BPH): Surgical procedures for BPH include:
- j. Transurethral Resection of the Prostate (TURP): Removal of excess prostate tissue using a resectoscope inserted through the urethra.
- k. 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.
- l. Bladder Cancer: Surgical treatment options for bladder cancer include:
- m. Transurethral Resection of Bladder Tumor (TURBT): Removal of bladder tumors using a resectoscope inserted through the urethra.
- n. Radical Cystectomy: Surgical removal of the entire bladder, often followed by the creation of a urinary diversion.
- o. Prostate Cancer: Surgical procedures for prostate cancer include:
- p. Testicular Cancer: Surgical treatment for testicular cancer typically involves:
- q. Radical Inguinal Orchiectomy: Surgical removal of the affected testicle through an incision in the groin area.
- r. Erectile Dysfunction: Surgical options for erectile dysfunction include:
- s. Penile Implants: Surgical insertion of inflatable or malleable implants to restore erectile function.

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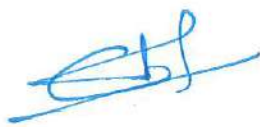
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- t. Vascular Surgery: Procedures to improve blood flow to the penis, such as arterial bypass surgery or penile venous ligation.
- u. Vesicoureteral Reflux (VUR): Surgical options for VUR include:
- v. Deflux Injection: Endoscopic procedure where a bulking agent is injected into the bladder wall to create a flap that prevents urine from flowing back into the ureters.
- w. Ureteral Reimplantation: Surgical procedure to reposition the ureter and create a new valve mechanism to prevent reflux.
- x. Renal Tumors: Surgical treatment for renal tumors may include:
- y. Partial Nephrectomy: Removal of the tumor while preserving healthy kidney tissue.
- z. Radical Nephrectomy: Surgical removal of the entire affected kidney.

#### **Urological surgical procedures:**

- a. 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.
  - b. Catheter types and sizes, Catheterization techniques, Different types of scopes used in Urology (Nephroscope, cystoscope, resectoscope, Ureteroscope).
  - c. 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.
- 5) 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.
- 6) 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.



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

### **Orthopedic Surgeries:**

- a) Practical demonstration of surgical positioning techniques for different orthopedic procedures, such as joint replacement surgeries, fracture fixation, and spine surgeries.
- b) Hands-on practice with orthopedic surgical instruments, implants, and techniques used in specific procedures like total knee replacement or fracture fixation.
- c) Simulation-based training on postoperative care and rehabilitation exercises for orthopedic patients, including mobility assistance and range of motion exercises.

### **Pediatric Surgery:**

- a) Practical session on sterile techniques and instrument handling specific to pediatric surgeries, such as cleft lip and palate repair or hernia repair in children.
- b) Simulation scenarios focusing on the management of pediatric patients during different stages of surgery, including preoperative preparation, Anaesthesia induction, and intraoperative care.
- c) Role-playing exercises to understand the unique considerations in postoperative care for pediatric surgical patients, including pain management and family support.

### **Urological Surgeries:**

- a) Hands-on training on catheterization techniques, including different types of catheters and sizes used in urological procedures.
- b) Practical demonstration of the use of various urological scopes, such as nephroscope, cystoscope, and ureteroscope, for diagnostic and surgical purposes.
- c) Simulation-based scenarios to understand the perioperative management of urological surgical patients, including Anaesthesia considerations, positioning, and intraoperative complications.

### **Minimally Invasive Techniques:**

- a) Practical session on arthroscopy techniques used in orthopedic surgeries, including joint examination, instrument handling, and diagnostic procedures.
- b) Hands-on practice with laparoscopic instruments and techniques for pediatric and urological surgeries, including trocar insertion, camera navigation, and suturing.

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- c) 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.

**Reference Books:-**

1. Campbell's Operative Orthopaedics by *Frederick M. Azar, James H. Beaty, and S. Terry Canale*
2. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
3. Alexander's Care of the Patient in Surgery by *Jane C. Rothrock*
4. Textbook of Orthopedics by *John Ebnezar*
5. Radiation Safety in Imaging Departments by *Mary Alice Statkiewicz Sherer, Paula J. Visconti, and E. Russell Ritenour*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO4	3	3	2	2	2	2	-	-	1	-	-	2
CO5	3	3	2	3	2	3	-	-	2	1	-	2
CO6	3	2	2	2	3	2	-	-	-	-	-	2

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## BAOTT-503 Recent Advancements in Anaesthesia and Surgical Fields

### Learning Objectives

Upon completion of this course, students will be able to understand recent advances in anesthesia and surgical practice, including minimally invasive surgery, enhanced recovery after surgery (ERAS), advanced anesthetic techniques, neuromuscular monitoring, and multimodal pain management. They will recognize the importance of patient safety, infection prevention, and evidence-based perioperative care. Students will develop the ability to evaluate the benefits and limitations of emerging technologies and techniques, apply strategies to optimize patient outcomes, and contribute effectively to safe, high-quality surgical and anesthesia care in modern healthcare settings.

### Course Outcome:

- CO1: Remember** terms and components of robotic surgery, ERAS protocols, TIVA, BIS monitoring, and advanced imaging.
- CO2: Understand** the principles of multimodal analgesia, multidisciplinary ERAS workflows, and artificial intelligence in surgical support.
- CO3: Apply** surgical safety checklists, infection prevention protocols, and specialized monitoring devices (BIS, CNAP, neuromuscular).
- CO4: Analyze** emerging technologies like 3D printing, virtual reality, intraoperative ultrasound, and image-guided navigation for surgical planning.
- CO5: Evaluate** Anaesthesia depth, drug dosing accuracy, and opioid consumption to maximize patient safety and recovery.
- CO6: Create** a modern perioperative care template combining minimally invasive methods, advanced monitoring, and enhanced recovery protocols.

### Course Contents:-

#### Recent Advancements in Anaesthesia and Surgical Fields

- 1) **Minimally Invasive Surgery:** Exploring the advancements in minimally invasive surgical techniques, such as laparoscopy, robotic surgery, and endoscopic procedures,

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and their benefits in terms of reduced trauma, faster recovery, and improved patient outcomes.

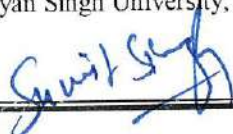
- 2) **Enhanced Recovery After Surgery (ERAS):** Understanding the concept of ERAS protocols, which involve a multidisciplinary approach to optimize patient preparation, surgical techniques, anaesthesia management, and postoperative care, leading to shorter hospital stays, reduced complications, and enhanced recovery.
- 3) **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.
- 4) **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 improve drug dosing and patient safety during anaesthesia.
- 5) **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.
- 6) **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.
- 7) **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.
- 8) **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.



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## **Practical:-**

### **Minimally Invasive Surgery**

- a) Identification and handling of laparoscopic instruments and accessories.
- b) Demonstration of operating room setup for laparoscopic surgery.
- c) Observation of robotic surgical systems and their components.
- d) Assisting in endoscopic procedures under supervision.
- e) Simulation-based practice of camera navigation and hand-eye coordination.
- f) Preparation and troubleshooting of insufflation systems.

### **Enhanced Recovery After Surgery (ERAS)**

- a) Preparation of ERAS checklists for common surgical procedures.
- b) Preoperative patient assessment and counseling demonstrations.
- c) Documentation of perioperative optimization measures.
- d) Participation in multidisciplinary ward rounds.
- e) Monitoring and recording postoperative recovery parameters.
- f) Case-based discussions on ERAS implementation.

### **Patient Safety in the Operating Room**

- a) Demonstration of WHO Surgical Safety Checklist.
- b) Performing preoperative equipment safety checks.
- c) Surgical site infection prevention techniques.
- d) Sterility maintenance and aseptic practices.
- e) Participation in simulation drills for critical incidents.
- f) Reporting and analysis of operating room safety events.

### **Advances in Anaesthetic Techniques**

- a) Preparation and administration principles of TIVA systems.
- b) Demonstration of Target-Controlled Infusion (TCI) pumps.
- c) Interpretation of BIS monitor readings.
- d) Observation and setup of CNAP monitoring systems.
- e) Use of peripheral nerve stimulators for neuromuscular monitoring.

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- f) Documentation of anaesthesia records using advanced monitoring data.

### **Perioperative Pain Management**

- a) Preparation of multimodal analgesia plans.
- b) Identification of regional anaesthesia equipment.
- c) Observation of ultrasound-guided nerve block techniques.
- d) Pain assessment using validated pain scales.
- e) Monitoring effectiveness and adverse effects of analgesics.
- f) Preparation and management of PCA (Patient-Controlled Analgesia) devices.

### **Advances in Imaging Technology**

- a) Identification and operation of intraoperative ultrasound equipment.
- b) Demonstration of image-guided navigation systems.
- c) Interpretation of 3D reconstructed surgical images.
- d) Participation in surgical planning using imaging modalities.
- e) Observation of image-guided interventions.
- f) Documentation of imaging findings relevant to surgical procedures.

### **Surgical Innovation and Emerging Technologies**

- a) Demonstration of 3D-printed anatomical models.
- b) Familiarization with virtual reality (VR) surgical simulators.
- c) Exposure to augmented reality (AR) applications in surgery.
- d) Observation of artificial intelligence-based decision support systems.
- e) Case discussions on emerging surgical technologies.
- f) Presentation on current innovations in surgery and anaesthesia.

### **Advances in Endoscopic Procedures**

- a) Identification and handling of advanced endoscopic instruments.
- b) Observation of Single-Incision Laparoscopic Surgery (SILS).
- c) Demonstration of Natural Orifice Transluminal Endoscopic Surgery (NOTES).
- d) Familiarization with advanced endoscopic imaging techniques.

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- e) Assisting in preparation and maintenance of endoscopic equipment.
- f) Recording and reporting findings from endoscopic procedures.

**Reference Books:-**

1. Miller's Anaesthesia by *Michael A. Gropper, Lars I. Eriksson, Lee A. Fleisher, Jeanine P. Wiener-Kronish, and Neal H. Cohen*
2. Enhanced Recovery After Surgery: A Complete Guide to Optimizing Outcomes by *Olmo Lualdi*
3. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
4. Anesthetic Monitoring: Principles and Practice by *Jan Ehrenwerth, James B. Eisenkraft, and Charles W. Berry*
5. Artificial Intelligence in Surgery: Understanding the Role of AI in Surgical Practice by *Daniel A. Hashimoto*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	2	-	-	-	-	-	3
CO2	3	3	3	2	1	3	-	-	3	2	2	3
CO3	2	2	3	2	2	3	3	1	2	1	-	2
CO4	3	3	2	3	3	3	-	-	-	-	-	3
CO5	3	3	2	2	2	3	-	-	1	-	-	2
CO6	2	2	1	3	3	2	-	-	-	-	-	3

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## BAOTT-504: Disaster Management & Environmental Sciences

### Learning Objectives

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.

### Course Outcome:

- CO1: Remember** terms and components of robotic surgery, ERAS protocols, TIVA, BIS monitoring, and advanced imaging.
- CO2: Understand** the principles of multimodal analgesia, multidisciplinary ERAS workflows, and artificial intelligence in surgical support.
- CO3: Apply** surgical safety checklists, infection prevention protocols, and specialized monitoring devices (BIS, CNAP, neuromuscular).
- CO4: Analyze** emerging technologies like 3D printing, virtual reality, intraoperative ultrasound, and image-guided navigation for surgical planning.
- CO5: Evaluate** Anaesthesia depth, drug dosing accuracy, and opioid consumption to maximize patient safety and recovery.
- CO6: Create** a modern perioperative care template combining minimally invasive methods, advanced monitoring, and enhanced recovery protocols.



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## Course Contents:-

### 1) Disaster preparedness and management

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

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

### 2) Environmental science

- a) **Water**- safe water, reservoir , Water pollution, Water related diseases, Purification of water
- b) **Air** - Composition of air, Air pollution
- c) Environment protection act
- d) Noise pollution
- e) Radiation & Its hazards
- f) Housing and health
- g) Disposal of solid waste-solid, liquid & biochemical waste
- h) Disposal of liquid waste
- i) Disposal of biochemical waste
- j) Sanitation & general hygiene

## Reference Books:-

1. Introduction to International Disaster Management by *Damon P. Coppola*
2. Textbook of Environmental Studies for Undergraduate Courses by *Erach Bharucha*
3. Disaster Medicine by *David E. Hogan and Jonathan L. Burstein*
4. Environmental Engineering and Sanitation by *Joseph A. Salvato, Nelson L. Nemerow, and Franklin J. Agardy*
5. Healthcare Waste Management: A Practical Guide by *World Health Organization (WHO)*

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CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	2	-	3	-	-	2	1	-	2
CO2	2	2	2	2	1	3	-	1	3	2	3	2
CO3	3	1	-	2	-	3	3	-	-	-	-	2
CO4	2	1	2	2	1	3	3	-	-	-	-	2
CO5	2	2	2	-	-	3	3	-	1	1	-	2
CO6	2	2	3	2	1	3	3	1	2	-	-	2

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## SIXTH SEMESTER

### BAOTT-601: Specialized Anaesthesia-2

#### Learning Objectives

Upon completion of this course, students will be able to understand anesthesia principles and management strategies for cardiovascular, thoracic, and neurosurgical procedures. They will develop competence in hemodynamic monitoring, central venous catheterization, arterial line insertion, and the application of infection control measures. Students will gain knowledge of anesthesia techniques for cardiac bypass, valve replacement, and thoracic surgeries, including the management of cardiopulmonary bypass and perioperative hemodynamic changes. They will also understand neuro-anesthesia practices, including patient positioning, intracranial pressure management, total intravenous anesthesia (TIVA), and neurophysiological monitoring, to ensure patient safety and optimize surgical outcomes.

#### Course Outcome:-

- CO1: Remember** anesthetic protocols, specialized monitoring devices, and invasive line insertion routes (IJV, Femoral, PICC, Subclavian) for cardiothoracic and neurosurgeries.
- CO2: Understand** principles of cardiopulmonary bypass, hemodynamic shifts (hypotension /hypertension), intracranial pressure regulation, and neurophysiological monitoring.
- CO3: Apply** manual clinical workflows for Allen's test, TEE observation, central venous line placement, and arterial line insertion techniques using simulation manikins.
- CO4: Analyze** intraoperative data from pulse oximetry, capnography, and continuous pressure readings to recognize immediate shifts in patient vital signs.
- CO5: Evaluate** dynamic physiological changes during brain, spine, valve replacement, and lung resection surgeries to guide precise TIVA and fluid management adjustments.
- CO6: Create** an advanced Anaesthesia monitoring plan coordinating specialized positioning, central access, and target-driven stability metrics for high-acuity surgical procedures.

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## Course Contents:-

### Specialized Anaesthesia-2

- 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.
- 2) **Central Venous catheter and various insertions techniques:** IJV, Femoral, PICC and subclavian
- 3) **Arterial Line insertion** and various techniques (including Allen's test)
- 4) **Anaesthesia 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.
- 5) **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.
- 6) **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.
- 7) **Neuro-Anaesthesia 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.

### Practical- Specialized Anaesthesia-2:

- 1) 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.
- 2) 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.

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- 3) Arterial Line Insertion and skills: A hands-on session with simulation models or manikins to explore the stages needed and practice aseptic skills.
- 4) Cardiac Bypass and Valve Replacement Anaesthesia Techniques
- 5) Case studies and video presentations illustrate the anaesthesia techniques and considerations unique to cardiac bypass and valve replacement procedures.
- 6) Scenarios concentrate on the management of hemodynamic changes after cardiac procedures, such as preserving cardiopulmonary stability and dealing with probable consequences.
- 7) During cardiac bypass procedures, role-playing exercises are used to simulate communication and cooperation among the Anaesthesia team, perfusionists, and surgeons.
- 8) 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.
- 9) 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.
- 10) Simulation scenarios concentrating on intracranial pressure management and cerebral ischemia prevention during neurosurgery procedures.
- 11) Neuro-Anaesthesia 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.

#### Reference Books:-

1. Kaplan's Cardiac Anaesthesia: Devices, Extracorporeal Circulation, and ICU Management by *Joel A. Kaplan*
2. Core Topics in Thoracic Anaesthesia by *Michael Slinger*
3. Cottrell and Patel's NeuroAnaesthesia by *James E. Cottrell and Piyush Patel*
4. Essentials of NeuroAnaesthesia by *Hemanshu Prabhakar*
5. Handbook of Clinical Anaesthesia by *Paul G. Barash, Bruce F. Cullen, Robert K. Stoelting, Michael K. Cahalan, M. Christine Stock, and Rafael Ortega*

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CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	3	-	-	1	-	-	2
CO2	3	3	2	2	3	3	1	-	-	-	-	2
CO3	3	3	2	3	3	3	-	-	2	-	-	2
CO4	3	3	2	3	3	3	-	-	-	-	-	2
CO5	3	2	2	3	3	3	-	-	1	-	-	2
CO6	3	3	2	2	2	3	-	-	-	-	-	2

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## BAOTT-602: Specialized Surgery-2

### Learning Objectives

Upon completion of this course, students will be able to understand the pathophysiology and surgical management of common cardiovascular, thoracic, congenital cardiac, and neurosurgical disorders. They will gain knowledge of major surgical procedures, including CABG, valve replacement, thoracotomy, lung resection, craniotomy, spinal fusion, and tumor excision. Students will develop competence in anesthesia considerations, patient positioning, intraoperative monitoring, and perioperative management using techniques such as ECG, arterial pressure monitoring, transesophageal echocardiography (TEE), and neurophysiological monitoring. They will also be able to recognize, prevent, and manage perioperative complications to ensure patient safety and optimize surgical outcomes.

### Course Outcome:

- CO1: Remember** the nomenclature, anatomical sites, and structural pathology of coronary, valvular, aortic, congenital cardiac, pulmonary, and peripheral artery diseases.
- CO2: Understand** the clinical principles and indications for open versus minimally invasive procedures like CABG, PCI, ablation, pacemaker implantation, and peripheral bypasses.
- CO3: Apply** anatomical orientation frameworks and safety protocols required to prepare instrumentation for valve repairs, aneurysm repairs, and thoracic resections.
- CO4: Analyze** procedural variations distinguishing different types of lung surgeries and congenital defect repairs.
- CO5: Evaluate** surgical risk factors and clinical device choices to ensure optimal setup compatibility.
- CO6: Create** a comprehensive perioperative surgical management protocol and checklist parameters for complex cardiothoracic and vascular surgeries.

### Course Contents

#### Specialized Surgery-2

##### 1) Diseases in CTVS:

- a) Coronary Artery Disease: Narrowing or blockage of the coronary arteries supplying blood to the heart. Surgeries include:
- b) Coronary Artery Bypass Grafting (CABG): Surgical procedure to bypass the blocked or narrowed coronary arteries using grafts from other blood vessels.

- c) Percutaneous Coronary Intervention (PCI): Minimally invasive procedure to open blocked coronary arteries using balloon angioplasty and stent placement.
- d) Valvular Heart Disease: Dysfunction or damage to the heart valves. Surgeries may include:
  - i. Valve Repair: Restoration of the valve structure and function through surgical techniques.
  - ii. Valve Replacement: Surgical removal of the damaged valve and implantation of a prosthetic valve.
- e) Aortic Aneurysm: Abnormal enlargement of the aorta, the main blood vessel supplying blood to the body. Surgeries include:
- f) Aneurysm Repair: Surgical repair of the weakened or enlarged section of the aorta, often through open surgery or endovascular stent grafting.
- g) Congenital Heart Defects: Structural abnormalities in the heart present at birth. Surgeries depend on the specific defect and may include:
- h) Cardiac Defect Repair: Surgical correction of congenital heart defects, such as atrial septal defect (ASD), ventricular septal defect (VSD), or Tetralogy of Fallot.
- i) Arrhythmias: Abnormal heart rhythms. Surgeries may include:
  - i. Pacemaker Implantation: Surgical placement of a device that helps regulate the heart's electrical activity.
  - ii. Ablation Procedures: Minimally invasive techniques to destroy or isolate abnormal electrical pathways in the heart.
- j) Lung Cancer: Malignant tumors in the lungs. Surgeries for lung cancer include:
  - i. Lobectomy: Surgical removal of a lobe of the lung.
  - ii. Pneumonectomy: Surgical removal of an entire lung.
  - iii. Wedge Resection: Surgical removal of a small, localized portion of the lung.
- k) Peripheral Artery Disease (PAD): Narrowing or blockage of arteries outside the heart, typically in the legs. Surgeries may include:
- l) Peripheral Artery Bypass: Surgical creation of a bypass using a graft to restore blood flow to the affected area.
- m) Angioplasty and Stenting: Minimally invasive procedures to open blocked arteries and place stents to maintain blood flow.

  
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- n) Deep Vein Thrombosis (DVT): Formation of blood clots in deep veins, commonly in the legs. Surgeries may involve:
- i. Thrombectomy: Surgical removal of the blood clot from the affected vein.
  - ii. Vein Bypass: Surgical creation of a bypass using a graft to redirect blood flow around the blocked vein.
- 2) 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.
- 3) 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.
- 4) 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).
- 5) Anesthetic considerations and techniques for CTVS and neurosurgery: Understanding the unique Anaesthesia considerations, monitoring techniques, and management strategies for patients undergoing CTVS and neurosurgical procedures, including hemodynamic stability, fluid management, and neurophysiological monitoring.
- 6) 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.
- 7) 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.

#### Practicals-

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

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- i. 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.
- ii. Simulation-based training on patient positioning and draping techniques for different CTVS procedures, including CABG, valve replacement, and lung resection.
- iii. Role-playing exercises to simulate communication and coordination among the surgical team, including anesthesiologists, surgeons, perfusionists, and nurses during CTVS procedures.

**b) Neurosurgical Procedures:**

- i. Practical session on the instrumentation used in neurosurgical procedures, including the placement of horseshoe headrests, cranial pins, and stereotactic devices.
- ii. 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.
- iii. Interactive discussions on the role of different instruments and equipment used in neurosurgery, including microscopes, drill systems, and neuro-endoscopes.
- iv. Anesthetic Considerations and Techniques for CTVS and Neurosurgery:
- v. Case-based discussions and interactive sessions on the unique Anaesthesia considerations for CTVS and neurosurgical procedures, such as preoperative assessment, airway management, and selection of anesthetic agents.
- vi. Simulation scenarios to practice anesthetic techniques specific to CTVS and neurosurgery, including induction and maintenance of Anaesthesia, hemodynamic management, and optimization of cerebral perfusion.
- vii. Role-playing exercises to simulate communication and coordination between the Anaesthesia team and surgical team during CTVS and neurosurgical cases.

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

- i. 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.

  
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- ii. Case discussions and interactive sessions on the significance of intraoperative monitoring data and its role in decision-making during CTVS and neurosurgical procedures.
- iii. Hands-on practice with simulation models or manikins to understand the proper placement and troubleshooting of monitoring devices commonly used in CTVS and neurosurgery.
- iv. Perioperative Management of Complications in CTVS and Neurosurgical Procedures:
- v. 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.
- vi. Simulation-based training on managing hemodynamic instability, intraoperative bleeding, and neurologic complications in a simulated environment.
- vii. Role-playing exercises to practice effective communication, teamwork, and crisis management skills during perioperative complications in CTVS and neurosurgery.

#### Reference Books:-

1. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
2. Alexander's Care of the Patient in  Kirklin/Barratt-Boyes Cardiac Surgery by *Nicholas T. Kouchoukos, Eugene H. Blackstone, Frank L. Hanley, and James K. Kirklin*
3. Shields' General Thoracic Surgery by *Joseph LoCicero III, Hiran C. Fernando, Gaetano Rocco, and Carolyn E. Reed*
4. Rutherford's Vascular Surgery and Endovascular Therapy by *Anton N. Sidawy and Bruce A. Perler*
5. Surgery by *Jane C. Rothrock*

#### CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	2	-	-	1	-	-	2
CO2	3	2	2	2	2	3	-	-	-	-	-	2
CO3	3	3	2	2	3	3	1	-	2	-	-	2
CO4	3	3	2	2	3	3	1	-	2	-	-	2
CO5	3	3	2	3	3	3	-	-	-	-	-	2
CO6	3	3	2	3	2	3	-	-	2	1	-	2

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## **BAOTT-603: Specialized Anaesthesia & Surgery 3**

### **Learning Objectives**

Upon completion of this course, students will be able to understand the principles and applications of robotic-assisted surgery, advanced monitoring technologies, and non-operating room anesthesia (NORA). They will gain knowledge of the use of BIS, neuromuscular monitoring (NMT), ultrasound, and navigation systems in anesthesia practice and patient care. Students will develop competence in anesthesia management for procedures performed outside the operating room, including sedation, regional anesthesia, and critical care interventions. They will also understand the perioperative management of organ transplantation, including preoperative assessment, immunosuppression strategies, postoperative care, and the multidisciplinary approach required to optimize patient outcomes and ensure patient safety.

### **Course Outcomes**

- CO1: Remember** terms, professional roles, and monitoring systems (BIS, NMT, Ultrasound, Navigation) used in robotic and NORA settings.
- CO2: Understand** principles of NORA, robotic prostatectomy/hysterectomy, pneumoperitoneum management, and remote pediatric Anaesthesia.
- CO3: Apply** positioning, sedation protocols, nerve blocks, epidurals, and radiation safety steps across remote procedural areas.
- CO4: Analyze** procedural requirements to differentiate management in interventional radiology, endoscopy, cardiac catheterization, and bronchoscopy.
- CO5: Evaluate** contrast safety, pediatric risk indices, radiation doses, and equipment calibration data to ensure quality assurance.
- CO6: Create** a safety management and tracking checklist coordinating equipment setup and crisis preparedness for robotic and NORA cases.

### **Course Contents:-**

#### **Specialized Anaesthesia & Surgery-3**

- 1) **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.

- 2) **Anaesthetic considerations and techniques for robotic surgeries:** Understanding the Anaesthesia considerations specific to robotic-assisted surgeries, including patient positioning, pneumoperitoneum management, and anaesthetic agents and techniques suitable for these procedures.
- 3) **BIS, NMT, Ultrasound, Navigation.**
- 4) **NORA (Non-Operative Room Anaesthesia)** is a field within Anaesthesia that focuses on providing Anaesthesia services outside the traditional operating room setting. Here are some potential topics related to NORA:
- a) **Introduction to NORA:** Overview of Non-Operative Room Anaesthesia, its scope, and its role in modern Anaesthesia practice.
  - b) **Procedures in Non-Operative Settings:** Anesthetic management for various procedures performed outside the operating room, such as interventional radiology, endoscopy, cardiac catheterization, and bronchoscopy,
  - c) **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.
  - d) **Sedation Techniques:** Techniques and protocols for sedation in non-operating room settings, including patient assessment, drug selection, monitoring, and managing complications.
  - e) **Pediatric NORA:** Special considerations and techniques for providing Anaesthesia to pediatric patients in non-operating room settings, including sedation for imaging studies, dental procedures, and emergency department interventions.
  - f) **Regional Anaesthesia in NORA:** The use of regional Anaesthesia techniques, such as nerve blocks and epidurals, in non-operating room settings for pain management and surgical procedures.
  - g) **Critical Care Anaesthesia 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.
  - h) **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.

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- i) **Teamwork and Communication:** Effective collaboration and communication among Anaesthesia providers, proceduralists, and other healthcare professionals involved in NORA to optimize patient care and outcomes.
  - j) **Equipment and Resources:** Considerations for equipment, resources, and infrastructure needed to provide safe and efficient Anaesthesia care in non- operating room settings, including portable Anaesthesia machines, monitoring devices, and emergency equipment.
  - k) **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.
- 5) **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.
  - 6) **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 -
  - 7) **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.

**Practical:**

**Specialized Anaesthesia & Surgery-3**

**1) Robotic-Assisted Surgical Procedures:**

- a) Demonstration and hands-on practice with robotic surgical systems, such as da Vinci Surgical System, including instrument docking, console operation, and manipulation of robotic arms.
- b) 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.
- c) Interactive discussions on patient positioning considerations, pneumoperitoneum management, and the role of Anaesthesia in facilitating robotic-assisted procedures.

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

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

**3) Non-Operative Room Anaesthesia (NORA):**

- a) Case-based discussions and interactive sessions on the different procedures performed in non-operating room settings, including interventional radiology, endoscopy, and cardiac catheterization.
- b) Simulation-based training on sedation techniques in non-operating room settings, focusing on patient assessment, drug selection, monitoring, and management of sedation-related complications.
- c) Practical sessions on radiation safety protocols, infection control measures, and communication/documentation practices specific to NORA procedures.

**4) Organ Transplantation Procedures:**

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

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### 5) Preoperative Evaluation and Management of Transplant Recipients:


- a) Case discussions and interactive sessions on the preoperative assessment and management of transplant recipients, including organ allocation, cross-matching, and immunological considerations.
- b) Hands-on training on laboratory techniques used in transplant medicine, such as HLA typing and cross-matching tests.
- c) Interactive sessions on ethical considerations in organ transplantation, including organ donation, allocation policies, and patient selection criteria.

### 6) Postoperative Care and Immunosuppression in Transplant Surgeries:

- a) 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) Simulation-based training on infection prevention strategies for transplant recipients, focusing on identifying and managing postoperative infectious complications.
- c) Role-playing exercises to simulate long-term follow-up care scenarios for transplant recipients, including monitoring graft function, managing complications, and promoting adherence to immunosuppressive therapies.

### Reference Books:-

1. Non-Operating Room Anaesthesia by *Mark S. Weiss and Lee A. Fleisher*
2. Robotic Surgery: Principles and Practice by *Farid Gharagozloo, Robert Poston, and Shanda H. Blackmon*
3. Surgical Technology: Principles and Practice by *Joanna Kotcher Fuller*
4. Anesthetic Monitoring: Principles and Practice by *Jan Ehrenwerth, James B. Eisenkraft, and Charles W. Berry*
5. Radiation Safety in Imaging Departments by *Mary Alice Statkiewicz Sherer, Paula J. Visconti, and E. Russell Ritenour*

  
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CO-PO Mapping:-

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	2	-	-	-	-	-	3
CO2	-	-	2	-	-	2	-	1	3	3	2	2
CO3	3	3	2	3	3	3	-	-	1	-	-	2
CO4	2	3	2	2	3	3	-	-	2	1	-	2
CO5	3	3	2	3	2	3	1	-	2	-	-	2
CO6	3	2	2	2	-	3	1	-	-	-	-	2

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## BAOTT-604: Research Methodology and Biostatistics

### Learning Objectives

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.

### Course Outcome:

- CO1: Remember** research definitions, types of design, measurement scales, biostatistics terms, and formatting structures for scientific documents.
- CO2: Understand** principles of sampling, differences between questionnaires and schedules, errors in measurement, and probability distributions.
- CO3: Apply** graphical representation principles to draw histograms, frequency polygons, and normal curves for medical data tabulation.
- CO4: Analyze** datasets by calculating measures of central tendency (mean, median, mode) for grouped and ungrouped data.
- CO5: Evaluate** standard deviations, standard errors, and divergence from normality to interpret medical parameters and estimates.
- CO6: Create** a structured research proposal containing a defined problem statement, sampling design, and biostatistical protocol.

### Course Contents:- Research Methodology and Biostatistics

- 1) **Introduction to Research Methodology:** Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology.

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- 2) **Identifying Research Problem:** Statement of research problem. Statement of purpose and objectives of research problem, Necessity of defining the problem.
- 3) **Research Design:** Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design
- 4) **Sampling Design:** Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design
- 5) **Measurement & scaling techniques:** Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.
- 6) **Type Of Data & Methods of data collection:** collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
- 7) **Format of scientific documents:**Format of research proposal, Structure of protocols, formats reporting in scientific journals, systematic reviews, research paper, short communication.
- 8) **Developing A Research Proposal & Basic Concept Of Biostatistics:** Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and medical &health science, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types
- 9) **Tabulation of Data:** Basic principles of graphical representation, Types of diagrams: histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, and normal frequency curve.
- 10) **Measure of Central Tendency:** Need for measures of central Tendency  
**Mean:** Definition and calculation of mean of ungrouped and grouped  
**Median:** Meaning, interpretation and calculation of median ungrouped and grouped data.  
**Mode:** Meaning and calculation of mode, Comparison of the mean, median and mode
- 11) **Probability and Standard Distributions:** Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality: skew ness, kurtosis. Standard Deviation (SD) & Standard Error (SE).

#### Reference Books:-

1. Research Methodology: Methods and Techniques by *C.R. Kothari and Gaurav Garg*
2. Methods in Biostatistics: For Medical Students and Research Workers by *B.K. Mahajan*

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*Sumit Singh*

*Arkit*

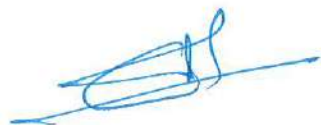
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3. Biostatistics: A Foundation for Analysis in the Health Sciences by *Wayne W. Daniel and Chad L. Cross*
4. Introduction to Biostatistics and Research Methods by *P.S.S. Sundar Rao and J. Richard*
5. How to Write and Publish a Scientific Paper by *Robert A. Day and Barbara Gastel*

**CO-PO Mapping:-**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	2	-	-	-	1	-	-	-	3
CO2	2	-	1	3	1	-	-	2	-	-	-	3
CO3	2	2	2	3	2	-	-	2	-	-	-	2
CO4	-	-	1	2	-	-	-	3	-	3	-	2
CO5	3	-	-	3	2	-	-	-	-	-	-	2
CO6	3	-	2	3	3	-	-	-	-	-	-	2



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## 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 the classroom and clinical instruction. The students are expected to work for a minimum of 8 hours per day, and this may be more depending on the need and the healthcare setting.

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

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## BAOTT INTERNSHIP LOGBOOK PROFORMA

Institute Name & Logo

Logbook for BAOTT Internship Program

Student Name .....

Year & Month .....

Regd. No. ....

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**BIODATA OF THE STUDENT**

Name	
D.O. B	
Parents Name	
Regd. No	
Year of Passing 10+2	
Date of Joining BAOTT	
Date of completion of Final Semester	
Permanent Address	
Postal Address	
Mobile No. of Student	

  
Manoj Kumar



Sumit Singh  




### Guidelines for Logbook Entry Outcome:

**Outcome: Morbidities/ 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
3. In an emergency OT posting, the logbook will be countersigned by the Senior Resident on duty.
4. The logbook is to be submitted through the Professor /Associate Professor at the time of the final examination.
5. Please use clear handwriting for filling the Logbook.

**NOTE- Duration 12 months**

### Protocol for Internship Postings

Department/Area of Posting	Nature of Posting	Duration of Posting
Anaesthesia 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 & Orthopedics OT	Regular	1 Month
CSSD	Regular	1 Month
Robotic Surgery	Regular	1 Month

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**Logbook Proforma: (B.AOTT INTERNSHIP)**

Area of Posting.....

Period: From .....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						

*[Handwritten Signature]*

Course Coordinator Signature: .....

*Manoj Kumar*  
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## **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:**

1. Educative assessment/Assessment for learning: Assessment of the internees on daily basis during internship and postings should done by the Head of the Department. Objective – To develop minimum professional skills. Maintaining Log book by internees
2. 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.

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.

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*Arvind*

*Sanjay*

*Sanjay*

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 the University/Institute
- b) Total leave allowed – Maximum 30 days during the whole one year of internship
- c) Maximum leave allowed at a time: 10 days.

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### 3. Communication:

- a) Communicate relevant information to the Anaesthesia 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.

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Performance Criteria	Indicators		
	Knowledge	Skill	Behavior
<ul style="list-style-type: none"> <li>• <b>Capability to Anticipate and Prepare:</b></li> </ul>	<ul style="list-style-type: none"> <li>• Should have in depth knowledge about various general health conditions while examination</li> <li>• Should have essential knowledge about providing care to each individual who visits to your hospital</li> <li>• Should be aware of different types of disabilities and information on patients with additional needs</li> <li>• Should have essential knowledge about rights and dignity of the patients</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in assisting surgeons/anaesthetist with equipment's, machines instruments, and suturing.</li> <li>• Competence in aiding anesthetists with Anaesthesia induction, airway management, and vital sign monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>• Proactive attitude in preparing for procedures and anticipating the needs of the surgical team/Anaesthesia team.</li> <li>• Attention to detail, ensuring proper organization of instruments and supplies.</li> <li>• Effective time management and collaboration with the surgical team.</li> <li>• Adaptability to handle unexpected situations and adjustments during surgery.</li> <li>• Professionalism, including confidentiality, ethical conduct, and respect for boundaries.</li> </ul>

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• **Maintaining a strict sterile technique**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <ul style="list-style-type: none"> <li>• Thorough understanding of the principles of aseptic technique and sterile field maintenance.</li> <li>• Knowledge of infection control guidelines, including hand hygiene, proper gowning and gloving techniques, and disinfection protocols.</li> <li>• Familiarity with different types of sterilization methods, such as steam sterilization, ethylene oxide sterilization, and sterile packaging</li> </ul> | <ul style="list-style-type: none"> <li>• Proficiency in performing hand hygiene using appropriate handwashing or hand sanitization methods.</li> <li>• Competence in donning sterile gowns and gloves without contaminating them and in maintaining sterility while working within the sterile field.</li> <li>• Skill in handling sterile instruments, supplies, and drapes to prevent contamination and maintain a sterile environment.</li> <li>• Ability to assist surgeons and anesthetists in maintaining sterility during procedures, such as passing instruments or opening sterile packages</li> </ul> | <ul style="list-style-type: none"> <li>• Diligently adhering to the recommended gowning and gloving procedures to protect oneself and the patient.</li> <li>• Pay close attention to protecting the sterile field's integrity by limiting air circulation, preventing needless movements, and contaminating it with non-sterile things.</li> <li>• Strict adherence to sterile procedure during instrument handling, making sure that instruments stay in the sterile field and maintaining the proper sterile instrument passes.</li> <li>• Addressing any breaches of sterile technique or potential contamination as soon as possible, taking corrective action, and, as necessary, informing the surgical team.</li> <li>• Maintaining sterility during the procedure with constant attention and awareness while aggressively looking out for any potential breaks or compromises.</li> </ul> |
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**Competencies Statement**

<ul style="list-style-type: none"> <li>• <b>Instrumentation and Equipment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of surgical instruments and their uses.</li> <li>• Familiarity with medical equipment, such as Anaesthesia machines and monitors.</li> <li>• Knowledge of equipment setup and placement.</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in handling surgical instruments and ensuring their sterility.</li> <li>• Ability to set up and place medical equipment accurately.</li> <li>• Skill in operating equipment and adjusting settings.</li> <li>• Troubleshooting abilities for equipment malfunctions.</li> </ul>	<ul style="list-style-type: none"> <li>• Continuously update knowledge of instruments and equipment.</li> <li>• Ensure instruments are clean and organized.</li> <li>• Double-check equipment setup for patient safety.</li> <li>• Communicate effectively with surgeons and anaesthetists.</li> <li>• Promptly address equipment issues during procedures.</li> <li>• Collaborate with appropriate personnel for complex troubleshooting.</li> </ul>
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<ul style="list-style-type: none"> <li>• <b>Surgical Assistance</b></li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of surgical procedures, including laparoscopic, arthroscopic, and robotic techniques.</li> <li>• Knowledge of different surgical instruments, sutures, and their uses.</li> <li>• Familiarity with sterile techniques and maintaining a sterile field.</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in directly supporting the surgeon during procedures.</li> <li>• Ability to anticipate the surgeon's needs and provide timely assistance.</li> <li>• Skill in passing sutures, instruments, and other necessary items accurately.</li> <li>• Competence in scrubbing for more technical procedures like laparoscopic, arthroscopic, and robotic surgeries.</li> </ul>	<ul style="list-style-type: none"> <li>• Adhere to the surgeon's directions promptly and accurately.</li> <li>• Anticipate the surgeon's demands and prepare instruments or sutures in advance.</li> <li>• Maintain clear and open communication with the surgeon throughout the procedure.</li> <li>• Collaborate with the surgical team to ensure effective teamwork.</li> <li>• Demonstrate attentiveness and responsiveness during the surgery.</li> <li>• Continuously enhance knowledge of surgical procedures and instruments.</li> <li>• Adhere to sterile techniques and maintain a sterile environment.</li> </ul>
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<ul style="list-style-type: none"> <li>• <b>Anaesthesia Support</b></li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of Anaesthesia administration and management.</li> <li>• Familiarity with the different stages of Anaesthesia induction and maintenance.</li> <li>• Awareness of monitoring vital signs, oxygen saturation, and end-tidal carbon dioxide levels taking ABG sample, BIS, NMT, Arterial line/CVP line insertion.</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in assisting with the administration and supervision of Anaesthesia.</li> <li>• Ability to assist in securing and positioning patients during anaesthesia induction.</li> <li>• Ability to monitor and assess vital signs, oxygen saturation, and end-tidal carbon dioxide levels.</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborate closely with the anaesthetist, following their instructions and assisting with anaesthesia administration.</li> <li>• Help secure and position patients during anaesthesia induction and throughout the procedure.</li> <li>• Pay close attention to any changes or irregularities in patient conditions.</li> <li>• Promptly communicate any significant changes to the anaesthetist and surgical team.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Emergency Preparedness:</b></li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of emergency procedures and protocols.</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in identifying and accessing emergency equipment quickly</li> </ul>	<ul style="list-style-type: none"> <li>• Proactively learn about emergency procedures and equipment locations.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Knowledge of the locations and functions of emergency equipment/crash carts.</li> <li>• Familiarity with potential postoperative complications and their management.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to remain calm and composed in high- stress situations.</li> <li>• Competence in following established emergency protocols.</li> <li>• Skill in assisting the surgical team during crises or postoperative difficulties.</li> </ul>	<ul style="list-style-type: none"> <li>• Follow established protocols and guidelines for emergency situations.</li> <li>• Assist the surgical team promptly and effectively during crises.</li> <li>• Continuously update knowledge of emergency procedures and best practices.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Ability to manage confidentiality of patient's demographic and medical record data</b></li> </ul>	<ul style="list-style-type: none"> <li>• Should have adequate knowledge of data protection and how this will impact security, access and confidentiality of the patient's records.</li> <li>• Should have essential knowledge to ensure the patient environment will remain safe and user-friendly, in terms of access and facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Conversant in using various digital devices, access cloud storage platforms and saves electronic medical records on system- based software programs and keeps them safe.</li> <li>• Demonstrates how to store and retrieve manual medical records</li> </ul>	<ul style="list-style-type: none"> <li>• Seeks consent of the patient before providing information to external stake holders.</li> <li>• Restricts self from discussing patient information and condition in any open forum/external communication</li> </ul>

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<ul style="list-style-type: none"> <li>• Ability to promote ethical and cordial relationship with other health care professionals</li> </ul>	<ul style="list-style-type: none"> <li>• Should have essential knowledge of how to maintain practice in accordance with other professional health care standards</li> </ul>	<ul style="list-style-type: none"> <li>• Explains the condition that are treatable/correctable beyond your practice standards</li> </ul>	<ul style="list-style-type: none"> <li>• Honesty and understanding of own limitations</li> </ul>
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<ul style="list-style-type: none"> <li>• Ability to handle critical, narcotic drugs</li> </ul>	<ul style="list-style-type: none"> <li>• Should have essential knowledge of how to handle various drugs.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain the record, stock and documentation of drug uses in anaesthesia.</li> </ul>	<ul style="list-style-type: none"> <li>• Should have proper knowledge and protect misuse of drugs.</li> </ul>
<ul style="list-style-type: none"> <li>• Ability to comply with legal, professional and ethical guidelines, law and codes.</li> </ul>	<ul style="list-style-type: none"> <li>• Should have in depth knowledge of ethical practice and standard operating procedures followed in the clinical examination.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Explains the uses of various diagnostic instruments and their importance in the process of examination</li> <li>• Follows the code of conduct set down by the council/ appropriate authorities</li> </ul>	

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## Skills-based outcomes and monitorable indicators for operation theatre technologist

### 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

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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.	Preform 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

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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
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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.	

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12	Monitor and assure quality	Monitor treatment 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.	
13	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. Follow the organization's emergency procedures promptly, calmly, and Efficiently.	100
<b>Total</b>				<b>2270</b>

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Department of Anaesthesia and Operation Theatre Technology

Semester	Course Code	Course Title	Credit		Marks Distribution				Total Marks
			Theory	Practical	IA	UE	IA	UE	
III	AHS AOTT GEC 231	General Principles & Practice of Public Health	4	-	20	80	-	-	100
IV	AHS AOTT GEC 241	Basic Life Support & Emergency Care	4	-	20	80	-	-	100

**Course Code: AHS AOTT GEC 231**

**Credits: 4**

**Name of Course: General Principles & Practice of Public Health**

**COURSE DESCRIPTION**

This course introduces students to the fundamental concepts, principles, and practices of public health. It focuses on disease prevention, health promotion, environmental sanitation, epidemiology, nutrition, communicable and non-communicable diseases, national health programs, and community participation in healthcare. The course aims to develop an understanding of population health and the role of healthcare professionals in improving community well-being.

**COURSE OBJECTIVES**

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

1. Understand the concepts and scope of public health.
2. Explain determinants of health and disease.
3. Describe epidemiological methods used in public health.
4. Understand communicable and non-communicable disease prevention strategies.

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5. Explain environmental and occupational health principles.
6. Discuss nutrition, health education, and health promotion.
7. Understand national health programs and healthcare delivery systems.
8. Apply public health principles in community healthcare settings.

### **UNIT I: INTRODUCTION TO PUBLIC HEALTH**

Concept and Definition of Public Health, History and Evolution of Public Health, Scope and Importance of Public Health, Determinants of Health, Biological Factors, Environmental Factors, Social and Economic Factors, Lifestyle Factors, Concepts of Health and Disease, Levels of Prevention, Primordial Prevention, Primary Prevention, Secondary Prevention, Tertiary Prevention, Health Indicators

### **UNIT II: EPIDEMIOLOGY AND DISEASE PREVENTION**

Introduction to Epidemiology, Epidemiological Triad, Natural History of Disease, Measures of Disease Frequency, Incidence, Prevalence, Mortality, Morbidity, Disease Surveillance, Outbreak Investigation, Screening and Diagnostic Tests, Vaccination and Immunization

### **UNIT III: COMMUNITY HEALTH AND NATIONAL HEALTH PROGRAMS**

Primary Health Care (PHC), Healthcare Delivery System in India, Rural and Urban Health Services, National Health Mission (NHM), Reproductive and Child Health (RCH), Universal Immunisation Programme (UIP), Tuberculosis Control Programme, National AIDS Control Programme, Non-Communicable Disease Control Programs, Role of Healthcare Professionals in Public Health

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**Course Code: AHS AOTT GEC 241**

**Credits: 4**

**Name of Course: Basic Life Support & Emergency Care**

### **COURSE DESCRIPTION**

This course provides fundamental knowledge and practical skills in emergency care, Basic Life Support (BLS), cardiopulmonary resuscitation (CPR), first aid, patient assessment, airway management, Automated External Defibrillator (AED) use, and emergency pharmacology. Students will develop competency in recognizing and responding to medical emergencies and administering emergency drugs safely under supervision.

### **COURSE OBJECTIVES**

After completing this course, students will be able to:

1. Assess patients using primary and secondary survey techniques.
2. Monitor and interpret vital signs in emergency situations.
3. Apply first aid principles and triage methods.
4. Perform Basic Life Support and CPR according to current guidelines.
5. Manage airway emergencies and provide ventilation support.
6. Operate an Automated External Defibrillator (AED).
7. Demonstrate safe patient handling and transportation techniques.
8. Understand indications, dosage, administration, dilution, and adverse effects of commonly used emergency medications.

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**UNIT I: VITAL SIGNS AND PRIMARY ASSESSMENT**

1. Introduction to Emergency Care, Emergency Medical Services (EMS), Chain of Survival
2. Vital Signs Assessment, Body Temperature, Pulse Rate, Respiratory Rate, Blood Pressure Oxygen Saturation (SpO<sub>2</sub>), Glasgow Coma Scale (GCS)
3. Primary Assessment (ABCDE Approach), Airway, Breathing, Circulation, Disability, Exposure
4. Secondary Assessment, Documentation and Reporting in Emergencies

**UNIT II: BASIC EMERGENCY CARE, FIRST AID AND TRIAGE**

1. Principles of First Aid, Management of Bleeding, Shock and its Management, Burns and Scalds, Fractures and Dislocations, Poisoning and Drug Overdose, Snake Bite and Insect Bite Emergencies,
2. Disaster Management, Principles of Triage, Mass Casualty Incident Management

**UNIT III: BASIC LIFE SUPPORT (BLS) AND CPR**

1. Sudden Cardiac Arrest, Recognition of Cardiac Arrest, Activation of Emergency Response System, Adult Basic Life Support, Pediatric Basic Life Support, Infant Basic Life Support
2. One-Rescuer CPR, Two-Rescuer CPR, High-Quality Chest Compressions, Compression-Ventilation Ratios, Recovery Position

**UNIT IV: BASIC Emergency Drugs: Mode or administration, dilution, dosage and effects**

- a) Adrenaline, Atropine
- b) Ephedrine, Mephentermine
- c) Bicarbonate, calcium, and potassium.
- d) Inotropes: dopamine, dobutamine, amiodarone
- e) Aminophylline, hydrocortisone, Antihistamine,
- f) Antihypertensive –Beta-blockers, Ca-channel blockers.
- g) Antiarrhythmic- Xylocard
- h) Vasodilators- Nitro-glycerine & sodium nitroprusside
- i) Respiratory system- Bronchodilators
- j) Renal system- Diuretics, frusemide, mannitol

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**Department of Anaesthesia and Operation Theatre Technology**  
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**Value Added Courses Syllabus**

**Title of Course: Basic Cardiopulmonary Life Support**

**Course Code: NIAHS-VAC-005**

**Course Objective:** It will sensitize them in basic emergency care, & control with knowledge of BCLS in emergency.

**Syllabi of Course**

**1. Introduction to BCLS**

**(5 Hrs.)**

- Definition and importance of BCLS
- Basic anatomy and physiology of the cardiovascular system
- Chain of survival concept

**2. Recognition of Cardiac Arrest**

**(5 Hrs.)**

- Signs and symptoms of cardiac arrest
- Differentiating between cardiac arrest and other medical emergencies

**3. Basic Life Support Techniques**

**(5 Hrs.)**

- Checking responsiveness and calling for help
- Assessing breathing and airway
- Performing chest compressions
- Providing rescue breathing
- Use of barrier devices (face shields, pocket masks) during rescue breaths

**4. Use of Automated External Defibrillator (AED)**

**(5 Hrs.)**

- Indications and contraindications for AED use
- Proper application of AED pads
- Following AED prompts and instructions

**5. Special Considerations**

**(5 Hrs.)**

- BCLS in special populations (pediatric, geriatric, pregnant patients)
- Modifications in BCLS techniques for infants and children
- Addressing unique challenges in BCLS for different patient demographics

**6. Post-Resuscitation Care**

**(5 Hrs.)**

- Importance of post-resuscitation care
- Recognition and management of potential complications post-resuscitation
- Transfer of care to advanced medical providers

**Suggested Reading**

Morales-Gonzalez, J. A. (Ed.). (2013). Basic Cardiopulmonary Resuscitation Manual.

Pujari, M. S., & Savithri, K. Basic Cardiopulmonary Life Support (BCLS) - A Review.

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**Title of Course: Patient Assessment**

**Course Code: NIAHS-SEC-005**

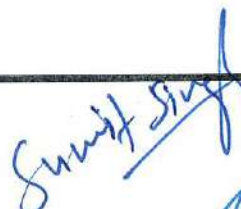
**Course Objective:** It will enhance knowledge of careful assessment of patient before and after treatments.

**Syllabi of Course**

1. Identify principles of history by taking in the assessment process of individuals. **(5 Hrs.)**
2. Conduct a health history, including environmental exposure and a family history that recognizes genetic risks, to identify current and future health problems. **(5 Hrs.)**
3. Demonstrate physical examination skills including focused physical, behavioral, psychological, socioeconomic, and environmental assessments of health and illness parameters in patients, using developmentally and culturally appropriate approaches and according to established criteria. **(5 Hrs.)**
4. Document problems and needs in individuals from data discovered during the health history and physical examination. **(5 Hrs.)**
5. Compare and contrast the roles and responsibilities of the nurse in the process of health assessment and health promotion. **(5 Hrs.)**
6. Demonstrate responsibility for independent learning. **(5 Hrs.)**

**Suggested Reading**

- Guyuron, B. (2011). Patient assessment. Aesthetic Plastic Surgery Video Atlas E-Book, 1.
- Wilson, S. F., & Giddens, J. F. (2020). Health Assessment for Nursing Practice-E-Book. Elsevier Health Sciences.
- Lewis, S. L., Dirksen, S. R., Heitkemper, M. M., Bucher, L., & Camera, I. (2015). Medical-Surgical Nursing-E-Book: Assessment and Management of Clinical Problems, Single Volume. Elsevier Health Sciences.



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24/06/2026

