



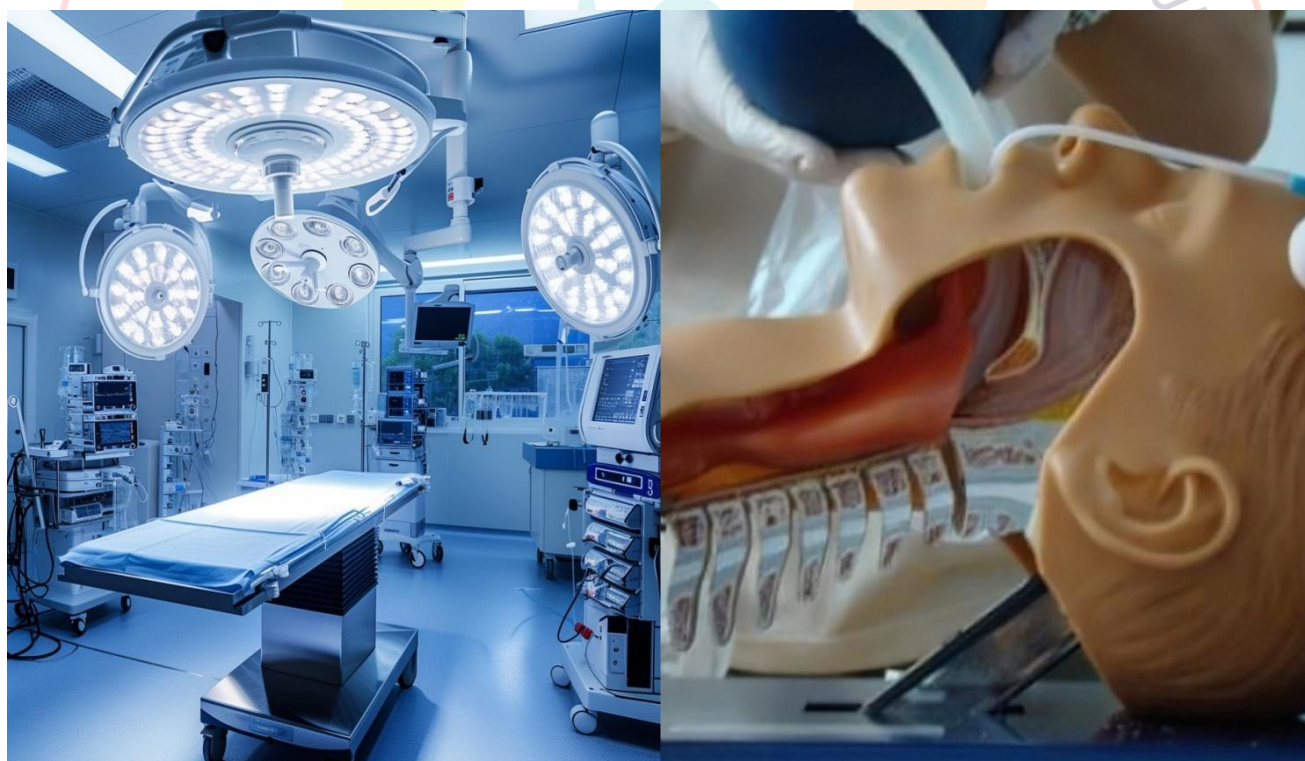
सत्यमेव जयते

National Commission for Allied and Healthcare Professions

COMPETENCY BASED CURRICULUM

for

**“ANAESTHESIA & OPERATION THEATRE
TECHNOLOGY”**



As per the NCAHP Act -2021

APPROVED SYLLABUS 2025

Ministry of Health & Family Welfare





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List of Abbreviations

AED	Automated External Defibrillator
AHP	allied and healthcare Professionals
AIDS	Acquired Immuno Deficiency Disease
BLS	Basic life support
BOTT	Bachelor in Operation Theatre Technology
BMW	Bio Medical Waste
BVM	Bag Value Masks
CATS	Credit Accumulation and Transfer System
CBC	Complete Blood Count
CBCS	Choice-Based Credit System
CbD	Case-based discussion
CEX	Case Evaluation Exercise
CHC	Community Health Centre
CMP	Comprehensive Metabolic Panel
CPR	Cardiopulmonary Resuscitation
CPU	Central Processing Unit
CSF	Cerebrospinal fluid
CSSD	Central Sterile Supplies Department
DH	District Hospital
DOTT	Diploma in Operation Theatre Technology
DOPs	Direct observation of procedures
ECG	Electro cardiogram
ESWL	Extracorporeal shock wave therapy
HIS	Hospital Information System
HOD	Head of Department
HSSC	Healthcare Sector Skill Council
ILO	International Labor Organization
JCI	Joint Commission International
LFT	Liver Function Tests
CEX	Mini Case Evaluation Exercise
NAAC	National Assessment and Accreditation Council
NABH	National Accreditation Board for Hospitals & Healthcare
NCRC	National Curricula Review Committee
NIAHS	National Initiative for Allied and Healthcare Sciences
NSDA	National Skills Development Agency
NSQF	National Skills Qualification Framework
OBG	Obstetrics and Gynecology
OSCE	Objective Structured Clinical Examination
OT	Operation Theatre
OTT	Operation Theatre Technology
OSLER	Objective Structured Long Examination Record
OSPE	Objective Structured Practical Examination
PPE	Personal Protective Equipment

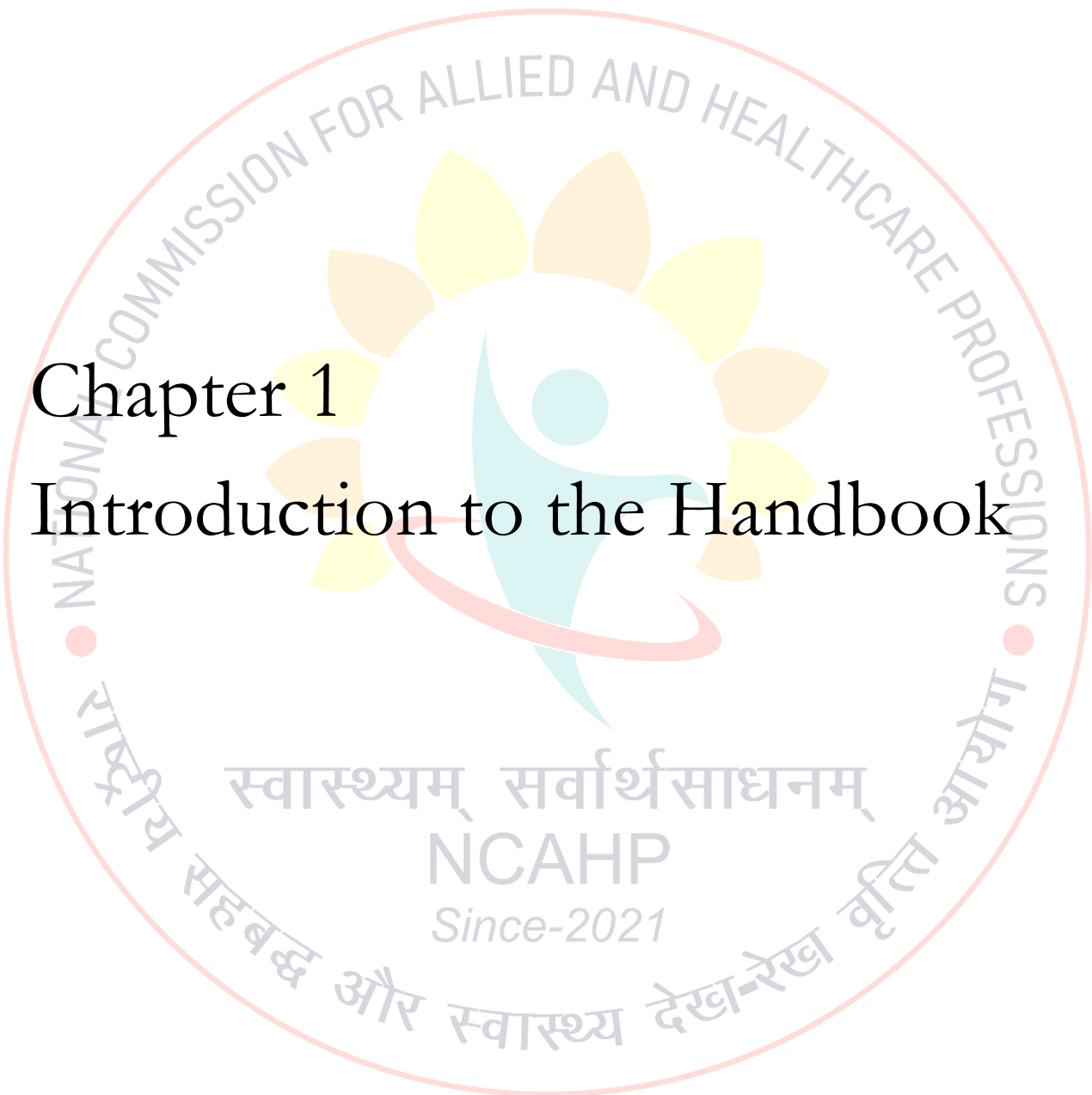
PHC	Primary Health Centre
RFT	Renal Function Tests
SDL	Self-directed learning
SCA	Sudden Cardiac Arrest
SC	Sub Centre
SDH	Sub District Hospital
TFT	Thyroid Function Test
TURP	Transurethral Resection of the Prostate
TURBT	Transurethral Resection of Bladder Tumors
UGC	University Grants Commission
UHC	Universal Health Coverage
WWW	World Wide Web





Chapter 1

Introduction to the Handbook



Chapter 1: Introduction to the Handbook

The report 'From Paramedics to Allied Health Professionals: Landscaping the Journey and Way Forward' that was published in 2012, marked the variance in education and training practices for the allied and healthcare courses offered by institutions across the country. This prompted the Ministry of Health and Family Welfare to envisage the creation of national guidelines for education and career pathways of allied and healthcare professionals, with a structured curriculum based on skills and competencies. Thus, this handbook has been designed to familiarize universities, colleges, healthcare providers as well as educators offering allied and healthcare courses with these national standards.

Individually, created for different professional groups of allied and healthcare, this handbook aims to reduce the variation in education by comprising of a standardized curriculum, career pathways, nomenclature and other details for each profession. The change from a purely didactic approach will create better skilled professionals and improve the quality of overall patient care. Approved by National Commission for Allied & Healthcare Professions (NCAHP) i.e. National standard-setting authority, a statutory regulatory body set up by an Act of Parliament in 2021, this handbook will guide thousands of young adults who choose healthcare as a profession – not as doctors or nurses but to play several other critical roles – on the appropriate course of action to enable them to be skilled allied and healthcare professionals of the future.

Who is an Allied and Healthcare Professional?

The Ministry of Health and Family Welfare, accepted in its entirety the definition of an allied and healthcare professional based on the afore-mentioned report, though the same has evolved after multiple consultations and the recommended definition is now as follows-

'Allied and healthcare professionals (AHPs) includes individuals involved with the delivery of health or healthcare related services, with qualification and competence in therapeutic, diagnostic, curative, preventive and/or rehabilitative interventions. They work in multidisciplinary health teams in varied healthcare settings including doctors (physicians and specialist), nurses and public health officials to promote, protect, treat and/or manage a person(s) physical, mental, social, emotional, environmental health and holistic well-being.'

Since the past few years, many professional groups have been interacting and seeking guidance on all those who would qualify under the purview of "allied and healthcare professionals". In the healthcare system, statutory bodies existed for clinicians, nurses, pharmacists and dental practitioners; but a regulatory structure for around 50 professions was absent in India till 2021 when Government of India established a regulatory body "National Commission for Allied & Healthcare Professions" enacted by an Act of Parliament. The Government has kept these 56 professions (as listed Annex-1) under the ambit of the Allied and Healthcare system and regulated these 56 allied health professionals under 10 different groups by establishing 10 professional councils for each of the group of professions. However, this number is subject to changes and modifications over time, particularly considering how quickly new technologies and new clinical avenues are expanding globally, creating newer cadres of such professionals.

Scope and need for allied and healthcare professionals in the Indian healthcare system

The quality of medical care has improved tremendously in the last few decades due to the advances in technology, thus creating fresh challenges in the field of healthcare. It is now widely recognized that health service delivery is a team effort involving both clinicians and non-clinicians, and is not the sole duty of physicians and nurses.¹ Professionals that can competently handle sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis is now so dependent on technology, that allied and healthcare professionals (AHPs) are vital to successful treatment delivery.

Effective delivery of healthcare services depends largely on the nature of education, training and appropriate orientation towards community health of all categories of health personnel, and their capacity to function as an integrated team. For instance in the UK, more than 84,000 AHPs, with a range of skills and expertise, play key roles within the National Health Service, working autonomously, in multi-professional teams in various settings. All of them are first-contact practitioners and work across a wide range of locations and sectors within acute, primary and community care. Australia's health system is managed not just by their doctors and nurses, but also by the 90,000 university-trained, autonomous AHPs vital to the system.^{2,3}

As the Indian government aims for Universal Health Coverage, the lack of skilled human resource may prove to be the biggest impediment in its path to achieve targeted goals. The benefits of having AHPs in the healthcare system are still unexplored in India. Although an enormous amount of evidence suggests that the benefits of AHPs range from improving access to healthcare services to significant reduction in the cost of care, though the Indian healthcare system still revolves around the doctor-centric approach. The privatization of healthcare has also led to an ever-increasing out-of-pocket expenditure by the population. However, many examples assert the need of skilled allied and healthcare professionals in the system, such as in the case of stroke survivors, it is the support of AHPs that significantly enhance their rehabilitation and long term treatment ensures return to normal life. AHPs also play a significant role to care for patients who struggle mentally and emotionally in the current challenging environment and require mental health support; and help them return to well-being.² Children with communication difficulties, the elderly, cancer patients, patients with long term conditions such as diabetes people with vision problems and amputees; the list of people and potential patients who benefit from AHPs is indefinite.

Thus, the breadth and scope of the allied and healthcare practice varies from one end to another, including areas of work listed below:

- Across the age span of human development from neonate to old age;
- With patients having complex and challenging problems resulting from systemic illnesses such as in the case of diabetes, cardiac abnormalities/conditions and elderly care to name a few;
- Towards health promotion and disease prevention, as well as assessment, management and evaluation of interventions and protocols for treatment;
- In a broad range of settings from a patient's home to community, primary care centers, to tertiary care settings; and
- With an understanding of the healthcare issues associated with diverse socio-economies and cultural norms within the society.

Learning goals and objectives for allied and healthcare professionals

The handbook has been designed with a focus on performance-based outcomes pertaining to different levels. The learning goals and objectives of the undergraduate and graduate education program will be based on the performance expectations. They will be articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various levels of qualification and professional cadres:

1. Clinical care
2. Communication
3. Membership of a multidisciplinary health team
4. Ethics and accountability at all levels (clinical, professional, personal and social)
5. Commitment to professional excellence
6. Leadership and mentorship
7. Social accountability and responsibility
8. Scientific attitude and scholarship (only at higher levels-Master's & Ph.D.)
9. Lifelong learning

1. Clinical Care⁴

Using a patient/family-centered approach and best evidence, each student will organize and implement the prescribed preventive, investigative and management plans; and will offer appropriate follow-up services. Program objectives should enable the students to:

- Apply the principles of basic science and evidence-based practice
- Use relevant investigations as needed
- Identify the indications for basic procedures and perform them in an appropriate manner
- Provide care to patients – efficiently and in a cost-effective way – in a range of settings, and maintain foremost the interests of individual patients
- Identify the influence of biological, psychosocial, economic, and spiritual factors on patients' well-being and act in an appropriate manner
- Incorporate strategies for health promotion and disease prevention with their patients

2. Communication^{4,5}

The student will learn how to communicate with patients/clients, care-givers, other health professionals and other members of the community effectively and appropriately. Communication is a fundamental requirement in the provision of health care services. Program objectives should enable the students to:

- Provide sufficient information to ensure that the patient/client can participate as actively as possible and respond appropriately to the information

- Clearly discuss the diagnosis and options with the patient, and negotiate appropriate treatment plans in a sensitive manner that is in the patient's and society's best interests
- Explain the proposed healthcare service – its nature, purpose, possible positive and adverse consequences, its limitations, and reasonable alternatives wherever they exist
- Use effective communication skills to gather data and share information including attentive listening, open-ended inquiry, empathy and clarification to ensure understanding
- Appropriately communicate with, and provide relevant information to, other stakeholders including members of the healthcare team
- Use communication effectively and flexibly in a manner that is appropriate for the reader or listener
- Explore and consider the influence that the patient's ideas, beliefs and expectations have during interactions with them, along with varying factors such as age, ethnicity, culture and socioeconomic background
- Develop efficient techniques for all forms of written and verbal communication including accurate and timely record keeping
- Assess their own communication skills, develop self-awareness and be able to improve their relationships with others
- Possess skills to counsel for lifestyle changes and advocate health promotion

3. **Membership of a multidisciplinary health team**⁶

The student will put a high value on effective communication within the team, including transparency about aims, decisions, uncertainty and mistakes. Team-based health care is the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively to accomplish shared goals within and across settings to achieve coordinated, high quality care. Program objectives will aim at making the students being able to:

- Recognize, clearly articulate, understand and support shared goals in the team that reflect patient and family priorities
- Possess distinct roles within the team; to have clear expectations for each member's functions, responsibilities, and accountabilities, which in turn optimizes the team's efficiency and makes it possible for them to use division of labor advantageously, and accomplish more than the sum of its parts
- Develop mutual trust within the team to create strong norms of reciprocity and greater opportunities for shared achievement
- Communicate effectively so that the team prioritizes and continuously refines its communication channels creating an environment of general and specific understanding
- Recognize measurable processes and outcomes, so that the individual and team can agree on and implement reliable and timely feedback on successes and failures in both the team's functioning and the achievement of their goals. These can then be used to track and improve performance immediately and over time.

4. Ethics and accountability

Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as healthcare service providers. Program objectives should enable the students to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence
- Demonstrate an understanding and application of basic legal concepts to the practice
- Employ professional accountability for the initiation, maintenance and termination of patient-provider relationships
- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

5. Commitment to professional excellence⁷

The student will execute professionalism to reflect in his/her thought and action a range of attributes and characteristics that include technical competence, appearance, image, confidence level, empathy, compassion, understanding, patience, manners, verbal and non-verbal communication, an anti-discriminatory and non-judgmental attitude, and appropriate physical contact to ensure safe, effective and expected delivery of healthcare. Program objectives will aim at making the students being able to:

- Demonstrate distinctive, meritorious and high quality practice that leads to excellence and that depicts commitment to competence, standards, ethical principles and values, within the legal boundaries of practice
- Demonstrate the quality of being answerable for all actions and omissions to all, including service users, peers, employers, standard-setting/regulatory bodies or oneself
- Demonstrate humanity in the course of everyday practice by virtue of having respect (and dignity), compassion, empathy, honour and integrity
- Ensure that self-interest does not influence actions or omissions, and demonstrate regards for service-users and colleagues

6. Leadership and mentorship⁸

The student must take on a leadership role where needed in order to ensure clinical productivity and patient satisfaction. They must be able to respond in an autonomous and confident manner to planned and uncertain situations, and should be able to manage themselves and others effectively. They must create and maximize opportunities for the improvement of the health seeking experience and delivery of healthcare services. Program objectives should enable the students to:

- Act as agents of change and be leaders in quality improvement and service development, so that they contribute and enhance people's wellbeing and their healthcare experience
- Systematically evaluate care; ensure the use of these findings to help improve people's experience and care outcomes, and to shape clinical treatment protocols and services

- Identify priorities and effectively manage time and resources to ensure the maintenance or enhancement of the quality of care
- Recognize and be self-aware of the effect their own values, principles and assumptions may have on their practice. They must take charge of their own personal and professional development and should learn from experience (through supervision, feedback, reflection and evaluation)
- Facilitate themselves and others in the development of their competence, by using a range of professional and personal development skills
- Work independently and in teams. They must be able to take a leadership role to coordinate, delegate and supervise care safely, manage risk and remain accountable for the care given; actively involve and respect others' contributions to integrated person-centered care; yet work in an effective manner across professional and agency boundaries. They must know when and how to communicate with patients and refer them to other professionals and agencies, to respect the choices of service users and others, to promote shared decision-making, to deliver positive outcomes, and to coordinate smooth and effective transition within and between services and agencies.

7. Social Accountability and Responsibility⁹

The students will recognize that allied and healthcare professionals need to be advocates within the health care system, to judiciously manage resources and to acknowledge their social accountability.¹⁰ They have a mandate to serve the community, region and the nation and will hence direct all research and service activities towards addressing their priority health concerns. Program objectives should enable the students to:

- Demonstrate knowledge of the determinants of health at local, regional and national levels and respond to the population needs
- Establish and promote innovative practice patterns by providing evidence-based care and testing new models of practice that will translate the results of research into practice, and thus meet individual and community needs in a more effective manner
- Develop a shared vision of an evolving and sustainable health care system for the future by working in collaboration with and reinforcing partnerships with other stakeholders, including academic health centres, governments, communities and other relevant professional and non-professional organizations
- Advocate for the services and resources needed for optimal patient care

8. Scientific attitude and Scholarship¹⁰

The student will utilize sound scientific and/or scholarly principles during interactions with patients and peers, educational endeavors, research activities and in all other aspects of their professional lives. Program objectives should enable the students to:

- Engage in ongoing self-assessment and structure their continuing professional education to address the specific needs of the population
- Practice evidence-based by applying principles of scientific methods
- Take responsibility for their educational experiences
- Acquire basic skills such as presentation skills, giving feedback, patient education and the design and dissemination of research knowledge, for their application to teaching encounters

9. Lifelong learning¹¹

The student should be committed to continuous improvement in skills and knowledge while harnessing modern tools and technology. Program objectives will aim at making the students being able to:

- Perform objective self-assessments of their knowledge and skills; learn and refine existing skills; and acquire new skills
- Apply newly gained knowledge or skills to patient care
- Enhance their personal and professional growth and learning by constant introspection and utilizing experiences
- Search (including through electronic means), and critically evaluate medical literature to enable its application to patient care
- Develop a research question and be familiar with basic, clinical and translational research in its application to patient care
- Identify and select an appropriate, professionally rewarding and personally fulfilling career pathway



Introduction of new elements in allied and healthcare education

Competency-based curriculum

A significant skill gap has been observed in the professionals offering healthcare services irrespective of the hierarchy and level of responsibility in the healthcare settings. The large variation in the quality of services is due to the diverse methodologies opted for healthcare education and the difference in expectations from a graduate after completion of a course and at work. What one is expected 'to perform' at work is assumed to be learned during the course, however, the course design focuses on what one is expected 'to know'. The competency-based curriculum thus connects the dots between the 'know what' and 'do how'.

The efficiency and effectiveness of any educational programme largely depends on the curriculum design that is being followed. With emerging medical and scientific knowledge, educators have realized that learning is no more limited to memorizing specific lists of facts and data; in fact, by the time the professional aims to practice in the healthcare setting, the acquired knowledge may stand outdated. Thus, competency-based education is the answer; a curricular concept designed to provide the skills that professionals need. A competency-based program is a mix of skills and competencies based on individual or population needs (such as clinical knowledge, patient care, or communications approaches), which is then developed to teach relevant content across a range of courses and settings. While the traditional system of education focuses on objectives, content, teacher-centric approach and summative evaluation; competency-based education has a focus on competencies, outcomes, performance and accomplishments. In such a case, teaching activities are learner-centered, and evaluation is continuous and formative in structure. The competency-based credentials depend on the demonstration of a defined set of competencies which enables a professional to achieve targeted goals. Competency frameworks comprise of a clearly articulated statement of a person's abilities on the completion of the credential, which allows students, employers, and other stakeholders to set their expectations appropriately.^{12 13}

Considering the need of the present and future healthcare delivery system, the curriculum design depicted in this handbook thus will be based on skills and competencies.

Promoting self-directed learning of the professionals

The shift in the focus from traditional to competency-based education has made it pertinent that the learning processes may also be revisited for suitable changes. It is a known fact that learning is no more restricted to the boundaries of a classroom or the lessons taught by a teacher. The new tools and technologies have widened the platform and introduced innovative modes of how students can learn and gain skills and knowledge. One of the innovative approaches is learner-centric and follows the concept of **self-directed learning**.

Self-directed learning, in its broadest meaning, describes a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing learning strategies and evaluating learning outcomes (Knowles, 1975).¹⁴

In self-directed learning, learners themselves take the initiative to use resources rather than simply reacting to transmissions from resources, which helps them learn more in a better way.¹⁵ Lifelong, self-directed learning (SDL) has been identified as an important ability for medical graduates (Harvey, 2003)¹⁶ and so is applicable to other health professionals including AHPs. It has been proven through many studies worldwide that the self-directed method is better than the teacher-centric method of learning. Teacher-directed learning makes learners more dependent and the orientation to learning becomes subject-centred. If a teacher provides the learning material, the student is usually satisfied with the available material, whereas if a student is asked to work on the same assignment, he or she invariably has to explore extensive resources on the subject.¹⁵

Thus the handbook promotes self-directed learning, apart from the usual classroom teaching and opens the platform for students who wish to engage in lifelong learning.

Credit hours vs traditional system

Recently the National Assessment and Accreditation Council (NAAC) and the University Grants Commission (UGC) have highlighted the need for the development of a Choice-Based Credit System (CBCS), at par with global standards and the adoption of an effective grading system to measure a learner's performance.¹⁷ All the major higher education providers across the globe are operating a system of credits. The European Credit Transfer System (ECTS), the 'National Qualifications Framework' in Australia, the Pan-Canadian Protocol on the Transferability of University Credits, the Credit Accumulation and Transfer System (CATS) in the UK as well as the systems operating in the US, Japan, etc. are examples of these. Globally, a need now exists for the use of a fully convertible credit-based system that can be accepted at other universities. It has now become imperative to offer flexible curricular choices and provide learners mobility due to the popularity of initiatives such as 'twinning programmes', 'joint degrees' and 'study abroad' programmes.¹⁸

In order to ensure global acceptability of the graduates, the current curriculum structure is divided into smaller sections with focus on hours of studying which can be converted into credit hours as per the international norms followed by various other countries.

Integrated structure of the curriculum

Vertical integration, in its truest sense, is the interweaving of teaching clinical skills and knowledge into the basic science years and, reinforcing and continuing to teach the applications of basic science concepts during the clinical years. (Many efforts called 'vertical integration' include only the first half of the process).

Horizontal integration is the identification of concepts or skills, especially those that are clinically relevant, that cut across (for example, the basic sciences), and then putting these to use as an integrated focus for presentations, clinical examples, and course materials. e.g. Integration of some of the basic science courses around organ systems, e.g., human anatomy, physiology, pathology; or incorporating ethics, legal issues, finance, political issues, humanities, culture and computer skills into different aspects of a course like the Clinical Continuum.

The aim of an integrated curriculum is to lead students to a level of scientific fluency that is beyond mere fact and concept acquisition, by the use of a common language of medical science, with which they can begin to think creatively about medical problems.¹⁹

This innovative new curriculum has been structured in a way such that it facilitates horizontal and vertical integration between disciplines; and bridges the gaps between both theory & practice, and between hospital-based practice and community practice. The amount of time devoted to basic and laboratory sciences (integrated with their clinical relevance) would be the maximum in the first year, progressively decreasing in the second and third year of the training, making clinical exposure and learning more dominant.¹¹ However it may differ from course to course depending on the professional group.

Introduction of foundation course in the curriculum

The foundation course for allied and healthcare professions is an immersive programme designed to impart the required knowledge, skills and confidence for seamless transition to the second semester of a professional allied and healthcare course. Post admission, the foundation course is designed for a period of 6 months to prepare a student to study the respective allied and healthcare course effectively and to understand the basics of healthcare system. This aims to orient the student to national health systems and the basics of public health, medical ethics, medical terminologies, communication skills, basic life support, computer learning, infection prevention and control, environmental issues and disaster management, as well as orientation to the community with focus on issues such as gender sensitivity, disability, human rights, civil rights etc. Though the flexibility to the course designers have been provided in terms of – modifying the required numbers of hours for each foundation subject and appropriate placement of the subject across various semesters.

Learning methodologies

With a focus on self-directed learning, the curriculum will include a foundation course that focuses on communication, basic clinical skills and professionalism; and will incorporate clinical training from the first year itself. It is recommended that the primary care level should have sufficient clinical exposure integrated with the learning of basic and laboratory sciences. There should also be an emphasis on the introduction of case scenarios for classroom discussion/case-based learning.

Healthcare education and training is the backbone of an efficient healthcare system and India's education infrastructure is yet to gain from the ongoing international technological revolution. The report '*From Paramedics to Allied Health: Landscaping the Journey and way ahead*', indicates that teaching and learning of clinical skills occur at the patient's bedside or other clinical areas such as laboratories, augmented by didactic teaching in classrooms and lecture theatres. In addition to keeping up with the pace of technological advancement, there has been a paradigm shift to outcome-based education with the adoption of effective assessment patterns.

However, the demand for demonstration of competence in institutions where it is currently limited needs to be promoted. The report also mentions some of the allied and healthcare schools in India that have instituted clinical skill centres, laboratories and high-fidelity simulation laboratories to enhance the practice and training for allied and healthcare students and professionals. The report reiterates the fact that simulation is the replication of part or all of a clinical encounter through the use of mannequins, computer-assisted resources and simulated patients. The use of simulators addresses many issues such as suboptimal use of resources and equipment, by adequately training the manpower on newer technologies, limitations for imparting practical training in real-life scenarios, and ineffective skills assessment methods among others.¹ The table mentioned below lists various modes of teaching and learning opportunities that harness advanced tools and technologies.

Table 1 Clinical learning opportunities imparted through the use of advanced techniques^{1,20}

Teaching modality	Learning opportunity examples
Patients	Teach and assess in selected clinical scenarios
	Practice soft skills
	Practice physical examination
	Receive feedback on performance
Mannequins	Perform acquired techniques
	Practice basic procedural skills
	Apply basic science understanding to clinical problem solving
Simulators	Practice teamwork and leadership
	Perform cardiac and pulmonary care skills
	Apply basic science understanding to clinical problem solving
Task under trainers	As specific to Anaesthesia & Operation Theatre Technology

Assessment methods

Traditional assessment of students consists of the yearly system of assessments. In most institutions, assessments consist of internal and external assessments, and a theory examination at the end of the year or semester. This basically assesses knowledge instead of assessing skills or competencies. In competency-based training, the evaluation of the students is based on the performance of the skills as per their competencies. Hence, all the three attributes – knowledge, skills, and attitudes – are assessed as required for the particular competency.

Several new methods and tools are now readily accessible, the use of which requires special training. Some of these are given below:

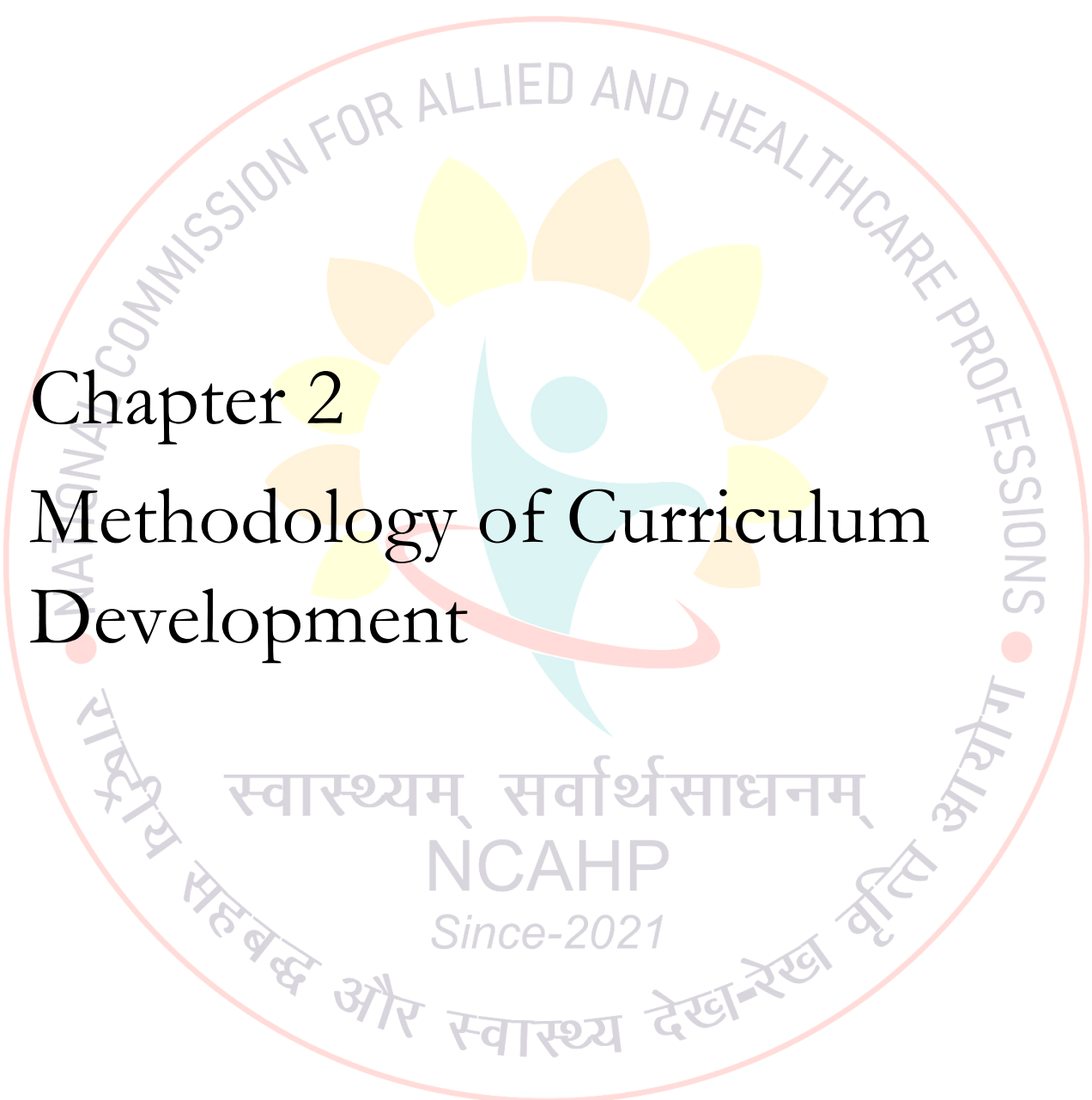
- Objective Structured Clinical Examination(OSCE), Objective Structured Practical Examination (OSPE), Objective Structured Long Examination Record(OSLER)
- Mini Case Evaluation Exercise(CEX)
- Case-based discussion(CBD)

- Direct observation of procedures(DOPs)
- Portfolio
- Multi-source feedback
- Patient satisfaction questionnaire

An objective structured clinical examination (OSCE) is used these days in a number of allied and healthcare courses, e.g. Optometry, Physiotherapy, and Radiography. It tests the performance and competence in communication, clinical examination, and medical procedures/prescriptions. In physiotherapy, orthotics, and occupational therapy, it tests exercise prescription, joint mobilization/manipulation techniques; and in radiography it tests radiographic positioning, radiographic image evaluation, and interpretation of results. The basic essential elements consist of functional analysis of the occupational roles, translation of these roles (“competencies”) into outcomes, and assessment of trainees' progress in these outcomes on the basis of demonstrated performance. Progress is defined solely by the competencies achieved and not the underlying processes or time served in formal educational settings. Most methods use predetermined, agreed assessment criteria (such as observation check-lists or rating scales for scoring) to emphasize on frequent assessment of learning outcomes. Hence, it is imperative for teachers to be aware of these developments and they should suitably adopt them in the allied and healthcare education system.²¹







Chapter 2

Methodology of Curriculum Development

Chapter 2: Methodology of curriculum development

With the release of the report 'From Paramedics to Allied Health: Landscaping the journey and the way ahead', the Ministry of Health and Family Welfare prioritized the key recommendations and concerns raised by various allied and healthcare professionals groups and experts as indicated in the report. One of the major recommendations in the report was the need for standardization of curriculum and pedagogic requirements for the major allied and healthcare professional courses.

The MoHFW had identified 12 priority professional streams in the phase-I for the purpose of standardization. The expertise of over 50 leading public and private allied and healthcare educational institutions for 12 different disciplines has been sought as part of this exercise. Additionally, international experts from Canada, Sweden, USA and UK were also being roped in, to arrive at a comprehensive and globally acceptable set of educational standards based on a skills and competencies approach. The opinions were sought from experts for all the courses, though curricula for the following two professions were not redesigned as they fall under the ambit of regulatory body- Rehabilitation Council of India governed by Ministry of Social Justice and Empowerment –

- Audiology and Speech Pathology
- Orthotics and Prosthetics

The National Skills Development Agency has also developed the National Skills Qualification Framework (NSQF). Under the aegis of the NSDA, the Healthcare Sector Skill Council (HSSC) has undertaken a similar process for a few entry level allied and healthcare courses (Certificate and Diploma level). The focus of Ministry of Health and Family Welfare is thus to preempt duplication of efforts and arrive at a comprehensive set of minimum standards for the allied and healthcare professions but for higher level professional qualifications. This would ensure that the key considerations and obligations of both the public and the private sector are adequately addressed.

In view of the above, the Ministry of Health and Family Welfare instituted 12 National Curricula Redesign Taskforce groups comprising of academicians and professionals from the best institutes and colleges across the country. These people served as subject experts and redesigned the curricula based on a standardized framework developed by the NIAHS TSU (National Initiative for Allied Health Sciences-Technical Support Unit), which is the technical arm supporting this project. The final curriculum has been reviewed and approved by the National Curricula Review Committee (NCRC), (constituted by the MoHFW), that consists of experts with versatile and immense experience in their respective streams, to assess the applicability of the curricula drafted in view of the healthcare system as a whole.

Steps undertaken in the curricula review process –

1. Curricula were sought from various States and institutions across the country in response to which the NIAHS TSU reviewed–
 - a. 118 curricula of allied and healthcare courses (different levels and different professions) from 10 states across the country;
 - b. 133 curricula of various allied and healthcare courses collected during phase-I of the NIAHS project.
2. Literature review – a comprehensive literature review was undertaken resulting in a detailed curriculum of the allied and healthcare courses, which included competency and skills-based models followed nationally as well as internationally, methodologies of curriculum development, assessment protocols, and many such aspects of curriculum development. The literature review helped the TSU to develop a reference document that comprised of a standard framework for a competency-based curriculum to be followed for the curricula review and redesign. A detailed mapping of all the resources was undertaken and shared with the task group experts via email.
3. Constitution of the National Curricula Redesign Taskforces for various professional groups – Specific taskforces were then instituted comprising of technical as well as subject experts who were engaged in the process of redesigning the curriculum.
4. Constitution of the National Curricula Review Committee (NCRC) – The NCRC comprising of experts with versatile and immense experiences of their respective domain, was then constituted for final review and approval on the curriculum drafted by the taskforce and NIAHS TSU.
5. National Curricula Redesign Taskforce Consultations– a series of consultations were conducted with subject experts including both regional and national task group experts to develop a ‘skill and competency’ framework for education and career pathways. The consultations were facilitated by the NIAHS TSU members and were led by the chairperson of the group. Post this, the draft version and recommendations were compiled by the TSU members and sent to the experts for final review and consent.
6. Local consultations – These were also conducted in different hospitals and other healthcare settings to get suggestions, feedbacks and ideas from the subject experts for their respective curricula.
7. Response draft – Comments and suggestions were received on the draft and a response draft curriculum was prepared, which was then re-circulated for final consent and validation by the task group experts.
8. Submission and approval of draft curriculum – The final draft of the curriculum handbook was then submitted by the taskforce chairman to the National Curricula Review Committee for approval and final sign-off.
9. Public opinion – The handbook was uploaded to seek public opinion from national and international experts, students, faculty, and practitioners of the respective professional groups.

10. Final approval by the NCRC- The comments and suggestions by the public were then reviewed and considered for any possible modification by the taskforce group. The final approval and sign off for the overall structure was then sought from NCRC.
11. Dissemination- The final handbook (guidelines) is disseminated by the Ministry of Health and Family Welfare for further adoption and incorporation by institutes/universities as applicable to ensure standardization.

Review of Model Curricula in 2023-24.

National Taskforce was reconstituted by the Interim Commission/National Commission for Allied and Healthcare Professions to review the existing curricula for all major allied health professions. Reconstituted taskforce was provided the draft curricula prepared by the previous taskforce in the year 2015-16 and approved by NCRC to review and to recommend the necessary changes required into this under the guidance and supervision of Committee for Curriculum Standardization and other Standards under National/Interim Commission for Allied and Healthcare Professions, Ministry of Health & Family Welfare, Government of India. Taskforce was provided the guiding principles and parameters while reviewing the curricula.

Taskforce reviewed the draft curricula and find the Bachelor's degree program curriculum substandard and outdated and decided to prepare a fresh curriculum for the bachelor's degree program retaining the some course content from the previous curriculum and designing the curriculum afresh keeping in view the technological advancements and progress happened in this rapidly evolving field of allied health sciences. Similarly taskforce designed the Master's course curriculum as the master's course curriculum was not prepared by the previous taskforce and it was not part of the draft Curricula Handbook for Operation Theatre Technology.

Following process was followed by the Taskforce in the review of draft curriculum for Anaesthesia & Operation Theatre Technology (AOTT):

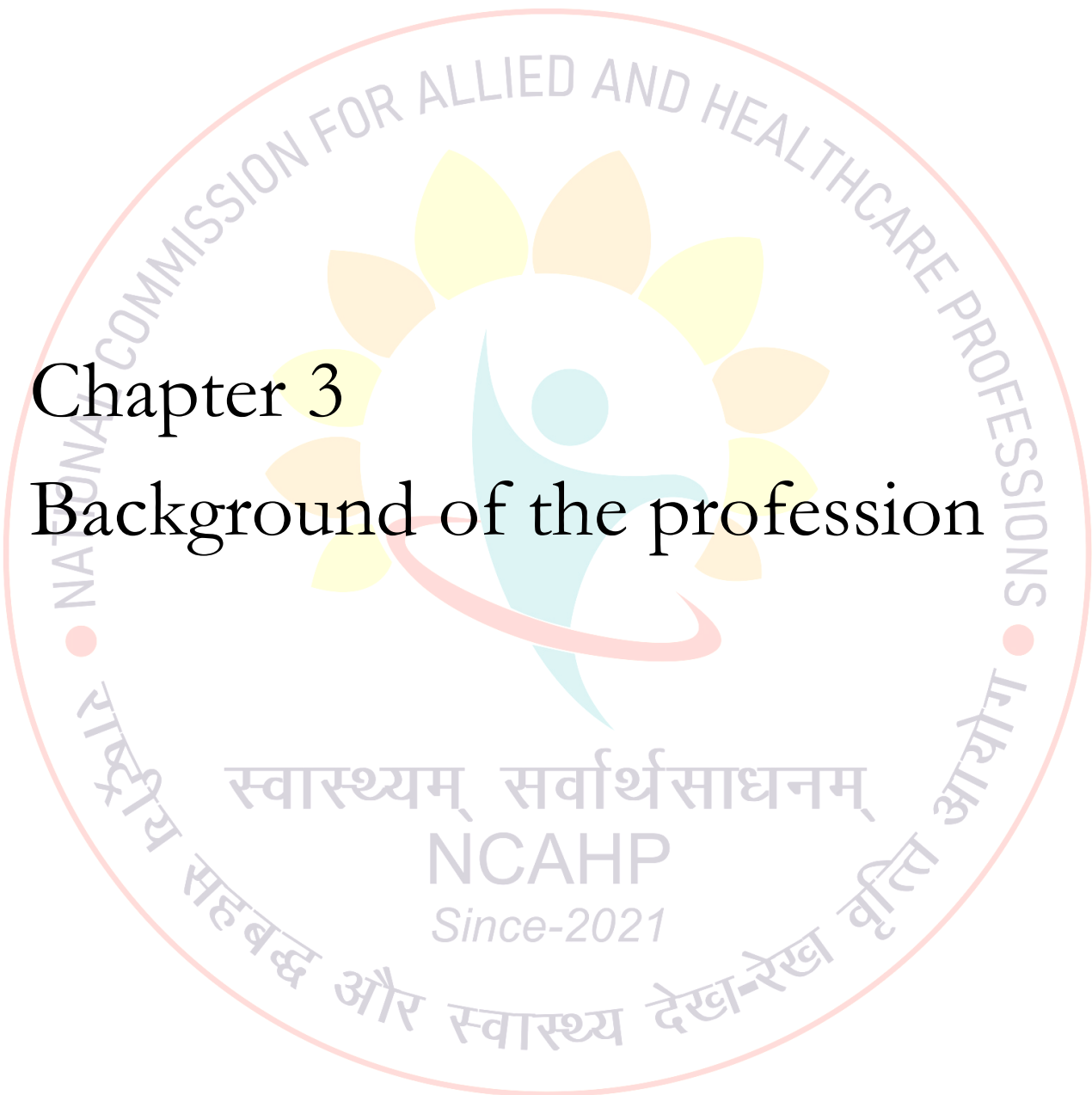
1. Curricula were collected from all the major Institutions/Universities conducting the undergraduate and postgraduate courses in Anaesthesia & Operation Theatre Technology with varied nomenclature and course duration. Taskforce studied all the curricula taught in major Government as well private sector Institutions/Universities in order to prepare a competency and skills based curricula which meets the future expectations and prepare the well trained professionals who have in depth knowledge and who can work in the challenging environment of modern healthcare delivery system.
2. Taskforce decided to change the nomenclature of the undergraduate as well as postgraduate program due to following reasons:
 - a) Clarity of Focus: The proposed name, "Baccalaureate or Bachelors in Anaesthesia & Operation Theatre Technology (B.AOTT)," clearly communicates the dual specialization of the program, providing prospective students and stakeholders with a more accurate representation of the curriculum.
 - b) Alignment with Industry Trends: The healthcare industry is witnessing an increasing demand for professionals with expertise in both Anesthesia and Operation Theatre Technology. Aligning the program's nomenclature with this industry trend will enhance its marketability and relevance.

- c) Enhanced Employability: The revised nomenclature may attract a broader spectrum of students who are specifically interested in pursuing a career that involves both Operation Theatre procedures and Anaesthesia Technology. The Taskforce has recommended the program nomenclature as “Baccalaureate in Anaesthesia and Operation Theatre Technology” due to its enhanced employability and acceptability at National level..
3. Literature review – a comprehensive literature review was undertaken by the Taskforce resulting in development of a detailed curriculum of “Anaesthesia & Operation Theatre Technology” courses, which included competency and skills-based models followed nationally as well as internationally, methodologies of curriculum development, assessment protocols, and many such aspects of curriculum development.
 4. National Curricula Review Taskforce Consultations– a series of consultations were conducted with subject experts including both regional and national task group experts to develop a ‘skill and competency’ framework for education and career pathways. The consultations were facilitated and led by the Chairperson of the Committee for Curriculum Standardization and other Standards and local consultations in taskforce were led by the chairperson of the taskforce group. Post this, the draft version and recommendations were compiled by the Taskforce Team Leader and sent to all the experts for final review and consent.
 5. Response draft – Comments and suggestions were received on the draft curricula from all the experts and a response draft curriculum was prepared, which was then re-circulated for final consent and validation by the task group experts.
 6. Submission and approval of draft curriculum – The final draft of the curriculum handbook was then submitted by the taskforce lead expert to the Committee for Curriculum Standardization and other Standards for review and approval of the Committee.
 7. Public opinion – The draft curricula handbook was uploaded on the Ministry of Health and Family Welfare website to seek public opinion from national and international experts, students, faculty, practitioners and other various stake holders of Anaesthesia & Operation Theatre Technology.
 8. Modifications after the public opinion- The comments and suggestions received from stake holders were then reviewed and considered for any possible modification by the taskforce group in a meeting held under the chairmanship of Hon’ble Chairperson of National Commission of Allied and Healthcare Professions. The necessary modifications agreed upon in the meeting were incorporated into the curricula by the Task force.
 9. Final Approval and Dissemination: The final draft of Curricula was submitted to the NCAHP through the Chairperson of the Committee for Curriculum Standardization and other Standards constituted under NCAHP. The curricula were finally reviewed by this empowered Committee for Curriculum Standardization and other Standards for final approval and dissemination.



Chapter 3

Background of the profession



Chapter 3: Background of the profession

Statement of Philosophy– Why this profession holds so much importance

A latest study by the Harvard School of Public Health has found that while the South-East Asia region has just 2.6 OTs per 1 lakh population, the number is as low as 1.3 OT per 1 lakh population in India and Pakistan. Whereas, developed regions like Eastern Europe have the highest number of OTs per 1 lakh population - 25.1, followed by Asia Pacific (high income countries) 24.3, Central Europe 15.7, Western Europe 14.7, North America and Australasia 14.3, Central Asia 11.7 and the Caribbean 10.4 OTs). So we may interpret that there is an enormous scope and need for the profession not only in India as well as in other developing countries but at the same time along with skilled manpower we need adequate manpower.

Moreover, a variety of electrical and electronic equipment are in use in modern operation theatres for monitoring anesthesia & surgical procedures, the success of the procedures and safety of patients depend largely on the reliability, smooth and trouble free performance of these equipment's and ability of skilled manpower to operate the same. Thus, there is increased need for qualified and trained professionals in the system. This course is aimed at satisfying this need.

About Anaesthesia & Operation Theatre Technology

An Anaesthesia & operation theatre (OT) technologist forms an intrinsic part of any hospital. To become a trained professional one must undertake Anaesthesia & operation theatre technology course. An AOT professional is the one, who facilitates the surgical procedures, planned and emergency both, by preparing in advance the equipment that are necessary for any surgical procedures. He/she also looks after all the work and management of the operation theatre which includes managing the patients in & out of operation theatre, looking after all the surgical equipment, arrangement of operation theatre table, dressing table, anesthesia table as well as management of the staff. As the surgical branch has various specialties including General Surgery, OBG, Cardiac, Ortho and genito-urinary, the OT technologist needs to know about these various specialties.

Scope of practice

- Setup, check, and maintain anesthesia machine, monitors life support equipment like airway equipment, ventilator, emergency equipment, defibrillator, anesthetic and resuscitation drugs.
- Orders, Maintains and keep records of all anesthesia equipment and drug.
- Assist Anesthetist in patient procedures like setting up of invasive lines, airway management, setting up of monitors and administer anesthesia to patient
- Assists during emergency situations by assisting in basic and advanced life support, critical events
- Prepares and maintains operation table, light, electric cautery, tourniquets etc.
- Management of central sterile services department. Packing of equipment and linen. Sterilization procedures like autoclaving, plasma sterilization and disinfection procedures as per guidelines, checking, storage and dispatch.
- Management in Intensive Care unit and emergency department of equipment like ventilators, monitors, infusion pumps, defibrillators etc.

- h. Assist disaster team in disaster situations and national emergencies on field and safe transport in ambulance.
- i. Assist anesthesia and surgical team in all kinds of surgical disciplines.
- j. Assist anesthetist during anesthesia procedures outside operation theatres like CT and MRI suits, Cardiac catheterization laboratory, pain relief procedures etc.

Recognition of Title and qualification

Within the multidisciplinary team, the professional responsible for the facilitation and preparation of the surgical procedures is the Anaesthesia & Operation theatre technologist.

The recommended title thus stands as the Anaesthesia & Operation Theatre Technologist with the acronym - AOTT for this group of professionals.

It is a known fact that with the career advancement, the nomenclature will also vary and will also depend on the sector and profile of the professional. Considering the 10 NSQF levels designed by the NSDA, the following level progression table has been proposed by the taskforce to map the nomenclature, career pathways and progression in different sectors of professional practice for Anaesthesia & Operation Theatre Technologist. **The proposed progression is for further discussion and deliberation, the implementation time of the same may vary depending on the current system and regulations in place.**

The table 2 below indicates the various channels of career progression in three distinct sectors such as clinical setting, academic and industry (management/sales or technical) route. It is envisaged that the AOTT will have two entry pathways – students with diploma or baccalaureate. The level of responsibility will increase as the career progresses and will start with NSQF level four (4) for diploma holders and NSQF level five (5) for baccalaureate degree holders. The table also indicates the corresponding level of qualification with experience required by the professional to fulfill the requirements of each level. Considering the degree of patient dealing in anaesthesia & operation theatre technology and such other professions, government aims to phase out the Diploma and PG Diploma level courses and promote Bachelors' and Masters' degree courses. In the academic front, as per UGC guidelines, to work at the position of a Lecturer/Assistant Professor the candidate must attain master degree. At present there are limited master degree seats in Anaesthesia & Operation Theatre Technology in India, and thus it has been decided that Universities will be promoted to start master degree courses. The table also indicates that career progression is up to the level 10 of NSQF, however it needs to be stated that the ultimate signatory on patient documentation stands with the surgeon on role, the chief technical officer of the OT unit (clinical route) will be the ultimate authority for the management responsibilities, the final authority for the clinical decisions will be with the doctor.

Table 2: Nomenclature based on career progression for Anaesthesia & Operation Theatre Technologist (Proposed)

Nomenclature in various sectors			Qualification and experience
Clinical	Academic	Industry	
Junior Anaesthesia & Operation Theatre Technologist		Technical associate	• Diploma AOTT with 0 - 5 years post Diploma AOTT experience
Anaesthesia & Operation Theatre Technologist	Demonstrator	Anaesthesia & Operation Theatre Technologist	• B. AOTT • Diploma AOTT with 6-10 years post AOTT)
Senior Anaesthesia & Operation Theatre Technologist	Tutor/ Lecturer (Post Graduate)	Senior Anaesthesia & Operation Theatre Technologist	• B. AOTT with 4 years' experience at Level-5. • M. AOTT (for academic role) • Diploma AOTT 11-15 years' experience. (only for Industry pathway)
Technical Officer (AOTT)	Assistant Professor	Chief Anaesthesia & OT Technologist	• B. AOTT with 4 years' experience at Level -6 • M. AOTT with 4 years post M.AOTT experience. for academic role • Ph.D. AOTT for Academic role.
Senior Technical Officer (AOTT)	Associate Professor	Deputy Manager for Anaesthesia & OT Technology	• B. AOTT with 4 years' experience at Level-7 • M. AOTT with 8 years post M.AOTT experience. • Ph.D. AOTT with 4 years post PhD experience for Academic pathway
Chief Technical Officer (AOTT)	Additional Professor	Additional Director for Anaesthesia & OT Technology	• B. AOTT with M.AOTT with 4 years' experience at Level-8 • M. AOTT with 12 years post M.AOTT experience. • Ph.D. AOTT with 8 years post PhD experience for Academic pathway
Chief Manager (AOTT)/ AOTT Head/	Professor/ Principal	Director for Anaesthesia & OT Technology	• B. AOTT with M.AOTT with 4 years (only clinical/industry role) experience at Level-9 • Master's in AOTT with 15 years post M.AOTT experience. • Ph.D. AOTT with 12 years post PhD experience.

Career progression

Abbreviations

* B. AOTT – Baccalaureate in Anaesthesia & Operation Theatre Technology.

* M. AOTT – Master's in Anaesthesia & Operation Theatre Technology.

*AOTT – Anaesthesia & Operation Theatre Technology.

IMPORTANT NOTES:

1. Diploma AOTT, Bachelor in AOTT and Master's AOTT completed before implementation of this scheme shall be considered at par with the current scheme of Diploma AOTT, Bachelors in AOTT and Masters in AOTT respectively, irrespective of their course duration for concerned level.
2. Existing in-service Anaesthesia & Operation Theatre Technologists should be considered at par in the present scheme at their respective levels.
3. *Diploma should be phased out in next 5 years and the minimum required qualification should be Bachelor in AOTT with 4 years duration course (3 years + 1 year internship).

Definition of Anaesthesia & Operation Theatre Technologist

Anaesthesia & Operation theatre Technologist is a member of a multidisciplinary team in operation theatres who prepare and maintain an operating theatre. Assists anaesthetist and surgical team during peri-operative period and provides support to patients in the recovery room.

Education of the Anaesthesia & operation theatre technologist

When developing any education programme it is necessary that programme planning should be outcome-based, meeting local and national manpower requirements, personal satisfaction and career potential for the professionals with supporting pathway in the development of the profession. One of the major changes is the shift from a focus based on traditional theoretical knowledge and skills to competency based education and training. Optimal education/training requires that the student is able to integrate knowledge, skills and attitude in order to be able to perform a professional act adequately in a given situation.

Thus, the following curriculum aims to focus on skills and competencies based approach for learning and is designed accordingly. The curriculum is prescriptive and is designed with an aim to standardize the content across the nation.

Entry requirements

It is recommended that the students entering the AOTT programme should have completed the recognized secondary school studies as the qualification, stipulated for AOTT course (diploma/degree) is **10+2 or equivalent examination with science subjects (Physics, Chemistry and Biology)** from a recognized university or board which would provide the foundation for and prepare them for higher education studies with minimum 50% aggregate marks at HSC for open category and minimum 45% aggregate marks for reserve category.

Course Duration

It is recommended that any programme developed from this curriculum should have a minimum of the following duration to qualify as an entry level professional in AOTT -

- Diploma in Anaesthesia & Operation Theatre Technology (D. AOTT)- 2.5 year programme (including 6 months of clinical training/internship)- Diploma level
- Baccalaureate in Anaesthesia & Operation Theatre Technology (B. AOTT)- 4 year programme (including 1 year of clinical training /internship)- Bachelor's degree level
- Masters in Anesthesia & Operation Theatre Technology (M. AOTT)- 2-year programme – Master's degree programme.
- Ph.D. in Anaesthesia & Operation Theatre Technology.

IMPORTANT NOTE:

1. Diploma AOTT, Bachelor in AOTT and Master's AOTT completed before implementation of this scheme shall be considered at par with this scheme of Diploma AOTT, Bachelors in AOTT and Masters in AOTT respectively, irrespective of their course nomenclature, duration etc. for admission to higher program.
2. *Diploma should be phased out in the future (preferably in next 5 years) and the minimum required qualification should be Bachelor in AOTT with 4 years duration course (3 years + 1 year internship).

The emphasis initially should be on the academic content establishing a strong scientific basis and in the latter year on the application of theory to clinical/reflective practice. In Bachelor degree programme minimum one year should be devoted to clinical practice and this should be on a continuum of rotation from theory to practice over the programme. The aim of the 4 year degree programme is to enable the development of the AOTT as a key member of the multidisciplinary team and to enable him/her to execute his/her role with ensuring quality.

With the change in the disease dynamics and multifold increase in the, it is imperative that a well-structured programme of postgraduate education is also encouraged so as to enhance research capacity within the country to widen the scope of clinical practice for the profession. Thus, **a master's degree programme is recommended with minimum of two years of education in specialized field.** The post graduate students can contribute significantly in research and academics. Presently, there are limited master degree courses in the country and institutes and universities should be encouraged to start master and doctorate courses.

Teaching Faculty and Infrastructure

The importance of providing an adequate learning environment for the students cannot be over emphasized. Both the physical infrastructure and the teaching staff must be adequate.

Teaching areas should facilitate different teaching methods. Where students share didactic lectures with other disciplines (e.g. nurses) large lecture theatres may be appropriate, but smaller teaching areas should also be provided for tutorial and problem/case-based learning approaches. In all venues where students are placed the health and safety standards must be adhered to.

The recommended teachers to student ratio in the UG level should be -1:25.

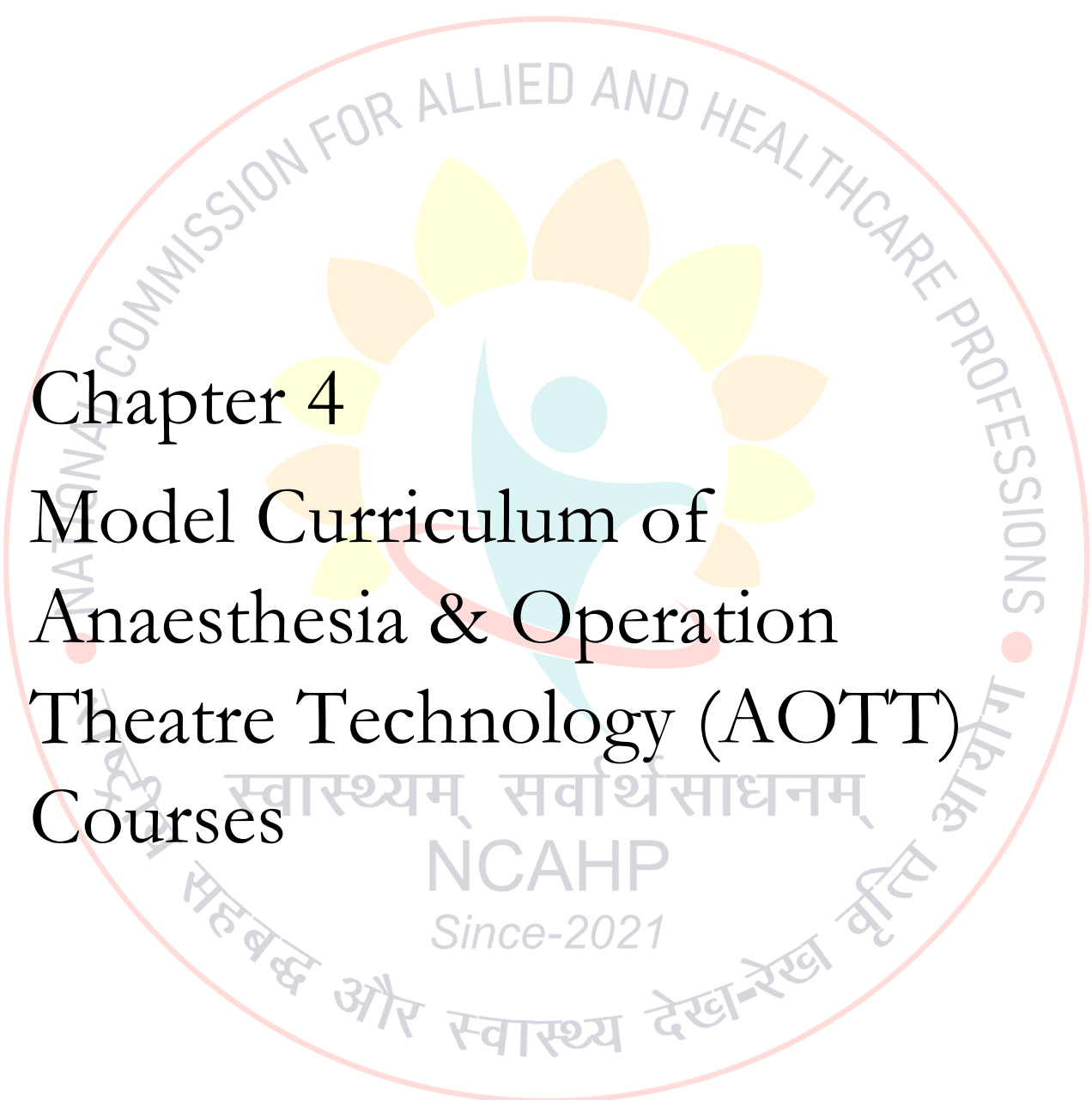
Job availability

As per ILO documentation, employers worldwide are looking for job applicants who not only have technical skills that can be applied in the workplace, but who also can communicate effectively, including with customers; can work in teams, with good interpersonal skills; can solve problems; have good ICT skills; are willing and able to learn; and are flexible in their approach to work.²² After completion of the courses mentioned in following chapters, the individual will find a challenging career in a hospital, nursing homes, trauma / emergency centers, Intensive Care units, CSSD etc. Graduates are eligible for employment overseas where their qualifications, training and experience are highly regarded. With further experience, graduates may be employed by medical equipment manufacturers and development specialists.

Graduates have good employment prospects, and will enter a field in which the demand for professionals has increased in recent years and will keep on increasing due to changing environment and conditions.







Chapter 4

Model Curriculum of Anaesthesia & Operation Theatre Technology (AOTT) Courses

Chapter 4: Model Curriculum

Background

The need for accuracy in preparation and delivery is a critical component of modern technology driven healthcare and requires knowledge and understanding of the basic sciences as well as the interaction between the technology used in operation theatres and the site within the body that needs the surgical intervention. In an era of greater complexity of technology and techniques, the role of the Anaesthesia & operation theatre technologist (AOTT) and his/her level of responsibility is continually evolving and expanding. Education programmes should provide the AOTT with the scientific theoretical foundation of the profession and enable them, as practitioners, to be able to synthesize, evaluate and apply their knowledge in a clinical setting.

The aims of the recommended curriculum are to produce AOTTs who are

- Technically and clinically competent;
- Aware of safety issues and the importance of quality assurance;
- Understand the theoretical basis for evidence based practice;
- Effective members of the multidisciplinary team;
- Prepared to participate in or initiate research into practice;
- Can work according to registration requirements on the respective continents.

All aspects of anaesthesia & operation theatre technology have been considered in the development of this curriculum together with the identification of the roles expected for different levels based on their qualification and experience. The need for connecting the dots between the education and employment practices has been the road map for devising this curriculum.

The National Curriculum Taskforce on Anaesthesia & Operation theatre technology has successfully designed the career and qualification map indicating the growth opportunities for a professional in the career pathway based on the level as indicated in the National Skills Qualification Framework (NSQF). The career pathway indicates **NSQF level 4 corresponding Pay level - 7 as per 7th CPC as the entry level** after the completion of a minimum 2.5 years of diploma level programme in Anaesthesia & operation theatre technology (Diploma in Anaesthesia & Operation Theatre Technology) as well as **NSQF level 5 (Pay level - 8 as per 7th CPC) as the entry level** after completion of a minimum 4 years of Baccalaureate level programme on Anaesthesia & operation theatre technology (Bachelor in Anaesthesia & Operation Theatre Technology). The component of the programmes starting from diploma and above has been detailed out in the coming chapters.

Foundation course has also been designed to bring all the students at the same level of understanding with respect to basic healthcare related norms before the start of a career in a healthcare professional course. The foundation course is mandatory for all the allied and healthcare professional courses and for both entry level courses – diploma as well as degree. If a diploma holder has completed the foundation course and is willing to pursue the degree course, the candidate will directly get entry for next semester, however a pre- qualifier skill test will have to be satisfactorily completed, if not, then the candidate will have to undergo the first semester of foundation course again.





4.1 Diploma in Anaesthesia & Operation Theatre Technology (D. AOTT)

Diploma in Anaesthesia & Operation Technology

Introduction

The Anaesthesia & operation theatre (AOT) technologist is an integral person in the dynamic operating theatre team. The success of the procedures and safety of patients depends largely on the reliability of the AOT technologist. This course aims in providing the technical and interpersonal skills required to work under the supervision of anesthetists and surgical personnel.

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

1. Be able to understand the basics of -Ethics, Discipline, Layout, and Equipment in OT.
2. Be able to understand the basics of Anesthesia related modalities and procedures.
3. Be able to position the patients in different operating procedures and for anesthesia procedures in operation theatres and intensive care units.
4. Have knowledge of basic principles of IV line, fluids, transfusion and C.P.R.
5. Demonstrate knowledge and skills related to routine care and endoscopes, Anesthetic Machines, Monitors etc.
6. Demonstrate knowledge and skilled related to Sterilization of OT Room, Instruments, Endoscopes, CSSD procedures, work flow and management.
7. Demonstrate knowledge and skilled related to Disposal of waste.
8. Be able to keep records and stock maintenance of Anaesthesia drugs including narcotics and emergency drugs.
9. Be able to collect data and compute information.

Expectation from the future diploma holders:

1. The coursework is designed to train students to work in conjunction within the OT team including surgeon, anesthesiologist, nurses and other members.
2. The student will be skilled in surgical preparation, supporting the team in peri operative procedure and also ensure patient support.
3. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent trauma centres.
4. Diploma holder is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology; the professional should opt for continuous professional education credits offered by national and international institutes.

Eligibility for admission

Selection procedure

1. Candidate should have passed 10 + 2 with Science.
2. Minimum percentage of marks: 50% aggregate in PCB/ (Physics, Chemistry & Biology)
3. Reservation for SC/ST/OBC categories: As per Govt. of India rules

Provision of Lateral Entry:

Lateral entry at Diploma level will not be there, as this is the basic entry level for the professionals.

Duration of the course

Duration of the course is 2.5 years or 5 semesters (inclusive of six months of internship) with 1020 hours of Theory & 1020 hours of Practical Classes and another 720 hours dedicated for internship.

Total number of hours – 2760 for the total course

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 -

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:

1. Lecture Materials:
 - Comprehensive lecture notes.
 - Presentations and slides.
 - Handouts and reading materials.
2. Demonstration Models:
 - Anatomical models /simulators for demonstrating surgical techniques.
 - Simulators for practicing instrument handling and airway management.
3. Surgical Instruments:
 - Real surgical instruments (including laparoscopic, arthroscopic and Robotic instruments) for hands-on practice.
 - Simulated instruments for familiarization.

4. Audiovisual Aids:

- Educational videos demonstrating surgical procedures.
- Interactive simulations or virtual reality tools.

5. Anaesthesia Equipment:

- Anaesthesia machines.
- Monitors for vital signs and anaesthesia administration.
- Airway management devices.
- Intravenous equipment.

6. Sterile Technique Supplies:

- Sterile drapes.
- Surgical gowns and gloves.
- Sterile instruments and supplies.

7. Monitoring Equipment:

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

8. Simulation Training:

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

9. Clinical Observations:

- Opportunities to observe actual surgical procedures.
- Assistance in real-world clinical settings.

10. Case Studies and Scenarios:

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

11. Assessment Tools:

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

Additionally, it is important to have a well-equipped simulation lab with appropriate infrastructure, access to clinical facilities for practical training, and safety protocols in place to ensure a conducive learning environment. Regular debriefing sessions, reflective discussions, and opportunities for students to ask questions and clarify doubts are also valuable components of the learning process.

The standalone Institutions who wish to conduct these allied health courses in Anaesthesia & Operation Theatre Technology will sign a MOU with the Hospitals/Healthcare facilities for providing practical training to the students of Anaesthesia & Operation Theatre Technology. The Hospitals/Healthcare facilities will impart practical training to the students by posting them in Operation Theatres and ICUs and other patient care areas which are essential for these students. The Number of students admitted in the baccalaureate course by every hospital/healthcare institution will not exceed by the 10% of the total bed strength of that hospital/healthcare facility with adequate numbers of Operation Theatres and ICU beds.

Teaching faculty and infrastructure

Institute should mandatorily be associated with the state medical colleges whereby they can make use of the available patient load and medical infrastructure as a part of their training curriculum (May be through MOU).

- Standalone institutions must have a MoU with either a medical college or hospital or healthcare facility as per the guidelines (desired number of Operation Theatres/ICU beds/HDU beds) defined in the curriculum to ensure practical exposure to the students.
- MoU to also define the clinical supervision of the students –institutional staff or clinical preceptors can be considered.

For the institutes to be capable of providing high quality training to the students and exposure to all the related specialties, it should have the following:

- Operating Theatres.
- Intensive Care Units. (Surgical and Medical)
- High Dependency Units (HDUs)
- Simulation Labs.
- Central Sterile Supply Department.
- Post-Operative Care Unit (PACU)

The teaching faculty (with annual intake of up to 30 students) for the BAOTT course should have a minimum of Master's in the MAOTT or MAOTT with PhD in relevant subject.

- 1 Professor
- 2 Associate Professors
- 4 Asst. Professors.
- 8 Demonstrators/Tutors.

Method of teaching and learning-

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

- 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

Infrastructure requirements:

- Minimum 4 classrooms with minimum seating capacity of 30 students
- Faculty rooms, Common rooms for students
- Auditorium/Conference room with minimum seating capacity of 150 students.
- Library
- Student canteen/cafeteria
- Office rooms for staff

Assessment and Evaluation

Scheme of Evaluation

The academic performance is assessed on the basis of both Continuous Internal Evaluation (CIE) assessment and End Semester Examination (ESE) in each semester.

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

Continuous Internal Evaluation (CIE)

- 30% of the total marks is allotted for CIE in each course.
- 50% of CIE shall be based on the average of marks obtained in two notified formative written tests. Absence without prior permission for a formative test shall result in scoring of the test as zero.
- The remaining 50% of CIE will be based on internal assessments in the form of evaluation seminars, journal club presentations, case presentations, completion of assignments etc. which will be specified in the individual course curricula.
- CIE will be conducted for theory and practical for each course wherever applicable.
- A Candidate must secure at least 40% of total marks fixed for CIE in the particular subject in order to be eligible to appear for the End Semester Examination (ESE) for that subject.

End semester examination (ESE)

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

Criteria for pass:

A Candidate must score 50% separately in theory and practical wherever applicable to be declared as pass. In case of fail, subsequently a candidate has to appear for both theory and practical examination of the university in that particular course.

Attendance and appearance for Exam:

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

Stipend: All students shall be paid a stipend amount of Rupees 6000/- per month during first 4 semesters and stipend amount of Rupees 15000/- per month during internship.

Model Curriculum Outline

First Semester– Foundation Course

Teaching resources (tutors) should be made available at every institute for basic subjects such as – Biology and English for students who wish to undertake the extra classes for the same.

First Semester– Foundation Course

Sl. No.	Course Titles	Hours per week				Marks			CR
		T	P	CLP	Total	Internal	External	Total	
DAOTT-001	Introduction to Healthcare Delivery System in India	2	0	0	2	15	35	50	2
DAOTT-002	Medical Terminology and Record keeping	2	0	0	2	15	35	50	2
DAOTT-003	Anatomy	4	2	0	6	30	70	100	5
DAOTT-004	Physiology	4	2	0	6	30	70	100	5
DAOTT-005	Health Care Quality & Patient Safety	3	2	8	13	30	70	100	6
DAOTT-006	Medical Law and Ethics, Professionalism & Values, Principles of Management	3	2	0	5	30	70	100	4
Total		18	8	8	34	150	350	500	24
Total Hours in semester		270	120	120	510				

Second Semester

Sl. No.	Course Titles	Hours per week				Marks			CR
		T	P	CLP	Total	Internal	External	Total	
DAOTT-007	Basic computers and information Science, Communication and soft skills.	3	2	0	5	30	70	100	4
DAOTT-008	Lab Sciences	3	2	3	8	30	70	100	5
DAOTT-009	Basic Concepts in Pharmacology	4	0	3	7	50	70	100	5
DAOTT-010	Basics of Biomedical sciences in surgery and Anaesthesia	3	3		6	30	70	100	5
DAOTT-011	Anaesthesia Equipment's & Devices	3	2	3	8	30	70	100	5
Total		16	9	9	34	150	350	500	24
Total Hours in semester		240	135	135	510				

Third Semester

Sl. No.	Course Titles	Hours per week				Marks			CR
		T	P	CLP	Total	Internal	External	Total	
DAOTT-012	Basic techniques of Anaesthesia	4	2	3	9	30	70	100	6
DAOTT-013	Basics of Surgical procedures	4	2	3	9	30	70	100	6
DAOTT-014	CSSD & Manifold Area.	3	2	0	5	50	70	100	4
DAOTT-015	Basic Intensive Care	3	2	3	8	30	70	100	5
DAOTT-016	Disaster Management & Environmental Sciences	3	0	0	3	30	70	100	3
	Total	17	8	9	34	150	350	500	24
Total Hours in semester		255	120	135	510				

Fourth Semester

Sl. No.	Course Titles	Hours per week				Marks			CR
		T	P	CLP	Total	Internal	External	Total	
DAOTT-017	Advanced Anaesthesia Techniques	4	2	3	9	30	70	100	6
DAOTT-018	Advanced Surgical procedures	4	2	3	9	30	70	100	6
DAOTT-019	Specialized Anaesthesia & Surgery	3	2	3	8	50	70	100	5
DAOTT-020	Recent Advancements in Anaesthesia & Surgery	3	2	0	5	30	70	100	4
DAOTT-021	Research Methodology & Biostatistics	3	0	0	3	30	70	100	3
	Total	17	8	9	34	150	350	500	24
Total Hours in semester		255	120	135	510				

Fifth Semester

Sl. No.	Course Titles	Hours		
		Theory	Practical	Total
DAOTT-022	DAOTT Internship		720	720

DAOTT-001 – Introduction to Healthcare Delivery System in India**(30 Hours)****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 Outcome

The course outcomes include describing the primary, secondary, and tertiary healthcare delivery systems in India, evaluating community participation, comparing and contrasting healthcare systems in developed countries, analyzing the role of the private sector in healthcare provision, understanding the objectives, action plans, and achievements of national health programmes, analyzing the National Health Policy and its implications for healthcare delivery, identifying and annotating national health policies, and identifying and annotating national health policies.

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:

1. Introduction to healthcare delivery system -5 Hours
 - a. Healthcare delivery system in India at primary, secondary and tertiary care
 - b. Community participation in healthcare delivery system
 - c. Health system in developed countries.
 - d. Private Sector
 - e. National Health Mission
 - f. National Health Policy
 - g. Issues in Health Care Delivery System in India
2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme. -5 Hours
3. Introduction to AYUSH system of medicine. -5 Hours
 - a. Introduction to Ayurveda.
 - b. Yoga and Naturopathy
 - c. Unani
 - d. Siddha
 - e. Homeopathy
 - f. Need for integration of various system of medicine

4. Health scenario of India- past, present and future. - 2 Hours
5. Demography & Vital Statistics- - 3 Hours
 - a. Demography – its concept
 - b. Vital events of life & its impact on demography
 - c. Significance and recording of vital statistics
 - d. Census & its impact on health policy
6. Epidemiology -10 Hours
 - a. Principles of Epidemiology
 - b. Natural History of disease
 - c. Methods of Epidemiological studies
 - d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

DAOTT-002 Medical Terminology and Record keeping (including anatomical terms)
(30 Hours)

Medical terminologies and record keeping

This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests.²³ Topics to be covered under the subject are as follows:

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.

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.

Basic anatomy

- a) Introduction to Anatomy: Basic Anatomical terminology
 - Osteology- -10 Hours
 - Upper limb – clavicle, scapula, humerus, radius, ulna,
 - Lower limb - femur, hipbone, sacrum, tibia, fibula & Vertebral column
 - Thorax – Intercostal space, pleura, bony thoracic cage, ribs sternum & thoracic vertebrae - 5 Hours
 - Lungs – Trachea, bronchial tree. - 5 Hours
 - Heart – Surface anatomy of heart, chambers of the heart, valves of the heart, and major blood vessels of heart, pericardium, and coronary arteries. - 5 Hours
 - Skeleton-muscular system – Muscles of thorax, muscles of upper limb (arm & forearm) Flexor and extensor group of muscles (origin, insertion, action) 5Hours
 - Excretory system – Kidneys, ureters, bladder. - 5 Hours
 - Digestive System: - 10 Hours
 - Structure and function of the digestive system.
 - Oral cavity and digestive enzymes
 - Anatomy and function of the gastrointestinal tract
 - Absorption and digestion of nutrients
 - Common digestive disorders
 - Nervous System: -10 Hours
 - Structure and function of neurons.
 - Organization of the central nervous system (brain and spinal cord)
 - Peripheral nervous system and its divisions
 - Cranial nerves and spinal nerves
 - Basic principles of neurophysiology

Practicals in Anatomy

(30 Hours)

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

DAOTT-004 Physiology

(60 Hours)

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.

Physiology

- The Cell: - 2 Hours
 - Acid base balance and disturbances of acid base balances (Alkalosis, Acidosis)
- The Blood: - 5 Hours
 - Composition of Blood, functions of the blood and plasma proteins, classification and protein, Blood Cascade, Bleeding and Clotting time.
 - Pathological and Physiological variation of the RBC.
 - Function of Hemoglobin
 - Erythrocyte Sedimentation Rate.
 - Detailed description about WBC-Total count (TC), Differential count (DC) and functions.
 - Platelets – formation and normal level and functions.
 - Blood groups and Rh factor.
- Cardio-Vascular System: - 6 Hours
 - Physiology of the heart.
 - Heart sounds.
 - Cardiac cycle, Cardiac output.
 - Auscultation
 - Arterial pressures, blood pressure.
 - Hypertension.
 - Electrocardiogram (ECG.)
- Respiratory system: - 5 Hours
 - Respiratory ventilation
 - Oxygenation
 - Definitions and Normal values of Lung volumes and Lung capacities.

- Excretory system: - 6 Hours
 - Renal System:
 - Urine volume and specific gravity measurements
 - Renal function tests, including assessment of glomerular filtration rate (GFR)
 - Analysis of renal tubular function
 - Study of renal handling of electrolytes and water
 - Assessment of acid-base balance and renal regulation of pH.
- Reproductive system: - 4 Hours
 - Formation of semen and spermatogenesis.
 - Brief account of menstrual cycle.
- Central Nervous system: - 8 Hours
 - Functions of CSF.
- Endocrine system: - 8 Hours
 - Functions of the pituitary, thyroid, parathyroid, adrenal and pancreatic Hormones.
- Digestive system: - 8 Hours
 - Physiological Anatomy of the GIT.
 - Food Digestion in the mouth, stomach, intestine
 - Absorption of foods
 - Role of bile in the digestion.
- Special Senses: - 8 Hours
 - Vision testing and assessment of visual acuity
 - Auditory tests and assessment of hearing function
 - Study of taste and olfaction perception
 - Analysis of vestibular system and balance control
 - Assessment of proprioception and kinesthetic sense

Practical in Physiology

(30 Hours)

- Determination of Blood Groups.
- 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.
- 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.
- 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.
- Examination of Respiratory system to count respiratory rate and measure inspiration and respiration.

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.

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

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

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

a) Basics of emergency care and life support skills.

(15 Hours)

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

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

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

b) **Infection prevention and control.** (10 Hours)

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

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

c) **Bio medical waste management and environment safety.** (8 Hours)

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

- Definition of Biomedical Waste
- Waste management.
- BMW – Segregation, collection, transportation, treatment, and disposal (including color coding)
- Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- BMW Management & methods of disinfection
- Modern technology for handling BMW
- Use of Personal protective equipment (PPE)
- Monitoring & controlling of cross infection (Protective devices)

d) **Quality assurance and management.**

(12 Hours)

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

- Concepts of Quality of Care
- Quality Improvement Approaches
- Standards and Norms
- Quality Improvement Tools
- Introduction to NABH guidelines

DAOTT-006 Medical Law and Ethics, Professionalism & Values, Principles of Management **(45 Hours)**

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.

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

Medical law and ethics

(15 Hours)

Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.²⁴

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

- Medical ethics – Definition – Goal – Scope
- Introduction to Code of conduct
- Basic principles of medical ethics – Confidentiality
- Malpractice and negligence – Rational and irrational drug therapy
- Autonomy and informed consent – Right of patients
- Care of the terminally ill- Euthanasia
- Organ transplantation
- 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.
- Professional Indemnity insurance policy
- Development of standardized protocol to avoid near miss or sentinel events.
- Obtaining an informed consent.

Professionalism and values.

(10 hours)

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

Professional ethics act (2002)

1. Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality
 2. Personal values- ethical or moral values
 3. Attitude and behavior- professional behavior, treating people equally
 4. Code of conduct, professional accountability and responsibility, misconduct
 5. Differences between professions and importance of team efforts
- Cultural issues in the healthcare environment

Principals of Management

(20 Hours)

1. Principles of management: -20 Hours
 - a. Development of Management: Definitions of Management – Contributions of F.W. Taylor, Henry Fayol and others.
 - b. Functions of Management: Planning – Organizing – Directing – Controlling
Planning: Types of planning – Short-term and long plans – Corporate or Strategic Planning – Planning premises – Policies – Characteristics and sources – principles of policy making – Strategies as different from policies – Procedures and methods– Limitations of planning.
 - c. Organizing: Importance of organization – Hierarchy – Scalar chain – Organization relationship – Line relationship – Staff relationship – Line staff relationship – Functional relationship – Committee organization – Management committees – Departmentation.

- d. Motivation: Motivation theories – McGregor's theory X and theory Y – Maslow's and Herzberg's theory – Porter and Lawler model of complex view of motivation– Other theories – Diagnostic signs of motivational problems – Motivational Techniques.
- e. Communication: Types of communication – Barriers of effective communication– Techniques for improved communication.
- f. Directing: Principles relating to Direction process – Principles and theories of leadership – Leadership Styles – Delegation of authority.
- g. 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.
- h. Co-ordination: Co-ordination and co-operation – Principles of co-ordination – Techniques of co-ordination charts and records – Standard procedure instructions.
- i. Acts: CPA Act (1986 & 2019), BMW Act(1998,2016), Drugs Act(1940), IMC Act(1956), Patient Privacy – IT Rules, 2011
Medical Malpractice sections: - 304A, 337 and IPC 1860.

2. Personnel management:

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

3. Financial management:

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

DAOTT-011 Basic computers and information Science, Communication, and soft skills.
(45 Hours)

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

Basic computers and information science (25 Hours)

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

- Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.
- 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).
- Processor and memory: The Central Processing Unit (CPU), main memory.
- Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.
- 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.).
- 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.
- Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.
- Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
- Introduction of Operating System: introduction, operating system concepts, types of operating system.
- Computer networks: introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

- 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.
- Application of Computers in clinical settings.

Practical on fundamentals of computers

- 30 Hours

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

Practical Topics:

- This would involve hands-on training in computer systems and software applications. This includes learning about computer hardware components and their functions, input and output devices, processor and memory management, and storage devices.
- Practical sessions can be conducted on operating systems such as MS Windows, with a focus on navigating the desktop, managing files and folders, and working with windows and shortcuts.
- Students should also gain proficiency in using MS Word for document creation and formatting, MS Excel for data entry and manipulation, and MS PowerPoint for creating and delivering presentations.
- Additionally, practical exercises on computer networks and internet applications, including email, file transfer, and web browsing, can be provided to enhance their understanding of computer usage in clinical settings.

Communication and soft skills

Major topics to be covered under Communication course:

- 20 Hours

- Basic Language Skills: Grammar and Usage. - 2 Hours
- Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation. - 4 Hours
- Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization. - 4 Hours
- Basic concepts & principles of good communication - 2 Hours
- Special characteristics of health communication - 4 Hours
- Types & process of communication - 2 Hours
- Barriers of communication & how to overcome - 2 Hours

Practicals 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.
-

DAOTT-008: Lab Sciences

(45 Hours)

Biochemistry

- 15 Hours

- Vitamins & Minerals: Fat soluble vitamins (A, D, E, K) – Water soluble vitamins – B-complex vitamins- principal elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and sulphur)- Trace elements – Calorific value of foods – Basal metabolic rate (BMR) – respiratory quotient(RQ).
- Acids and bases: Definition, pH, Henderson – Hassel Balch equation, Buffers, Indicators, Normality, Molarity, Molality.

Haematology.

(10 Hours)

- Haemoglobin, blood cell counts, differential count.
- Anaemia, polycythaemia
- Thrombocytopenia
- Coagulation parameters- BT, CT, PT, INR, APTT
- Coagulation disorders.
- Blood transfusion-hazards and complications

Clinical Microbiology

(20 Hours)

- Morphology

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

- Growth and nutrition.

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

- Culture media Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.
- Sterilization and Disinfection: Principles and use of equipment of sterilization namely hot air oven, autoclave, and serum inspissator, pasteurization, antiseptic and disinfectants.
- Immunology.
- Immunity, vaccines, types of vaccine and immunization schedule, principles and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA.

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

Systematic Bacteriology:

- Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure and pathogenicity),
- Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.

Parasitology:

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

Mycology:

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

Virology.

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

DAOTT-009: Basic Concepts in Pharmacology

(60 Hours)

Learning Objective

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

Clinical pharmacology

- Introduction to Pharmacology. - 2 Hours
- Pharmacokinetic & Pharmacodynamics & routes of drugs administration - 4 Hours
- NSAIDs Drugs. - 4 Hours
- Ant sialagogues: Atropine, Glycopyrrolate. - 4 Hours

- Sedatives / Anxiolytics: Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, and Triclofos. - 4 Hours
- Narcotics: Morphine, Pethidine, Fentanyl, Pentazocine, tramadol. - 4 Hours
- Antiemetic's: Metoclopramide, Ondansetron, Dexamethasone - 2 Hours
- Induction Agent: Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate. - 4 Hours
- Muscle Relaxants: Depolarizing - Suxamethonium, Non depolarizing - Vecuronium, Atracurium, rocuronium. - 4 Hours
- Inhalational Gases: Gases-O₂, N₂O, Air, Agents-Ether, Halothane, Isoflurane, Sevoflurane, Desflurane - 4 Hours
- Reversal Agents: Neostigmine, Glycopyrrolate, Atropine, Naloxone, Flumazenil (Diazepam). - 2 Hours
- Local Anesthetics: Xylocaine, Bupivacaine - Topical, Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine. - 5 Hours
- Emergency Drugs : Mode or administration, dilution, dosage and effects - 15 Hours
 - Adrenaline, Atropine
 - Ephedrine, Mephentramine
 - Bicarbonate, calcium, potassium.
 - Inotropes: dopamine, dobutamine, amiodrone
 - Aminophylline, hydrocortisone, antihistaminic,
 - Antihypertensive –Beta-blockers, Ca-channel blockers.
 - Antiarrhythmic- xylocard
 - Vasodilators- nitroglycerin & sodium nitroprusside
 - Respiratory system- Bronchodilators
 - Renal system- Diuretics, frusemide, mannitol

DAOTT-010 Basics of Biomedical sciences in surgery and Anaesthesia (45 Hours)

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.

This course contains following modules:

- Introduction to Biomedical Engineering in Surgery and Anaesthesia. -4 Hours
- 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, EtCO₂ monitor, Pulse oximeter, Blood pressure monitor. - 15 Hours

- Surgical Microscope. - 2 Hours
 - Laparoscopic cart (including various scopes), Veress needle, Trocars and various instruments. - 4 Hours
 - Biomedical Imaging in Surgery and Anaesthesia. - 6 Hours
- Principles and technologies of medical imaging (e.g., X-ray, computed tomography, magnetic resonance imaging)
- Image-guided surgical procedures and interventions
- Image processing and analysis techniques for surgical planning and intraoperative guidance
- Advances in real-time imaging and its integration into surgical and Anaesthesia workflows
- Surgical Navigation and Guidance Systems. - 2 Hours
- Principles of surgical navigation systems and their applications
- Use of imaging, tracking, and registration techniques in surgical navigation.
- Anaesthesia Delivery and Monitoring. - 12 Hours
- Anaesthesia machines and delivery systems
- Design and development of Anaesthesia monitoring devices
- Physiological monitoring parameters and their interpretation during Anaesthesia
- Advances in Anaesthesia technology, such as closed-loop Anaesthesia delivery systems.

DAOTT-011: Anaesthesia Equipments and Devices

(45 Hours)

Learning Objectives:

Students will be learning about the Anaesthesia equipments and devices in this module and they will learn in details about the equipments and devices including their working principles, troubleshooting etc. which is very essential for safe practices of Anaesthesia. Student will be able to manage all the equipment and devices and their general troubleshooting in day to day working.

Course content:

1. Medical gas supply
 - a. Compressed gas cylinders
 - b. Color coding
 - c. Cylinder valves; pin index.
 - d. Gas piping system
 - e. Recommendations for piping system
 - f. Alarms & safety devices.
 - g. Scavenging of waste anesthetic gases

2. Anesthesia machine
 - a. Hanger and yoke system
 - b. Cylinder pressure gauge
 - c. Pressure regulator
 - d. Flow meter assembly
 - e. Vaporizers - types, hazards, maintenance, filling and draining, etc.
3. Breathing system
 - a. General considerations: humidity & heat
 - b. Common components - connectors, adaptors, reservoir bags.
 - c. Capnography
 - d. Pulse oximetry
 - e. Methods of humidification.
 - f. Classification of breathing system
 - g. Mapleson system - a b c d e f
 - h. Jackson Rees system, Bain circuit
 - i. Non rebreathing valves - Ambu valves
 - j. The circle system
4. Face masks & Airway laryngoscopes
 - a. Types, sizes
 - b. Endotracheal tubes - Types, sizes.
 - c. Cuff system
 - d. Fixing, removing and inflating cuff, checking tube position, complications..
5. Monitoring
 - a. Electrocardiography(ECG)
 - b. Pulse oximetry(SpO₂)
 - c. Temperature- central and peripheral
 - d. End tidal carbon dioxide(EtCO₂)
 - e. Anesthesia gas monitoring
 - f. Non-invasive blood pressure (NIPB) and Invasive blood pressure(IBP)
 - g. Central venous pressure(CVP)
 - h. PA Pressure, LA Pressure & cardiac output
 - i. Anesthesia depth monitor
 - j. Neuromuscular transmission monitor

DAOTT-012 Basic techniques of Anaesthesia**(60 Hours)****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.

Basics Techniques of Anesthesia

- 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. - 4 Hours
- b. Anaesthesia Machine: Design, Components, and Functionality. - 6 Hours
- c. Safety systems in Anaesthesia machine. Flow systems, CO2 Absorbents, Circuit types, Humidification devices. - 6 Hours
- d. Perioperative Fluid Management: Strategies and Considerations. (Crystalloids and Colloids). - 4 Hours
- e. Perioperative Emergency Medications: Indications, Administration, and Management. - 4 Hours
- f. Anaesthetic induction and airway management: Learning about various induction techniques, airway devices, and strategies for maintaining a patent airway during surgery. - 8 Hours
- g. Brief Idea about Pre medication, Pre oxygenation or Denitrogenating, Induction and inducing agents, Sellick's maneuverer, Vaporizers, Principles and types, Intubation and reversal agents. - 6 Hours
- h. 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. - 6 Hours
- i. Pain management and analgesia: Exploring different methods of perioperative pain management, including systemic analgesics, regional Anaesthesia, and patient-controlled analgesia. - 4 Hours
- j. Anaesthetic 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. - 4 Hours

- k. Anaesthetic 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. - 4 Hours
- l. 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. - 4 Hours

Practical or Clinical posting topics:

(75 Hours)

- Preoperative assessment and patient preparation include performing simulated preoperative assessments such as history taking and physical tests.
- Using patient features to stratify risk and make decisions for anesthesia treatment.
- Anesthesia machine and safety systems: Familiarization with the components and functionality of an anaesthesia machine through hands-on experience.
- Regional anesthesia procedures: Training in various regional anaesthesia techniques, such as peripheral nerve blocks and epidurals, using simulation.
- Management of anesthesia-related complications
- Simulation of anesthesia-related problems such as airway obstruction, hypotension, and allergy through role-playing.

DAOTT-013 Basics of Surgical procedures

(60 Hours)

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.

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

Basics of Surgical procedures

- a. Layout of Operation Theatre, WHO Checklist, Carbolization and Fumigation: - 6 Hours
- b. Introduction to general surgical procedures: Understanding the principles, indications, and techniques of common general surgical procedures, such as appendectomy, cholecystectomy, and hernia repair. - 6 Hours
- c. 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. - 6 Hours
- d. Diseases in General Surgical Practice : Appendicitis, Hernias, cholecystitis, Gastrointestinal (GI) Cancers, Peptic Ulcer Disease. - 6 Hours
- e. Diseases in Obstetric/ Gynaecologic Practice" : Ectopic Pregnancy, Pelvic Inflammatory Disease (PID), Endometriosis, Fibroids, Ovarian Cysts, Cervical and Ovarian Cancers. - 6 Hours
- f. Incision and wound closure techniques: Studying various surgical incision types, wound closure methods (such as sutures, staples, and adhesive tapes), and wound dressing principles. - 6 Hours
- g. Surgical instrument identification and handling: Familiarizing with surgical instruments commonly used in general surgery and obstetrics and gynaecology, and understanding their functions, proper handling, and maintenance. - 6 Hours
- h. 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. - 6 Hours
- i. 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. - 6 Hours
- j. Common general surgical procedures in obstetrics and gynaecology: Studying the specific surgical procedures performed in obstetrics and gynaecology, such as caesarean section, hysterectomy, and ovarian cystectomy, and their related considerations. - 6 Hours

Practical / Clinical Postings topics: (75 Hours)

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

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

Suturing materials and suturing techniques will be demonstrated.

Scenarios were created to emphasize the need of keeping a sterile area and avoiding contamination during surgical procedures. Gloving, Gowning and Draping Techniques.

Identification and uses of surgical instruments.

Anaesthesia and patient positioning: Demonstration and practice of patient positioning techniques for general surgical operations, taking into account patient safety, accessibility, and the demands of the surgeon.

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

BAOTT-014 CSSD & Manifold Area

(45 Hours)

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.

CSSD Procedures

- 30 Hours

- a. Introduction to Central Sterile Services Department (CSSD): Understanding the role and importance of CSSD in maintaining infection control and providing sterile instruments and equipment for surgical procedures. - 3 Hours
- b. Sterilization methods: Exploring various sterilization methods used in CSSD, such as steam sterilization (autoclaving), ethylene oxide (ETO) sterilization, hydrogen peroxide plasma sterilization, and chemical sterilization. - 10 Hours
- c. Decontamination processes: Learning about the decontamination procedures involved in CSSD, including manual cleaning, mechanical cleaning (using ultrasonic cleaners), and enzymatic cleaning. - 4 Hours
- d. Instrument preparation and packaging: Understanding the proper techniques for instrument cleaning, inspection, assembly, and packaging to ensure their sterility and safe use in surgical procedures. - 3 Hours
- e. Sterile storage and distribution: Studying the appropriate storage and distribution methods in CSSD, including maintaining proper inventory control, implementing first-in-first-out (FIFO) system, and ensuring proper labeling and documentation. - 2 Hours
- f. Quality assurance and control: Exploring the quality assurance and control measures in CSSD, including biological and chemical monitoring of sterilization processes, documentation, and compliance with regulatory standards. - 4 Hours

- g. Infection control practices: Understanding the principles of infection control in CSSD, including hand hygiene, personal protective equipment (PPE) usage, aseptic techniques, and prevention of cross-contamination. - 2 Hours
- h. Equipment maintenance and troubleshooting: Learning about the maintenance and troubleshooting procedures for CSSD equipment, such as sterilizers, washers, and drying cabinets, to ensure their optimal performance. - 2 Hours

Manifold:

(15 Hours)

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

Emergency Response and Gas Shutdown Procedures,

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

Practical Sessions for CSSD & Manifold Area:

(30 Hours)

CSSD Procedures:

25 Hours

- Sterilization Methods:
- Autoclave Operation: Students will learn how to operate an autoclave for steam sterilization.
- Chemical Sterilization: Students will be introduced to chemical sterilization methods, such as using high-level disinfectants or low temperature sterilant.
- Decontamination Processes:
- Manual Cleaning Techniques: Students will practice manual cleaning techniques for decontaminating surgical instruments.
- Ultrasonic Cleaner Operation: Students will operate an ultrasonic cleaner and learn about its role in mechanical cleaning.
- Sterile Storage and Distribution
- Inventory Management: Students will learn how to maintain an organized inventory system in the CSSD.

Manifold Area:

(5 Hours)

- Hospital Manifold Systems:
- Manifold System Components: Students will explore the layout and components of a hospital manifold system.
- They will learn about the gas sources, pressure regulation devices, alarms, and safety features present in the system.
- Emergency Equipment Familiarization: Students will familiarize themselves with emergency equipment, such as gas shut-off valves, pressure relief devices, and emergency alarms.
- Troubleshooting and Problem-Solving: Manifold System Maintenance: Students will learn about common issues that can arise in the manifold system and practice troubleshooting techniques.

DAOTT-015 Basic Intensive Care

(45 Hours)

Learning Outcomes

- Recognize proper care and maintenance practices for ventilators, suction machines, and monitoring equipment.
- Check, clean, and troubleshoot this equipment on a regular basis.
- Recognize prevalent flaws and take corrective action.
- Understand the concepts of ventilator sterilization and disinfection.
- Recognize the proper sterilization processes and disinfectants for ventilators.
- Know how to care for, maintain, and operate beds, lights, and other pieces of equipment.
- Recognize the significance of air conditioning and pollution control in the ICU setting.
- Recognize HVAC systems and air filtration procedures in order to maintain air quality.
- Be familiar with the attachment and intraoperative use of ventilators and monitoring devices.
- Adult and pediatric patients who are unconscious are cared for.
- Recognize unique care requirements, such as posture, hygiene, and monitoring.
- Recognize and manage any potential difficulties or crises that may arise while caring for unconscious patients.
- Become familiar with physiotherapy procedures, feeding, Ryle's tube insertion, and hyperalimentation.
- Recognize suctioning and posture techniques in semiconscious and unconscious patients.
- Understand the concepts and procedures of oxygen therapy, including identifying and selecting appropriate delivery systems and masks based on patient needs.
- Assess ventilation during a patient emergency.
- Assist with ventilation using mouth-to-mouth, mouth-to-ET tube, or bag-valve mask construction procedures.
- Depending on the patient's condition and response, implement suitable ventilation methods.

Course Outcomes:

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

Basic Intensive Care

- Care and maintenance of ventilators, suction machine, monitoring devices. - 2 Hours
 - Sterilization and disinfection of ventilators. - 1 Hour
 - Care, maintenance and operational capabilities of beds, lights and other apparatus. - 1 Hour
 - Air conditioning and control of pollution in ICU. - 1 Hour
 - Attachment and intraoperative utility of ventilators and monitoring devices. - 1 Hour
 - Care of unconscious adult and paediatric patients. - 3 Hours
 - Physiotherapy techniques, feeding, Ryle's tube insertion and hyperalimentation. - 3 Hours
 - Suctioning and posturing of semiconscious and unconscious patients. - 2 Hours
 - Oxygen therapy, maintenance of clear Airway, Various types of masks. - 4 Hours
 - Ventilation of patient in crisis: - 2 Hours
 - Resuscitator/ bag valve mask assembly - 2 Hours
 - Different types of Airways. - 2 Hours
 - Short term ventilation/ Transport ventilators. - 1 Hour
 - ABG techniques & analysis. - 2 Hours
 - Management of asepsis. - 2 Hours
 - Psychological aspects of the patient, relative and staff. - 2 Hours
 - Hemofiltration and hemodialysis. - 4 Hours
 - Jet Ventilation. - 2 Hours
 - Ventilators: Principles of working of different ventilators: - 8 Hours
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- Volume cycled/Time cycled/Pressure cycled ventilators.
 - High frequency ventilators and other types.
 - Methods of measuring the expired gases from the patient; Types of spirometers, Principles of working of spirometers. Clinical application of above apparatus.

- Apparatus and techniques of measuring of blood pressure and temperature; Principle and working of direct/indirect blood pressure monitoring apparatus; structure, principle and working of the oscillotonometer. Principles and working of aneroid manometer type B.P. instrument.
- Laryngeal sprays; Types, material, principle and mechanism.
- Monitoring techniques and equipment; Cardiac monitors, Respiratory monitors, Spirometers, Temperature monitors.

Practicals/ Clinical Postings:

(75 Hours)

a) Ventilator Care and Maintenance:

- Hands-on practice in the proper care and maintenance of ventilators, including cleaning, sterilization, and disinfection techniques.
- Understanding the functions and operation of different modes and settings of ventilators.
- Troubleshooting common ventilator issues and alarm management.

b) Bed and Apparatus Care:

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

c) Air Conditioning and Pollution Control in ICU:

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

d) Care of Unconscious Patients:

- Simulation-based training on the care and management of unconscious adult and pediatric patients, including monitoring vital signs, maintaining airway patency, and providing basic hygiene.
- Practice in the proper positioning and turning techniques for unconscious patients to prevent pressure ulcers.

e) Oxygen Therapy and Airway Management:

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

f) Physiotherapy Techniques and Feeding Methods:

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

g) Hemofiltration and Hemodialysis:

- Introduction to the principles and techniques of hemofiltration and hemodialysis for renal replacement therapy.
- Simulation-based training on the setup and operation of hemofiltration and hemodialysis machines, including the monitoring of patients during the procedure.

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

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

DAOTT- 016: Disaster Management & Environmental Sciences

(45 Hours)

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.

Disaster preparedness and management-

(20 Hours)

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

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

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



DAOTT-017: Advanced Anaesthesia Techniques

(60 Hours)

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 advanced anaesthesia techniques. Anaesthetic considerations 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.

Course Outcome

The course aims to equip students with the skills to:

1. Anaesthetic considerations for advanced surgeries: Demonstrate understanding of challenges and techniques involved in providing Anaesthesia for advanced procedures, apply appropriate methods and strategies for maintaining airway patency, and implement pain management protocols.
2. Airway management in difficult airway cases: Use of advanced techniques like Fiberoptic intubation, supraglottic airway devices, and video laryngoscopy to maintain airway patency and manage complications.
3. Local and regional anaesthesia techniques for head and neck procedures: Demonstrate proficiency in administering local anaesthetics and performing nerve blocks, and select and apply regional techniques based on surgical requirements.

Advanced Anaesthesia Techniques

- 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.
- Airway management in difficult airway conditions and procedures: Learning about advanced airway management techniques, such as fiberoptic intubation, supraglottic airway devices, and video laryngoscopy, for securing the airway during ENT surgeries.
- 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.
- Paediatric Anaesthesia techniques and considerations: Understanding the unique physiological and pharmacological considerations for providing Anaesthesia to paediatric patients, including preoperative preparation, induction, airway management.

- Anaesthesia for urological surgeries: Learning about the specific Anaesthesia considerations and techniques for urological procedures such as prostatectomy, nephrectomy, and cystoscopy.
- 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: Advanced Anaesthesia Techniques

(30 Hours)

- Hands-on practice in paediatric airway care using suitable devices and techniques, such as mask ventilation, intubation, and supraglottic airway devices.
- Simulation scenarios concentrating on the special issues for inducing and maintaining anaesthesia in paediatric patients, including as dose calculation, monitoring, and intraoperative care.
- This course provides a practical demonstration of anaesthetic considerations and techniques for various urological, orthopedic and pediatric surgeries.
- Training in patient positioning and patient preparation, including the use of regional anaesthetic and intravenous sedation procedures.
- Techniques of Regional Anaesthesia.
- Practical experience with peripheral nerve blocks, including landmark recognition, needle insertion, and local anaesthetic administration.
- Training in spinal anaesthetic procedures using simulation, including patient placement, sterile technique, and dose calculation.

DAOTT-018: Advanced Surgical Procedures

(45 Hours)

Learning Objectives:

The learning objectives cover various aspects of Ear Nose & Throat (ENT), Ophthalmology, orthopedics, Paediatric surgery, urological surgeries. Understanding the principles and techniques involved in surgical management of these patients.

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

Advanced Surgical Procedures

- 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.
- 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 surgery.
- Urological Surgeries including Ureteroscopy, Transurethral Resection of the Prostate (TURP), Transurethral Resection of Bladder Tumor (TURBT), Radical Cystectomy, Nephrectomy etc. and patient positing for these surgeries.
- Pediatrics surgical procedures such as Pediatric hernia repair, pyloromyotomy, congenital anomaly correction, and Paediatric laparoscopic surgeries, and understanding the specialized considerations, techniques for Paediatric patients and positioning.
- Common Surgeries in Ophthalmology like Cataract Extraction and Intraocular Lens (IOL) Implantation, Trabeculectomy, Shunt Implantation, Laser Therapy, Vitrectomy, Retinal Detachment Repair, Corneal Transplantation (Keratoplasty) etc.

DAOTT- 019: Specialized Anesthesia and Surgery

(45 Hours)

Learning Objectives

The learning objectives include anaesthetic considerations for cardiovascular and thoracic surgery, as well as hemodynamic management strategies and monitoring approaches. They also cover central venous catheters, arterial line insertion, cardiac bypass and valve replacement procedures, controlling hemodynamic changes during cardiothoracic surgeries, and neurosurgery.

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

The course also covers anaesthesia considerations for neurosurgical procedures, including patient positioning, intracranial pressure management, and neurophysiological monitoring. It also emphasizes patient safety during brain and spine surgeries. Neuroanesthesia techniques and monitoring in neurosurgery include total intravenous Anaesthesia (TIVA) and neurophysiological monitoring methods to optimize surgical conditions and patient outcomes.

Course Content

- Anaesthetic 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.
- Central Venous catheter and various insertions techniques(IJV, Femoral, PICC and subclavian), Arterial Line insertion and various techniques(including Allen's test)
- Anaesthesia techniques for cardiac bypass and valve replacement procedures: Learning about, cardiopulmonary bypass management, and strategies for maintaining stable hemodynamic during open-heart surgeries.
- 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.
- Anaesthetic considerations for neurosurgical procedures: Understanding the unique challenges and considerations in providing Anaesthesia for brain and spine surgeries, including patient positioning.
- Common cardiothoracic and vascular surgeries like Coronary Artery Bypass Grafting (CABG), Valve Repair and Valve Replacement surgeries: (Surgical removal of the damaged valve and implantation of a prosthetic valve.), Aneurysm Repair, Cardiac Defect Repair: such as atrial septal defect (ASD), ventricular septal defect (VSD), or Tetralogy of Fallot.
Common 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).

DAOTT-020 Recent Advancements in Anesthesia and Surgery Learning Objectives

(75 Hours)

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

Recent Advancements in Anesthesia and Surgical Fields

Minimally Invasive Surgery: Exploring the advancements in minimally invasive surgical techniques, such as laparoscopy, robotic surgery, and endoscopic procedures, and their benefits in terms of reduced trauma, faster recovery, and improved patient outcomes. - 15 Hours

Enhanced Recovery After Surgery (ERAS): Understanding the concept of ERAS protocols, which involve a multidisciplinary approach to optimize patient preparation, surgical techniques, anaesthesia management, and postoperative care, leading to shorter hospital stays, reduced complications, and enhanced recovery. - 10 Hours

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. - 10 Hours

Advances in Anaesthetic Techniques: Exploring recent developments in anaesthetic techniques, including total intravenous anaesthesia (TIVA), target-controlled infusion (TCI), BIS monitoring, CNAP monitoring and the use of neuromuscular monitoring to improve drug dosing and patient safety during anaesthesia. - 10 Hours

Perioperative Pain Management: Discussing novel approaches and advancements in perioperative pain management, such as the use of multimodal analgesia techniques, regional anaesthesia, and the role of non-opioid analgesics in reducing opioid consumption and improving pain control. - 10 Hours

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. - 5 Hours

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. - 10 Hours

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. - 5 Hours

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.

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

Research Methodology and Biostatistics

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

- Introduction to research methods - 5 Hours
- Identifying research problem - 5 Hours
- Ethical issues in research - 5 Hours
- Research design - 5 Hours
- Basic Concepts of Biostatistics - 5 Hours
- Types of Data - 5 Hours
- Research tools and Data collection methods - 5 Hours
- Sampling methods - 5 Hours
- Developing a research proposal - 5 Hours

Fifth Semester – Internship

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

Stipend

There should be provision to provide the stipend to the students while undergoing internship after successfully completing the course curriculum. The amount of stipend provided every month to the student interns should not be less than Rupees 20000 keeping in mind the occupational hazards and challenges faced while working full time in patient care areas including operation theatres and intensive care units of the hospitals housing the highly infectious and critical patients.

Professionalism in the Operating Room and Anaesthesia Technologists:

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

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

Here are some crucial professional conduct guidelines to remember:

- **Patient Security:** To reduce the risk of mistakes and problems during surgical and anaesthesia operations, adhere to established protocols and recommendations.
- **Maintain a clean and sterile operating room environment** by following infection control procedures.
- **Competence and Professional Development:** Strive for excellence in your profession on a regular basis.
- **Keep up to date on the most recent innovations and best practices** in operation theatre and Anaesthesia Technology.
- **Maintain a professional look and demeanor** by following to the authorized dress code and wearing adequate personal protection equipment (PPE) in the operation theatre.
- **Maintain a cheerful and polite demeanor** towards patients, coworkers, and other healthcare professionals.
- **Empathy, compassion, and attention to the needs and concerns of patients and their families** are required.

- Communication abilities: Improve your verbal and written communication abilities.
- Policy and protocol adherence: Familiarize yourself with the institution's or facility's standard operating procedures and policies.
- Professional Honesty: Maintain the finest professional ethics.
- Be truthful, dependable, and accountable for your activities.
- Avoid any activity that may jeopardize the integrity of the profession or patient care.
- Recognize and appreciate the contributions of a diverse healthcare workforce.
- Continuous Improvement: Adopt a continuous improvement mentality.
- To improve your abilities and performance, seek feedback from superiors, coworkers, and patients.
- By following these professional behavior norms, Anaesthesia & Operation Theatre Technologists may help to provide safe, efficient, and compassionate treatment in the surgical context.

