



**National Commission for Allied and Healthcare Professions**

**COMPETENCY BASED CURRICULUM**

for

**Bachelors of**

**Emergency Medical Technologist (Paramedic)**

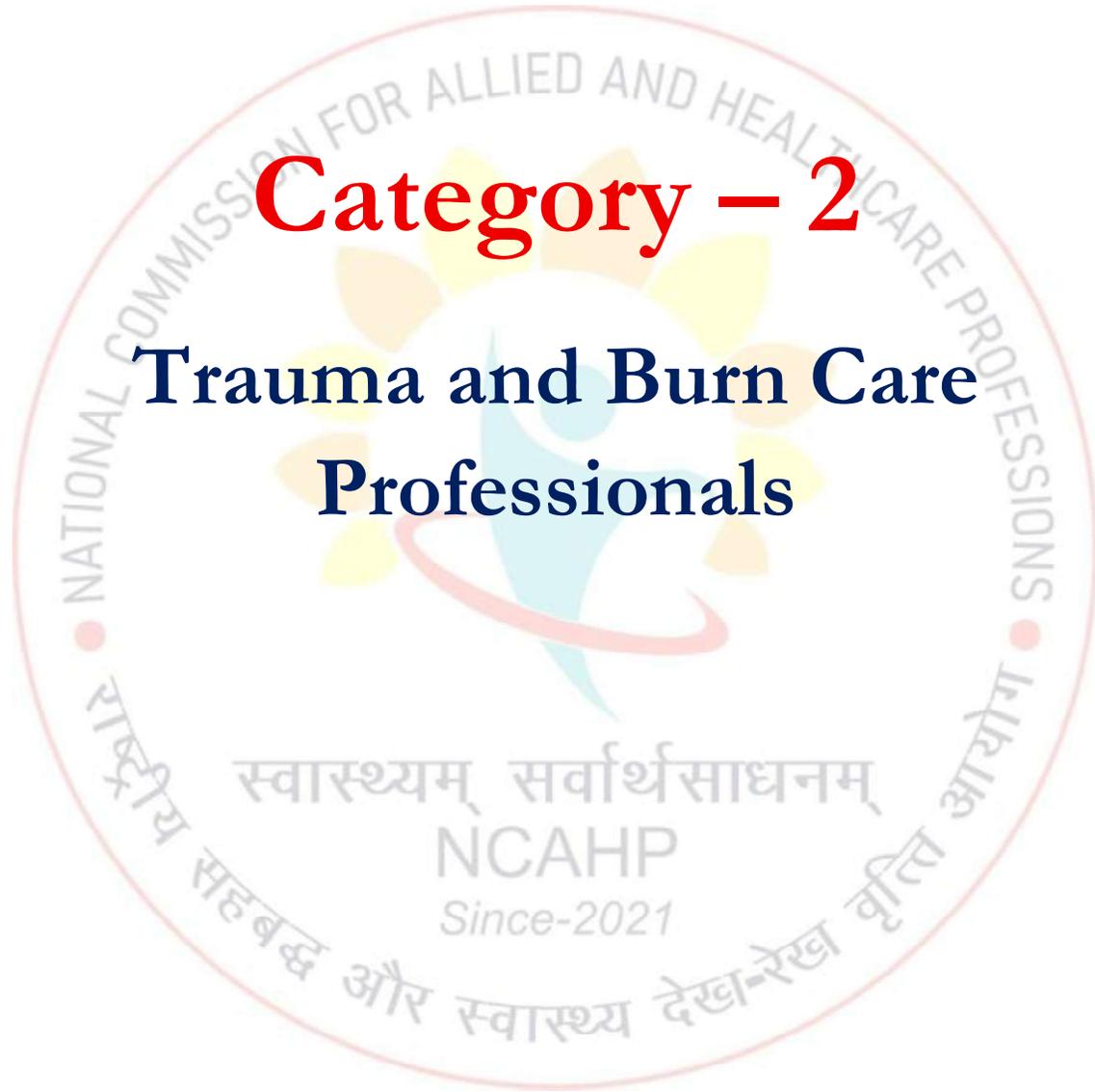
and

**Masters of**

**Advanced Care Paramedic**



**As per NCAHP Act 2021**



# Category – 2

## Trauma and Burn Care Professionals

# **APPROVED SYLLABUS 2025**



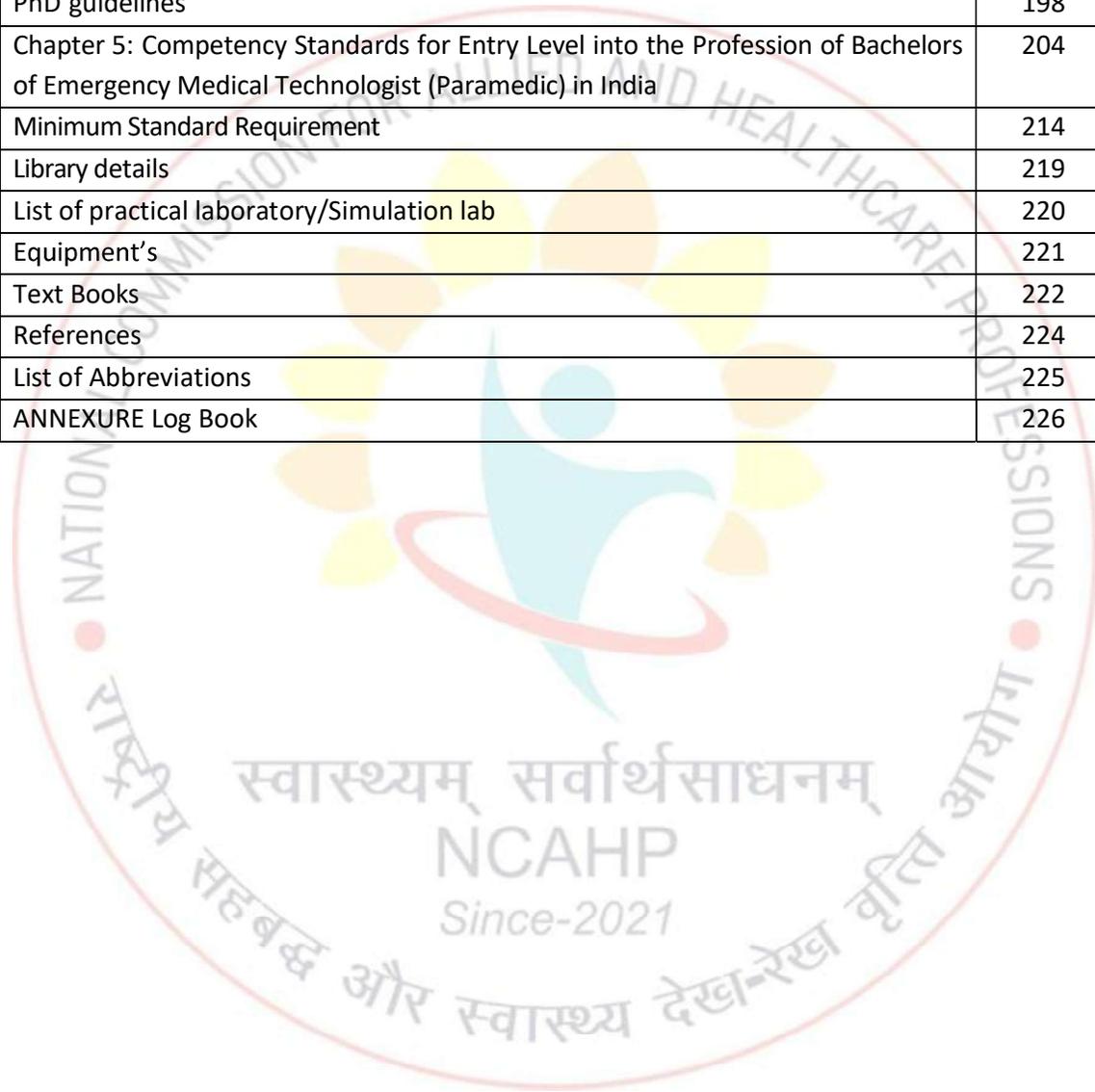
**Ministry of Health and Family Welfare**



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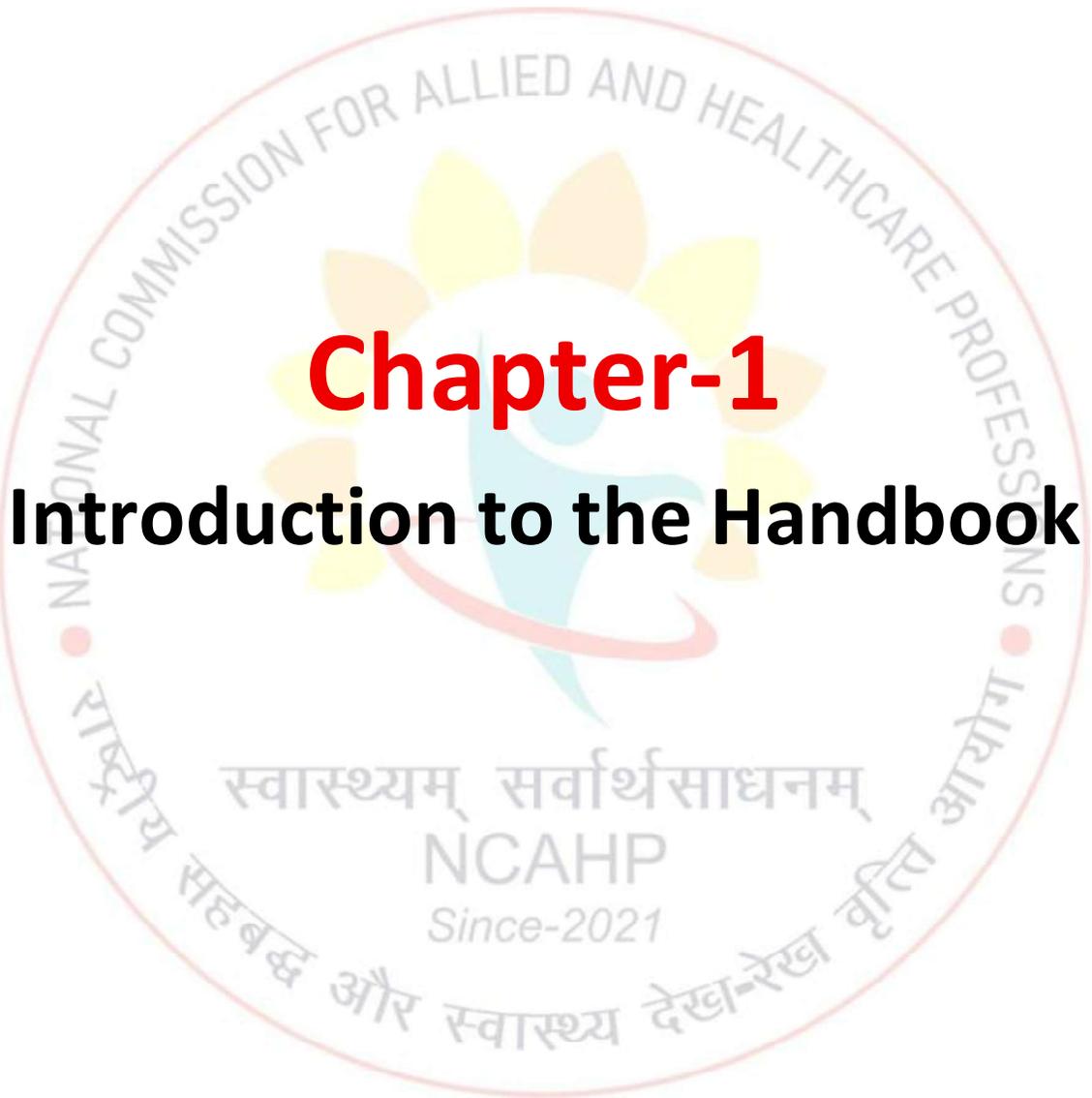
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# Chapter-1

## Introduction to the Handbook

## 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 the 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 having 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. Based on the recommendations of the NCAHP Act this handbook can also guide the thousands of young adults who choose healthcare as a profession 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) include 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.'*

The National Commission for Allied and Healthcare Professions Act, 2021 (The NCAHP Act 2021) was passed by Rajya Sabha on March 16, 2021, and by Lok Sabha on March 24, 2021. The Government notified it in the Gazette of India on March 28, 2021, after it received the assent of the President. The Act provides for "regulation and maintenance of standards of education and services by allied and healthcare professionals, assessment of institutions, maintenance of a Central Register and State Register" of professionals.

NCAHP Act is to provide for regulation and maintenance of standards of education and services by allied and healthcare professionals, assessment of institutions, maintenance of a Central Register and State Register and creation of a system to improve access, research and development and adoption of latest scientific advancement and for matters connected therewith or incidental thereto.



## 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. Professionals that can competently handle sophisticated machinery, advanced protocols and interpret reports and analyze results are now in high demand globally. In fact, diagnosis is now so dependent on technology, that allied and healthcare professionals (AHPs) are vital to diagnosis and successful management

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, the Indian healthcare system still revolves around the doctor-centric approach leading to long waiting lists and delayed treatments. 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 reduce chronic workforce shortages and improve patient access in a range of locations and special 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. 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, Allied health professionals are capable of providing a broad range of diagnostic, technical, therapeutic and direct health services to improve the health and wellbeing of the consumers they support. 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 within this spectrum, Emergency Medical Services (EMS) and prehospital care paramedics have emerged as a critical workforce, addressing the urgent need for timely interventions and transport in emergency situations.
- With an understanding of the healthcare issues associated with diverse socio-economies and cultural norms within the society
- To provide management and rehabilitative therapies to patients/individuals where non- surgical treatments are indicated or advocated.

### **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 post-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 level- PhD)
9. Lifelong learning

## 1. Clinical Care

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

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

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 physicians. 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 excellence**

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 mentorship**

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 Responsibility**

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. 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

## 8. Scientific attitude and Scholarship

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 learning

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 salient 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.

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

### **Credit hours**

Globally, a need 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.

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.

More importantly the allied and health care professions are now defined for its qualification of the degree in terms of completion or coverage of academic hours. The definition of the allied health and health care professional as per the NCAHP Act is provided below:

“Allied Health Professional” includes an associate, technician or technologist who is trained to perform any technical and practical task to support diagnosis and treatment of illness, disease, injury or impairment, and to support implementation of any healthcare treatment and referral plan recommended by a medical, nursing or any other healthcare professional, and who has obtained any qualification of diploma or degree under this Act, the duration of which shall not be less than two thousand hours spread over a period of two years to four years divided into specific semesters;

“Healthcare Professional” includes a scientist, therapist or other professional who studies, advises, researches, supervises or provides preventive, curative, rehabilitative, therapeutic or promotional health services and who has obtained any qualification of degree under this Act, the duration of which shall not be less than three thousand six hundred hours spread over a period of three years to six years divided into specific semesters

### **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.

This 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 through the final years of the training, making clinical exposure and learning more dominant. 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. 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**

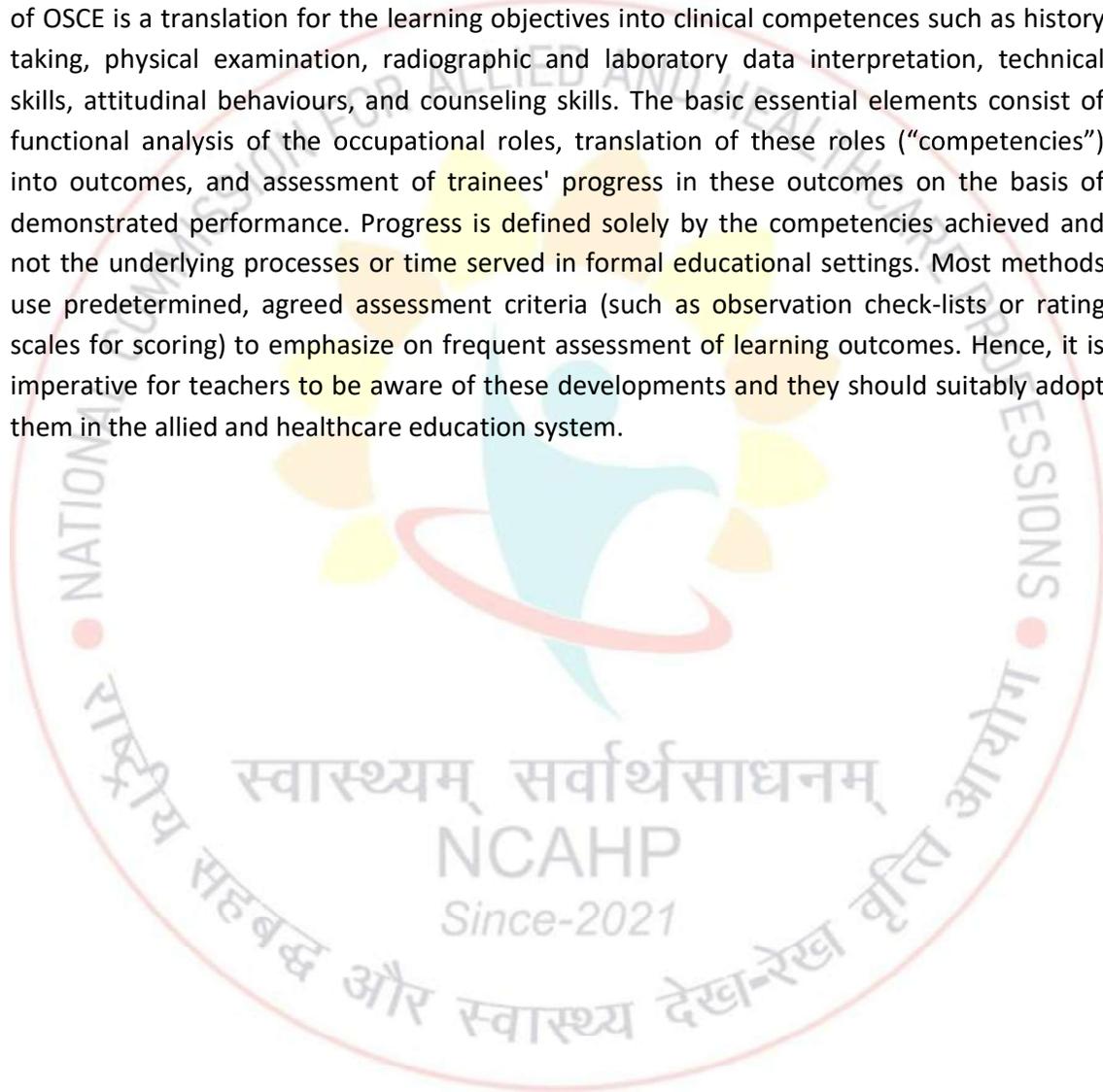
Teaching modality	Learning opportunity examples
Patients	Teach and assess in selected clinical scenarios
	Standardized patients -Practice soft skills, interpersonal interactions
	Practice physical examination
	Receive feedback on performance
Mannequins Low-Fidelity and High-Fidelity Mannequins	Perform acquired techniques advanced clinical decision-making, resuscitation, trauma care, and critical incident management
Task Trainers	Anatomical models used for specific skill acquisition
	Hand-on skill mastery
Simulation education	Practice teamwork and leadership
	Scenario-Based Learning
	Debriefing and Reflection
	Competency Assessment
	Comprehensive skill development

### Assessment methods

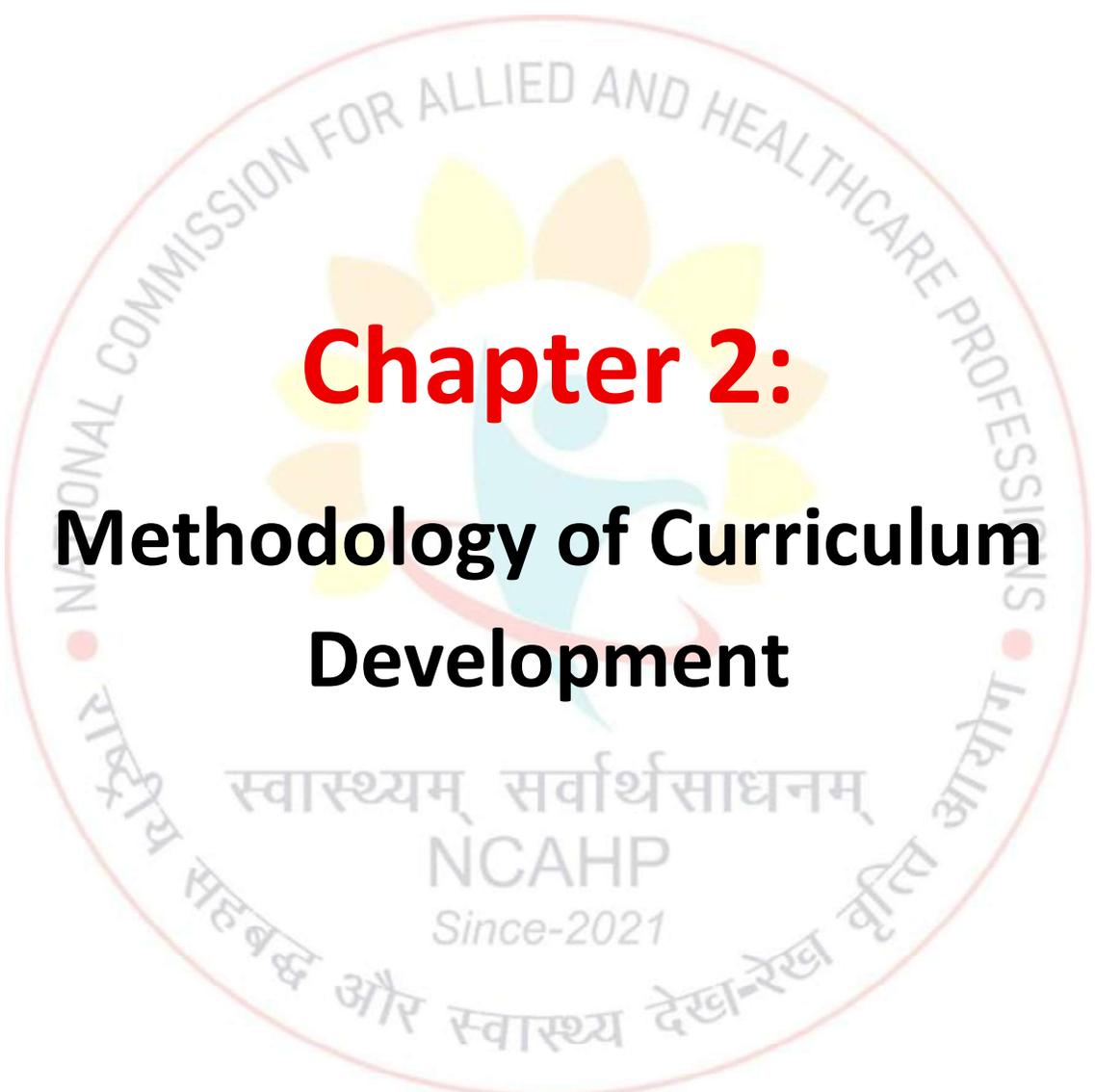
Traditional assessment of students consists of the yearly system of assessments. In most institutions, assessments consist of internal and external assessments, and a theory examination at the end of the year or semester. This basically assesses knowledge instead of assessing skills or competencies. 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 considered as a standard summative and formative assessment method wherein it is a comprehensive and standardized tool assessing the clinical competencies including psychomotor domain, attitudes, and behaviours that will be manifested in the real work of Allied and Healthcare especially in the Bachelors of Emergency Medical Technologist (Paramedic) graduates. Therefore, the implementation of OSCE depends on the design of a blueprint that consists of two axes; the first axis is the tested competencies according to the learning objectives while the second axis represents a system or problem that is related to these competencies. Thus, the blueprint of OSCE is a translation for the learning objectives into clinical competences such as history taking, physical examination, radiographic and laboratory data interpretation, technical skills, attitudinal behaviours, and counseling skills. 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.







# **Chapter 2:**

# **Methodology of Curriculum Development**

## 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.

Following the NCAHP Act and aligning with the provisions for the regulation and maintenance of standards of education and services by allied and healthcare professionals, the need for uniform standard curriculum and up gradation of the curriculum according to the current needs of the country is sought. Considering the standards of the professions from across countries and referring to the changes in the curricula across international and national reputed universities and institutions, this curriculum including a comprehensive and globally acceptable set of educational standards based on a skills and competencies approach was arrived at. Opinions of key members of the profession were also sought.

Steps undertaken in the curricula review process

A meeting was convened on 22.11.2023 with the Interim Commission subject experts followed by a series of meetings with experts from across the country from 22.11.2023 to 24.11.2023 to develop model curricula of Curriculum for "Trauma and Burn Care Profession". Several issues were discussed pertaining to the courses running in the country including nomenclature issues, lack of practical exposure, mushrooming of institutions, and lack of educational standards among several others.

All the experts deliberated on the issues and a consensus was attained on the following thematic areas.

1. **Minimum curricula guidelines** are to be designed for Trauma care profession.
  - Curricula should be patient-centric and futuristic.
  - Must include the latest advancement in technology.
  - Should be aligned with global standards and allow global mobility
2. All programs should be delivered in full-time mode and no institution should deliver any part-time or distance program in the healthcare sciences.
3. **Curricula must consider**
  - Definition of the profession
  - Entry criteria to the profession
  - Entry qualification to the profession- Bachelor level programs desired in the profession other than entry qualification
  - Nomenclature of the qualifications
  - Duration of each level of the program with the duration of the internship.
  - Must-have competencies at the end of each level and competencies must drive the curriculum content.

- Program evaluation framework/ assessment at the end of each program
  - Number of desired faculty (with hierarchy/ designation) and defined minimum qualifications for each level of the program
  - Batch size and student and faculty ratios
  - Details of reference books, journals and desirable and essential equipment must also be considered.
4. **A pre-determined credit-based system** is to be followed for Trauma care that ensure a basic minimum competency in essential subjects:
- Credits and the number of hours must be allocated to each subject.
  - While lateral entry and bridge programs can be devised for existing professionals for entry, multiple exits may not be implemented.
5. **Common entrance mechanism to be considered for Trauma and burn care programs:**
- Universities can consider He/she has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board in biology/Botany, Zoology physics, chemistry, Admission is done based on the NEET appeared candidates followed by a counselling session.
6. **The medium of teaching should be 'English'**
- Students from other boards without English as a compulsory subject may be encouraged to pick English as an elective from available resources on Swayam and similar platforms.
  - The completion of the course will not lead to any university course credit (non- university course).
7. **Competency framework** (including performance criteria and related knowledge, skill and behaviours) to be included in each level of the program.
- Competencies should be measurable and aligned with assessments.
  - Foundations Courses may be spread across the length of the program and weightage to the content/ number of hours/credits may vary as per the requirement of individual professions.
  - Soft skills and communication to be focused.

8. **All programs must have a mandatory internship**

- The length of the internship will be determined by the extent of competencies to be attained by the candidate after the program.
- Clinical programs can also mandate **rotatory internships** to increase the level of clinical exposure to the students
- Teaching institutions should be accountable for ensuring the internship of the students in the affiliated hospital, as it is part of the academic program.
  - Standalone institutions must have a MoU with either a medical college or hospital or healthcare facility as per the guidelines (desired number of OPD etc.) 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.
- Stipend of reasonable amount must be paid for internship students.
- Internships cannot be reflected as work experience as those are part of the academic program.
- Studentship or observership must also be in built into the curriculum.
  - Simulation and skill labs can be used for practicing skills specific to the program if available in the initial years of observership / studentship.
  - Some hours in every semester can be considered for seminars/workshops on new developments/ technologies.
- If the clinical facility is not within the same campus, transportation should be provided to the students and interns.
- All practical skills must be supervised and recorded in a digital Logbook and skills to be evaluated after the completion of the internship.

9. Masters program should be promoted to develop specialization in the field and generate trained faculty in the field

- All Master programs must focus on research and engage with industry partners to promote innovation and development in the field
- Industry experts can be engaged as guest faculty/ conduct seminars under the framework of programs.

10. It was agreed upon that an exit examination (including testing of skills and competencies) will be potentially conducted by a third-party agency or organization as eventually identified by the ICAHP/ NCAHP. This can also evolve as a licensure examination for Trauma and burn care professionals.

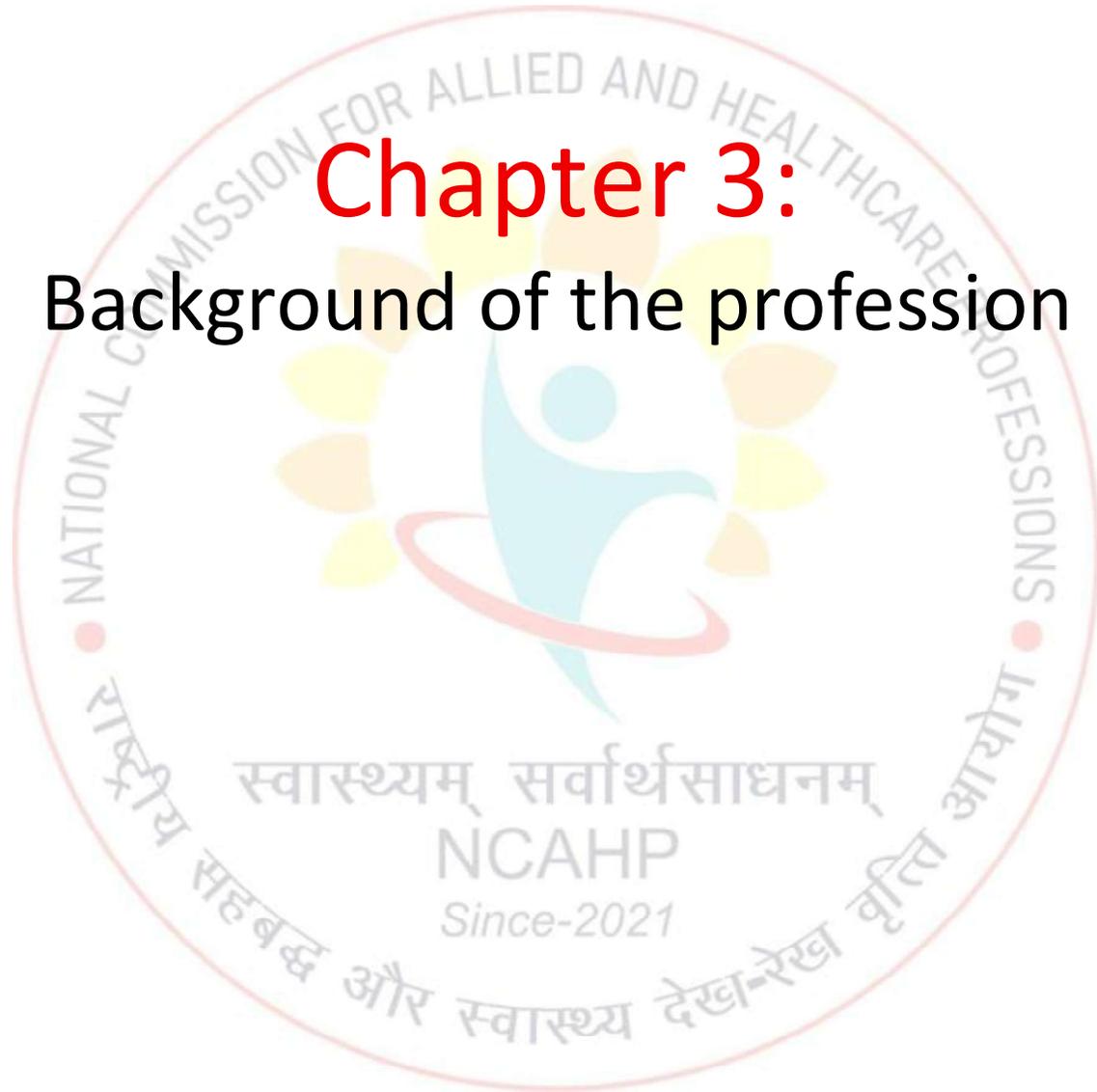
The Ministry has appointed members of the task force from various regions of India to ensure wide geographic representation, catering to diverse needs across the nation. Feedback on amendments to the syllabus scheme, including program duration, incorporation of recent developments in courses, alterations in course positioning and credit distribution, was solicited from task force members and institutional representatives. Meetings were convened multiple times, totaling approximately 10 to 15 sessions, each lasting 2 to 3 hours, resulting in a cumulative effort of 30 to 40 hours to finalize the curriculum. Additionally, input was sought on assessment methods and faculty requirements, with relevant updates made to textbooks. Competencies pertaining to knowledge, skills, and attitudes were delineated for both undergraduate and postgraduate programs.





# Chapter 3:

## Background of the profession



## Statement of Philosophy– Why this profession holds so much importance

Emergency Medical Services (EMS) represent the front line of healthcare, delivering rapid, precise, and compassionate care in life-threatening situations. The foundational philosophy of EMS emphasizes the intrinsic value of every life and the critical role timely intervention plays in patient outcomes, during the “golden hour” following emergencies.

In India, EMS extends beyond mere service provision, acting as a critical bridge connecting emergency scenes to definitive medical care, in all areas of country especially in remote and underserved regions. The profession upholds essential values, such as human dignity, equity, and resilience.

Structured EMS systems in India were absent before the 1980s. Ambulances served only as transport vehicles without medical intervention capabilities. A significant advancement occurred in 1985 when the Association for Trauma Care of India established the country’s first centralized EMS system connecting 15 ambulances via a wireless dispatch network.

The formalization of emergency medicine as a medical specialty began in the early 1990s, although emergency departments continued to face challenges because of staffing by general practitioners lacking specialized training. This often led to delayed and inadequate care, impacting patient survival rates. **“In the 2000s, many private and hospital-based EMS systems across various states in India began initiating efforts to serve their communities more effectively.”**

A landmark initiative emerged in 2005, which introduced a public-private partnership model. By 2009, they operated over 2,600 ambulances across ten states, using trained paramedics, GPS-enabled vehicles, and centralized dispatch centers accessible through the 108 helplines. This model reduced emergency response times, contributing to a significant decrease in mortality rates, in cases of trauma and cardiac emergencies. For instance, studies indicate that the EMS interventions reduced trauma-related fatalities by 15% to 20% in serviced areas.

In 2007, responding to the increasing incidence of road traffic accidents, the Indian government started an integrated trauma care network along national highways. By the mid-2010s, EMS infrastructure had expanded, with helplines 108 and 102 recognized, and over 17,000 ambulances deployed across 31 states and union territories. Government funding under National Rural Health Mission (NRHM).

Despite these advancements, EMS in India continues to face significant challenges, including insufficient funding, regional disparities, inadequate infrastructure, inconsistent training standards, and resource shortages. Infrastructure gaps such as maintained roads and limited hospital access in rural and remote locations further complicate timely service delivery. The availability and quality of training programs vary across states, affecting the overall effectiveness of EMS.

Regional variations remain pronounced. While some of the states in India showcase developed and effective EMS frameworks, while others, especially in northeastern and central regions, continue to experience limited coverage and resource scarcity. These disparities affect patient outcomes, underscoring the need for standardized protocols and fair resource allocation nationwide.

Looking ahead, the future of EMS in India lies in innovative solutions, including the integration of advanced technologies such as drone delivery systems for remote areas, telemedicine for real-time consultation, AI-based predictive analytics for resource allocation, and strengthened public-private partnerships. Comprehensive national policies, standardized training programs, enhanced infrastructure, and continuous investment are essential for further improving EMS capacity and effectiveness across the country, ensuring fair and high-quality Emergency Medical care for all citizens.

### **About Emergency Paramedics**

Paramedics represent a critical segment of India's healthcare workforce, distinguished by their autonomy, specialized clinical expertise, and rapid response capabilities in emergency room and prehospital settings. Their primary role centers on the assessment, stabilization, and management of acute medical and trauma emergencies, often delivered in dynamic and resource-constrained environments. Operating outside traditional hospital infrastructure, paramedics are trained to provide life-saving interventions that significantly influences patient survival and recovery outcomes.

In India, paramedics play a vital role in public health by delivering prehospital emergency care aimed at reducing morbidity and mortality associated with medical, traumatic, obstetric, and pediatric emergencies. Their clinical responsibilities encompass advanced airway management, cardiopulmonary resuscitation (CPR), defibrillation, administration of emergency pharmacological agents, hemorrhage control, stabilization of musculoskeletal injuries and disaster response. These critical interventions are frequently executed in high-stress, time-sensitive environments, demanding a high degree of clinical skill, accuracy, and quick decision-making.

Paramedics also play a vital role in early recognition and management of life-threatening conditions. Their contributions extend to the management of reinforcing their role in both emergency and preventive healthcare.

Collaboration is a cornerstone of paramedic practice in India. Paramedics work closely with emergency physicians, trauma surgeons, and other healthcare professionals to ensure continuity of care from the field to hospital settings. They are integral to disaster response teams, actively participating in mass casualty management during natural disasters, pandemics, and other large-scale emergencies. Their presence enhances the resilience of India's healthcare system, particularly in under-served and remote regions.

Professional development for paramedics in India involves structured training programs, certification, and continuous skill enhancement, aligning with global standards of emergency care. As India continues to invest in healthcare infrastructure and emergency preparedness, paramedics remain central to the national strategy for reducing preventable deaths and improving emergency medical outcomes.

### **Recognition of Title and qualification**

**The recommended title for this group of professionals stands as the ‘Paramedic’.**

Paramedics are professionals who serve as the first point of contact in emergencies, bridging the gap between the scene of an incident and definitive hospital care. After evaluating global practices and aligning with the evolving Indian healthcare framework, the recommended and standardized title for this cadre of professionals is “Paramedic.”

The designation of Paramedic carries with it international recognition, professional respect, and a clear identity. It reflects the advanced clinical training, decision-making capacity, and emergency care expertise that distinguish these practitioners from other allied health professionals. Unlike other Allied and healthcare providers, paramedics are specifically educated and trained to manage prehospital and acute emergency situations.

### **Career Advancement Scheme (CAS)**

In the academic path, career advancement scheme has been clearly laid down by NCAHP. Irrespective of the paths chosen, at entry level with Bachelors of Emergency Medical Technologist (Paramedic) degree job openings may be available, but to grow in the profession, years of experience, coupled with Masters of Emergency Care (Advanced Care Paramedic) post-graduation degrees, advanced certifications, and specialized training may provide better opportunities. Academic performance indicators as per the NCAHP recommendations, key performance indicators as per the private sector, serve as benchmarks for career progression.

As per the scope of Emergency Paramedic practice, the job sectors include:

- A. Emergency Medical Services / Emergency Response Units
- B. Independent Paramedic Practitioners
- C. Corporate Emergency Services
- D. Public Health and Disaster Management
- E. Industrial and Occupational Health
- F. Hospital Emergency Departments
- G. Academic and Educational Institutions
- H. Clinical Research and Development
- I. Tele-Emergency Health Services – Health Helplines
- J. Transformational/Translational Research

- A. **Emergency Response Units:** Paramedics are primarily employed in ambulance services, rapid response teams, and rescue units. Career paths in these services include field supervisor, operations manager, regional emergency coordinator, and director of emergency medical services.
- B. **Independent Paramedic Practitioners:** Qualified paramedics, under regulatory frameworks, may establish independent urgent care clinics, first aid training institutes, or consultancy services related to emergency preparedness and disaster response.
- C. **Corporate Emergency Services:** Paramedics work within corporate organizations providing on-site emergency medical care, occupational health services, and training staff in emergency response protocols. Career advancement may lead to senior health and safety officer positions or regional emergency health coordinator roles.
- D. **Public Health and Disaster Management:** Paramedics collaborate with governmental and non-governmental organizations (NGOs) on community health initiatives, disaster preparedness programs, epidemiological studies, and mass casualty management training.
- E. **Industrial and Occupational Health:** Paramedics conduct pre-employment health screening, periodic medical assessments, set health standards for occupational safety, manage on-site emergencies, and lead health awareness campaigns focused on occupational health and safety.
- F. **Hospital Emergency Departments:** Paramedics play a crucial role in hospital settings by managing patient inflow, providing critical care in emergency units, assisting physicians during critical procedures, and coordinating prehospital-to-hospital patient care. They may also serve as clinical educators, administrators, or departmental heads.
- G. **Academic and Educational Institutions:** In educational settings, paramedics are employed as faculty members, instructors, researchers, and administrators based on experience and academic qualifications as per regulatory guidelines. Paramedic training programs and EMS departments in academic institutions are led by experienced emergency paramedic professionals.
- H. **Clinical Research and Development:** Research opportunities for paramedics include trauma care, prehospital interventions, emergency medical technologies, disaster medicine, and clinical trials focused on improving emergency care outcomes.
- I. **Tele-Emergency Health Services:** Paramedics are involved in developing and operating digital health solutions, telemedicine platforms, and remote emergency response consultation services.
- J. **Transformational/Translational Research:** Paramedics with advanced qualifications participate in translational research, converting scientific discoveries and clinical innovations into improved practices and protocols in prehospital emergency care and disaster medicine.

### A. Career Levels, Eligibility, Experience, and Appraisals:

Sector	Career Level	Eligibility and Experience for Direct Recruitment	Eligibility and Experience for Promotion	Annual Performance Appraisal
Clinical/Public Health	Emergency Paramedic	Bachelor's degree in EMS	2 years of experience	Based on clinical KPIs
Clinical/Public Health	Senior Emergency Paramedic	Bachelor's degree in EMS + 2 years experience	5 years experience + advanced certification	Annual clinical audit and performance review
Clinical/Public Health	Paramedic Supervisor	Bachelor's degree in EMS + 5 years experience	7 years experience + leadership training	Peer and supervisor evaluation
Clinical/Public Health	Manager/Coordinator of Emergency Services	Master's degree + 8 years experience	10 years of relevant experience + managerial training	KPIs and departmental review
Industry (Professional Services/Marketing)	Health and Safety Officer	Bachelor's in EMS	3 years experience in industrial/corporate health	Performance based on safety standards compliance
Industry (Professional Services/Marketing)	Senior Health and Safety Officer	Bachelor's degree in EMS + 5 years experience	7 years experience + specialized occupational health training	Annual review of safety programs effectiveness
Industry (Professional Services/Marketing)	Regional Emergency Health Coordinator	Master's degree in EMS/Management + 8 years experience	10 years experience + advanced leadership and strategic training	Annual strategic and operational KPI review

## B. Levels for careers in Academics and Research:

Academic	Eligibility and experience requirement (on Direct recruitment)	Eligibility and experience requirement (on Promotion as per NCAHP -CAS-Career Advancement Scheme)
Tutor / Demonstrator	Bachelor's Degree or Advanced PG Diploma in Emergency Medical Technologist or equivalent	with a minimum clinical experience of 2 years
Assistant Professor	Essential: Master's Degree in Emergency Medical Technologist or Trauma Care Management in Emergency Care/ Post Graduate Program in Emergency Care / PG Diploma in Emergency Care in trauma care, or equivalent Degree with at least 50 % marks	N.A.
Associate Professor	Essential: PhD or equivalent, Master's Degree in Emergency Care/ Post Graduate Program in Emergency Care / PG Diploma in Emergency Care in trauma care	5 (Five years) of experience in teaching as Assistant professor
Professor	Essential: PhD or equivalent / Master's Degree in Emergency Care/ Post Graduate Program in Emergency Care / PG Diploma in Emergency Care with Desirable: i) Published work of high standard in peer –reviewed journals.	10 (Ten years) of experience in teaching as Associate Professor
Senior Professor	Essential: PhD or equivalent / Master's Degree in Emergency Care/ Post Graduate Program in Emergency Care / PG Diploma in Emergency Care with Desirable: i) Published work of high standard in peer –reviewed journals.	15 (Fifteen years) of experience in teaching as Professor

Academic	Eligibility and experience requirement (on Direct recruitment)	Eligibility and experience requirement (on Promotion as per NCAHP -CAS-Career Advancement Scheme)
Dean	Essential: PhD or equivalent / Master's Degree in Emergency Care/ Post Graduate Program in Emergency Care / PG Diploma in Emergency Care Desirable: Senior-most Professor shall be designated as the Principal/Dean.	(25) Twenty-Five years of Experience.

### C. Levels for careers in Research

Research	Eligibility and experience for Direct recruitment*	Eligibility and experience for promotion*
Scientist –B	Bachelors of Emergency Medical Technologist (Paramedic) or equivalent with a minimum clinical experience of 2 years	N.A.
Scientist - C/Scientist	Bachelors of Emergency Medical Technologist (Paramedic) and Masters of Advanced Care Paramedic	N.A.
Scientist -D/ Scientist	Five years of experience as Scientist-C/Scientist. /PhD or equivalent	Five years of experience as Scientist-C /Scientist
Scientist –E/ Scientist/Sr. Scientist	Five years of experience as Scientist - D/ Scientist / PhD or equivalent	Five years of experience as Scientist -D/ Scientist
Scientist –F/ Scientist/Sr. Scientist	Fifteen years of experience as Scientist D/ Scientist PhD or equivalent Scientist -F/ Scientist/ Sr. Scientist	Five years of experience as Scientist E/ Scientist/ Sr. Scientist
Scientist –G/ Research Head/ Principal Scientist	Fifteen years of experience as Scientist F	Five years of experience as Scientist F/ Scientist/ Sr. Scientist
Additional Director General	20 years of experience as Scientist G	Two years of experience as the Scientist –G/Research Head/ Principal Scientist

## Roles and Responsibilities of Paramedic (Reference: Indian Entry Level Competency Skills document as stated)

- Understand the emergency codes used in the hospital for emergency situations
- Reflect professionalism through use of appropriate language while speaking to the dispatch team
- Use communication equipment such as mobile phones, radio communication equipment and other equipment as required by the EMS provider
- Evaluate the situation of the patient(s) on the basis of the call with the dispatch centre
- Demonstrate teamwork while preparing for an emergency situation with a fellow EMT and/or a nurse
- Recognize the boundary of one's role and responsibility and seek supervision from the medical officer on duty when situations are beyond one's competence and authority
- Prepare for the emergency by practicing Body Substance Isolation (BSI).
- Prepare the ambulance with the required medical equipment and supplies as per the medical emergency. A large selection of equipment and supplies specialised for Emergency Medical Services include diagnostic kits, disposables, and patient care products. The EMT should ensure all materials, supplies, medications and other items required have been stocked in the Ambulance
- Demonstrate active listening in interactions with the dispatch team, colleagues and the medical officer
- Establish trust and rapport with colleagues
- Maintain competence within one's role and field of practice
- Promote and demonstrate good practice as an individual and as a team member at all times
- Identify and manage potential and actual risks to the quality and safety of practice
- Evaluate and reflect on the quality of one's work and make continuing improvements
- Understand basic medico-legal principles
- Function within the scope of care as defined by state, regional and local regulatory agencies

## Definition of Paramedic

“Paramedic is a specially trained, allied health professional who provides advanced emergency medical care, including life-saving interventions and patient transportation, in prehospital and emergency situations”.

According to International standard classification of Occupations (ISCO -08, Volume I, International Labour Office, Geneva, 2012, Page 26), is classified under occupations (Major Group : Health Professionals (2); Sub Major Group : Health Professionals (22); Minor Group : Paramedical Practitioners (224) ; Unit Group : Advanced care paramedic ( ISC code-2240)at Skill Level 4 typically involving the performance of tasks that require complex problem-solving, decision making and creatively based on an extensive body of theoretical and factual knowledge in a specialised field. Such skill are usually obtained as the result of study at a higher educational institution for a period of 3-6 years leading to the award of a first degree or higher qualification.

## Education of the Emergency Medical Technologist (Paramedic)

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 are designed accordingly. The curriculum is prescriptive and is designed with an aim to standardize the content across the nation. As stated above the focus of the profession is to create qualified and skill manpower in the field of Trauma and Burns care through the following levels of higher education

- Bachelors of Emergency Medical Technologist (Paramedic)
- Masters of Advanced Care Paramedic
- PhD

## Entry requirements

As per the NCAHP guidelines it is recommended that the students entering the Bachelors of Emergency Medical Technologist (Paramedic) programme at under graduate level should have completed the recognized secondary school studies as the qualification stipulated is 10+2 with sciences (Botany, Zoology, Physics and Chemistry) or equivalent from a recognized university or board-with 50% marks in Physics, Chemistry, Biology which will provide the foundation for and prepare them for higher education studies. The student should have 17 years of age as on 31st December of the admission year. Students entering the programme at post graduate level, should have completed the Bachelors in Emergency Medical Technologist or equivalent degree in a regular full time on campus mode with a minimum of 50% marks from a recognized university. Students entering the PhD program should be as per the NCAHP regulations.

Candidates who have completed diploma in emergency medical services (after completion of 10+2 with science) or its equivalent can also join the undergraduate course. They would be eligible to join in 2nd year of bachelors program if the numbers of hours are in line with the bachelor's program of first year. The total education therefore would be (2-year diploma + 3 year of undergraduate studies). The final year of the program (lateral entry) would be internship.

## Nomenclature

Nomenclature of both under graduate and postgraduate programs should be uniform across the country. The nomenclature for the undergraduate program is **"Bachelors of Emergency Medical Technologist"** whereas for a postgraduate program is **"Masters of Advanced Care Paramedic"**.

## Course Duration

It is recommended that any programme developed from this curriculum should have a minimum of the following duration to qualify as a professional course -

4-year programme (including 1 year of clinical training /internship)- Bachelor's degree level

- 2-year programme- Master's degree level
- PhD in relevant discipline (Emergency Care) should be in accordance with NCAHP regulations (Minimum standards and procedures for award of PhD degrees).

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 paramedic as a key member emergency medical services and emergency team and to enable him/her to execute assessment, management and delivery pre-hospital and emergency care services.

With the change in the disease and trauma mechanism dynamics, and multi-fold increase in the pre-hospital care services, 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 of emergency care. The post graduate students can contribute significantly in research and academics. PhD plays a significant role in the academics / research systems. The current curriculum has indicated prescriptive guidelines for the career and qualification map.

## Exit exam / Licensure exam:

There shall be a third-party exit / licensure exam at the end of the Internship (4<sup>th</sup> year) for Bachelor's program and at the end of (2<sup>nd</sup> Year) for Masters program. The exit examination, or licensure examination, serves as a requisite assessment for clinical practice eligibility. While the university may confer a degree completion certificate, it is contingent upon the successful clearance of the exit examination for clinical practice privileges within India. Additional criteria and regulations governing the exit examination are in accordance with the guidelines established by the National Commission for Allied and Health Professions (NCAHP).

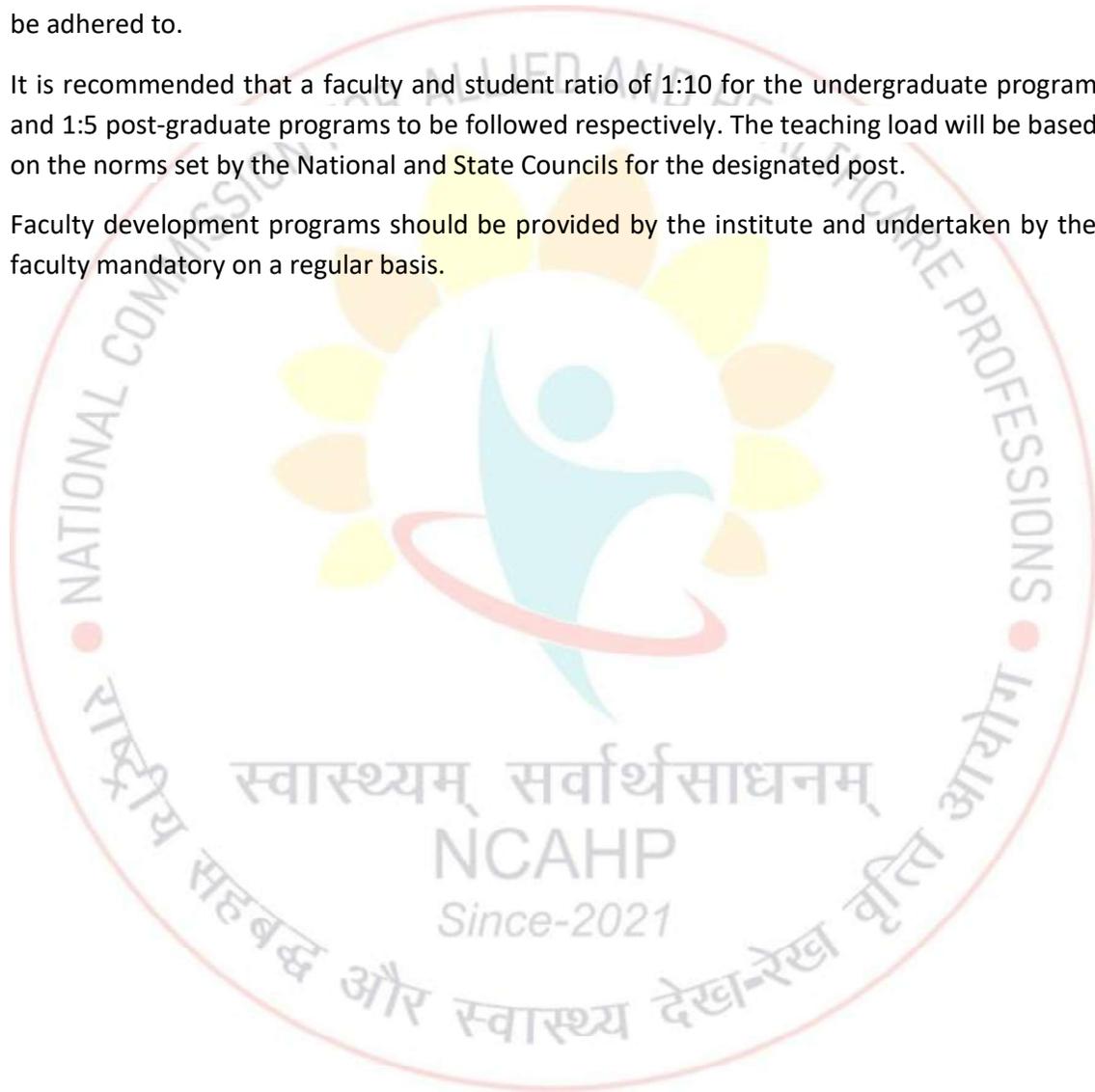
## Teaching faculty and infrastructure

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.

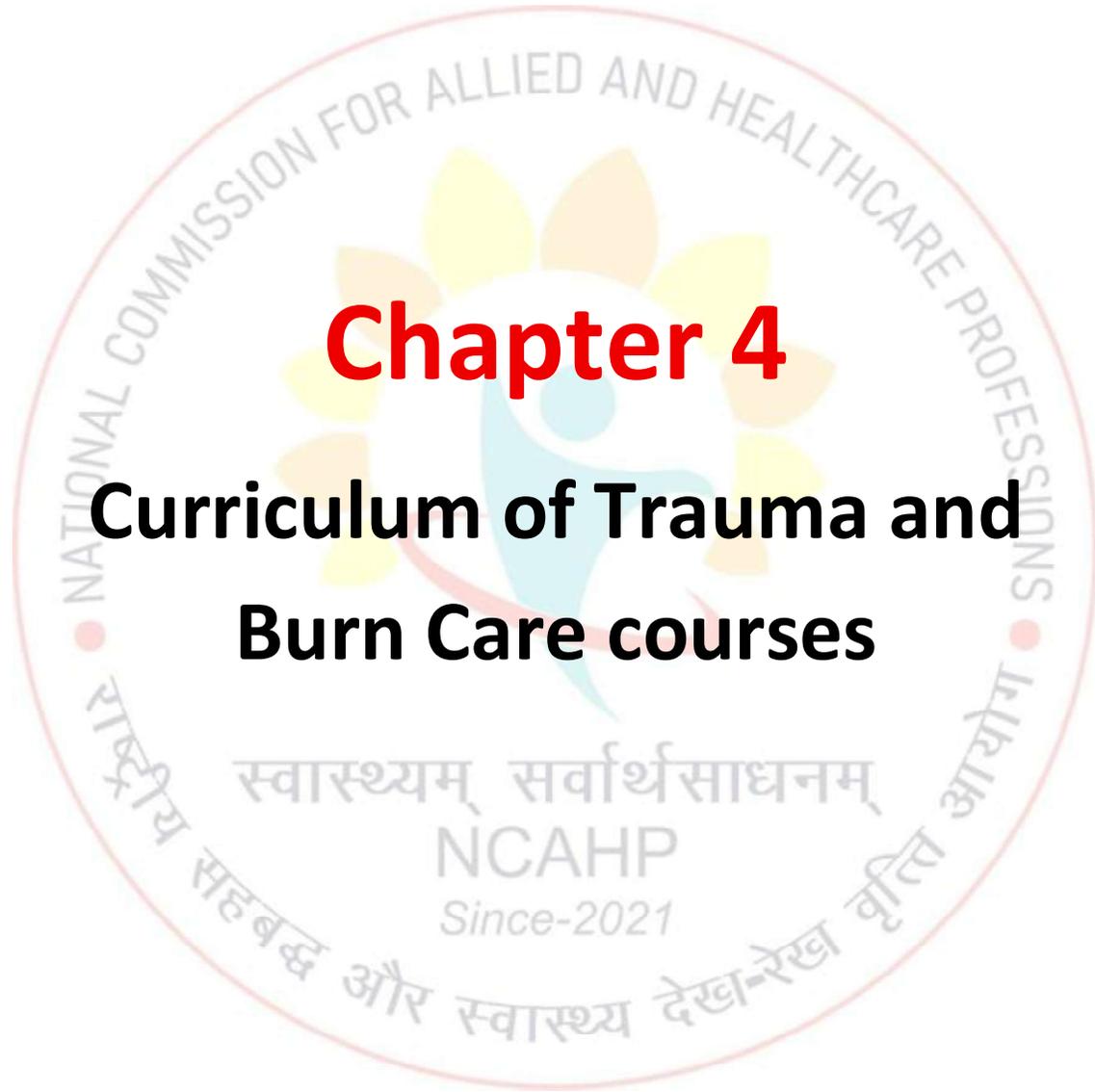
Teaching areas should facilitate different teaching methods. Where students may share didactic lectures with other disciplines large lecture theatre may be appropriate, but smaller teaching areas should also be provided for tutorial and problem/case-based learning approaches. In all venues where students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

It is recommended that a faculty and student ratio of 1:10 for the undergraduate program and 1:5 post-graduate programs to be followed respectively. The teaching load will be based on the norms set by the National and State Councils for the designated post.

Faculty development programs should be provided by the institute and undertaken by the faculty mandatory on a regular basis.







# Chapter 4

## Curriculum of Trauma and Burn Care courses

## Curriculum Background

Emergency Medical Services (EMS) represent the front line of healthcare, delivering rapid, precise, and compassionate care in life-threatening situations. The foundational philosophy of EMS emphasizes the intrinsic value of every life and the critical role timely intervention plays in patient outcomes, during the “golden hour” following emergencies. In India, EMS extends beyond mere service provision, acting as a critical bridge connecting emergency scenes to definitive medical care, especially in remote and under-served regions.

The academic development of paramedic in India is a crucial part of building a strong and responsive emergency medical service (EMS) and pre-hospital care system. Paramedics form the backbone of emergency response, bridging the critical gap between the scene of an incident and definitive hospital care. As India continues to face a rising burden of road traffic accidents, acute medical emergencies, and disaster-related incidents, the structured academic growth of the paramedic profession is essential. It is the opportunity to shape paramedic into a well-recognized healthcare profession by travelling down the academic, professional, and legislative pathways similar to the global standards.

The aims of the recommended curriculum are to produce

- To Standardize Competency-Based Education
- Technically and clinically competent
- To Strengthen Pre-hospital Emergency Care Capacity
- Research and Evidence-Based Practice
- To Align with Global Standards
- Effective members of the multidisciplinary team

All aspects of emergency medical services 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. 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. It is recommended that any program developed from this curriculum adhere to the following minimum duration to qualify as an entry-level professional in emergency care

### **A 4-year program, inclusive of a one-year internship, at the Bachelor’s degree level.**

Initially, the emphasis should be on academic content to establish a robust scientific foundation, with a later focus on the application of theory to clinical, experiential learning and reflective practice. Clinical postings should commence from the second year onwards in the Bachelor’s degree program, following a continuum from theory to practical clinical experiences throughout the program.

The aim of the four-year degree program is to foster the development of paramedic professionals as technically skilled professionals. The vision is to create a cadre of globally competent, ethically grounded, research-oriented, and patient-centered emergency care providers who will play a pivotal role in saving lives and strengthening India's healthcare system.

Given the evolving disease dynamics and increased demand for paramedic services, it is imperative to encourage well-structured postgraduate education programs. These programs aim to enhance research capacity domestically and expand the scope of clinical practice within the profession. Consequently, a Master's degree program is recommended, with a minimum duration of two years focusing on specialized fields of Emergency Care. Postgraduate students are expected to make significant contributions to research and academia.

## **Bachelor of Emergency Medical Technologist (Paramedic)**

### **Introduction:**

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

- Discuss the critical points, required components, and system elements of EMS
- Describe various types of transports the paramedic may perform, including transports to specialty centers and inter facility transports.
- Discuss the paramedic's role in working with other health care providers and public safety agencies
- Characterize the EMS system's role in prevention and public education in the community
- Describe the attributes, roles and responsibilities of the paramedic
- Perform rapid patient assessment and prioritize care using the Airway–Breathing–Circulation– Disability–Exposure (ABCDE) approach.
- Provide advanced trauma life support, including hemorrhage control, immobilization, splinting, spinal motion restriction, and burn care.
- Manage cardiac emergencies, including use of defibrillators, ECG interpretation, and cardiopulmonary resuscitation (CPR) with advanced life support.
- Describe evidence-based clinical protocols, guidelines, and standard operating procedures (SOPs) in EMS practice
- Describe how medical direction of an EMS system works and the paramedic's role in the process
- Discuss the purpose of the EMS continuous quality improvement
- Discuss the importance of medical research and its role in refining EMS practices
- Discuss evidence-based medicine and how to incorporate this concept into everyday paramedic practice

### Eligibility for admission:

1. He/she has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board in biology/Botany, Zoology physics, chemistry, Admission is done based on the NEET exam appeared candidates followed by a counselling session.

#### Eligibility criteria:

- A. Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with Physics, Chemistry, Biology/Botany, Zoology.

OR

- B. Candidates who have studied abroad and have passed the equivalent qualification as determined by the University will form the guideline to determine the eligibility and must have passed with science subjects: Physics, Chemistry, Biology up to 12th Standard level.

OR

- C. Candidates who have passed the Senior Secondary school examination of National Open School with a minimum of 5 subjects with any of the following group subjects.

- English, Physics, Chemistry, Botany, Zoology
- English, Physics, Chemistry, Biology and any other language

2. Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities will form the guideline to determine the eligibility and must have passed in the subjects: Physics, Chemistry, Biology and English up to 12th Standard level with pass marks (equivalence to) 50% in physics, chemistry, biology / botany, zoology
3. He/she has attained the age of 17 years as on 31. December of the year of admission
4. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.
  - During subsequent counselling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.
  - Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.
  - The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice.

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

Lateral entry to second year of undergraduate bachelors programme for candidates who have passed diploma in emergency medical services/emergency care programs from the Government Boards and recognized by State/Central University, fulfilling the conditions specified and these students are eligible to take admission on lateral entry system only if the related subjects have been studied at diploma level with appropriate transfer of credits.

### **Duration of the course**

The Bachelor of Emergency Medical Technologist (Paramedic) undergraduate degree program is of four years duration (3+1) including one year of compulsory internship.

Duration of the course: 4 (3+1) years or 8 (6+2) semesters.

### **Total hours – 5200 (Didactics+ Practical +Simulation education internship)**

Semesters - An academic year consists of two semesters

- Odd Semester: June/July to November/December
- Even Semester: November/December to April/May

### **Medium of instruction:**

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

### **Principal/Head of the Institute**

In an affiliated college, Principal or Head of the institute must be an Emergency Medical Services / Paramedic professional only. In a university set up, HOD must be an paramedic. Dean must belong to Allied and Healthcare professions as mentioned in the NCAHP Act.

### **Attendance:**

A candidate has to secure minimum-

- 75% attendance in theoretical
- 80% in Skills training (practical and clinical training) for qualifying to appear for the examination.

### **Assessment:**

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

## Competency Standards

Classification Units of Competency Skills at Entry level for paramedics

1. Clinical Competence:
  - Assess, diagnose, and manage emergencies
  - Life support techniques
  - Triage and transport
2. Professionalism and Ethics:
  - Medico-legal understanding
  - Ethical decision-making
3. Communication and Teamwork:
  - Patient and team communication
  - Leadership in emergency settings
4. Public Health and Preventive Care:
  - National health programs
  - Mass casualty response
5. Lifelong Learning and Research:
  - Evidence-based practice
  - Continuous development



## Bachelor of Emergency Medical Technologist (Paramedic) 4-year program

### Proposed Scheme

Year	Semester	Hours
1	1	360
	2	390
2	3	450
	4	450
3	5	450
	6	450
4	7	1250
	8	1250
<b>Total</b>		<b>5050</b>

### Credit Details:

One credit implies one hour lecture per week or two hours of laboratory/practical per week or two hours of clinics per week or two hours of Research project per week

A semester is considered to have 15 weeks.

For example, 1 credit course = 15 hours of lectures per semester

3 credits course = 45 hours of lectures per semester

1 credit course = 30 hours of practical/laboratory/Simulation per week

CL	CP	L	P
3	1	45	30



## Curriculum Outline

### First Semester

Sl. No.	Course Titles	Hours/semester		
		Lecture	Practicals	Total
<b>BEMT 101</b>	Anatomy	45	30	75
<b>BEMT102</b>	Physiology	45	30	75
<b>BEMT103</b>	Biochemistry	45	30	75
<b>BEMT104</b>	Introduction to EMS and Ambulance Operation	30	15	45
<b>BEMT105</b>	Communication Skills	30	15	45
<b>BEMT106</b>	Basics of Computers	30	15	45
<b>TOTAL</b>		<b>225</b>	<b>135</b>	<b>360</b>

### Second Semester

Sl. No.	Course Titles	Hours/semester		
		Lecture	Practicals	Total
<b>BEMT 201</b>	Pharmacology	45	30	75
<b>BEMT 202</b>	Pathology	45	30	75
<b>BEMT 203</b>	Microbiology	45	30	75
<b>BEMT 204</b>	Instrumentation of EM part-I	45	30	75
<b>BEMT 205</b>	Community Medicine	15	30	45
<b>BEMT 206</b>	Psychology	15	30	45
<b>TOTAL</b>		<b>210</b>	<b>180</b>	<b>390</b>

### Third Semester

Sl. No.	Course Titles	Hours per semester		
		Lecture	Practicals	Total
<b>BEMT 301</b>	Introduction to Patient Care and Assessment	45	30	75
<b>BEMT 302</b>	Medical Emergencies Part-1: Respiratory, Cardiovascular, Neurological, Gastrointestinal and Genitourinary	45	30	75
<b>BEMT 303</b>	Trauma Emergencies part-1: Introduction to Trauma, Hemorrhage and Shock, Head and Facial Trauma, Thoracic and Abdominal Trauma.	45	30	75
<b>BEMT 304</b>	Instrumentation Part-2	45	30	75
<b>BEMT 305</b>	Indian culture, heritage, yoga & meditation	30	-	30
<b>BEMT 306</b>	Soft skills and Clinical Communication Skills	30	-	30
	Clinical Rotation 1		90	90
<b>TOTAL</b>		<b>240</b>	<b>210</b>	<b>450</b>



#### Fourth Semester

Sl. No.	Course Titles	Hours per semester		
		Lecture	Practicals	Total
<b>BEMT 401</b>	Medical Emergencies part-2: Pulmonology, Endocrine, Hematology, Immunological, Oncology, Psychiatry	45	30	75
<b>BEMT 402</b>	Trauma-2: Musculoskeletal Trauma, Spinal Trauma and Geriatric Trauma	45	30	75
<b>BEMT 403</b>	Burns	45	30	75
<b>BEMT 404</b>	Surgical Emergencies	45	30	75
<b>BEMT 405</b>	Introduction and Application of Artificial Intelligence in healthcare	30	-	30
<b>BEMT 406</b>	Healthcare management: Personality development, Leadership, Human Rights.	30	-	30
	Clinical Rotation 2		90	90
<b>TOTAL</b>		<b>240</b>	<b>210</b>	<b>450</b>

#### Fifth Semester

Sl. No.	Course Titles	Hours per semester		
		Lecture	Practicals	Total
<b>BEMT 501</b>	Toxicology and Environmental Emergencies	45	30	75
<b>BEMT 502</b>	Gynecological and Obstetric Emergencies	45	30	75
<b>BEMT 503</b>	Neonatology and Pediatrics	45	30	75
<b>BEMT 504</b>	Clinical Pharmacology – Emergency Medications	45	30	75
<b>BEMT 505</b>	Basics of Radiology & Imaging Interpretation	30	15	45
<b>BEMT 506</b>	Telemedicine	30	15	45
	Clinical Rotation 3		90	90
<b>TOTAL</b>		<b>240</b>	<b>210</b>	<b>450</b>

## Sixth Semester

Sl. No.	Course Titles	Hours per semester		
		Lecture	Practicals	Total
<b>BEMT 601</b>	Disaster and MCI Management	45	30	75
<b>BEMT 602</b>	Research Methodology and Bio statistics	45	-	45
<b>BEMT 603</b>	Intensive care concepts and management	60	-	60
<b>BEMT 604</b>	Intensive care concepts and management- Practical	-	90	90
<b>BEMT 605</b>	Emergency Clinical Procedures	-	60	60
<b>BEMT 606</b>	Business entrepreneurship development	30	-	30
	Clinical Rotation 4		90	90
<b>TOTAL</b>		<b>180</b>	<b>270</b>	<b>450</b>

## Seventh and Eighth Semester

Sl. No.	Course Titles	Hours per semester	
		Clinical Rotation	Total
<b>BEMT 701</b>	Internship	1250	1250
<b>BEMT 801</b>	Internship	1250	1250
	<b>Total</b>		<b>2500</b>

- An appropriate nominal amount shall be paid as stipend for the intern students. This should be revised periodically.

## First Semester

### 1. Subject: General Anatomy

CL	CP	L	P
3	1	45	30

#### Instructors In charge:

MD Anatomy, M Sc Anatomy or Masters of Advance Care Paramedic or Equivalent with experience in handling anatomy.

**Course Description:** General anatomy deals with the entire human anatomy with emphasis on different tissues, blood vessels, glands, skeletal and the entire central nervous system in particular.

**Objectives:** At the end of the semester, the student should be able to:

1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.
2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions.
3. Identify the anatomical structure in the dissected specimen.
4. Learn to correlate anatomical structures with relevant clinical conditions



**Course Plan:**

Unit	Topic / Module	Hours
1	<p><b>Organization of the Human Body</b></p> <ul style="list-style-type: none"> <li>• Introduction to the human body</li> <li>• Definition and subdivisions of anatomy</li> <li>• Anatomical position and terminology</li> <li>• Regions and Systems of the body</li> <li>• Cavities of the body and their contents</li> <li>• Levels of organization of the body</li> </ul> <p><b>Cell</b></p> <ul style="list-style-type: none"> <li>• Definition of a cell, shapes and sizes of cells</li> <li>• Parts of a cell</li> <li>• Cell membranes cytoplasm, subcellular organelles and their main functions</li> </ul> <p><b>Cell Division</b></p> <ul style="list-style-type: none"> <li>• Definition and main events that occur in different stages of mitosis and meiosis.</li> </ul> <p><b>Tissues</b></p> <ul style="list-style-type: none"> <li>• Tissues of the body</li> <li>• Definition and types of basic tissues</li> <li>• Characteristics, functions and locations of different types of tissues</li> </ul>	7 Hours
2	<p><b>Systems of Support and Movement</b></p> <p><b>1. Skeletal system</b></p> <p><b>Skeleton</b></p> <ul style="list-style-type: none"> <li>• Definition, axial and appendicular skeleton with names and number of bones, Types of bones.</li> <li>• Parts of bones. Functions of bones. Name location and general features of the bones of the body.</li> </ul> <p><b>Joints</b></p> <ul style="list-style-type: none"> <li>• Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.</li> </ul> <p><b>2. Muscular system</b></p> <ul style="list-style-type: none"> <li>• Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastronemius and diaphragm.</li> </ul>	9 Hours

Unit	Topic / Module	Hours
3	<p><b>Control Systems of the Body</b></p> <p><b>1. Nervous system</b> Sub-divisions of the nervous system</p> <p><b>Spinal cord</b></p> <ul style="list-style-type: none"> <li>• Location, extent, spinal segments, external features and internal structure.</li> </ul> <p><b>Brain</b></p> <ul style="list-style-type: none"> <li>• Sub-divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord.</li> </ul> <p><b>Cranial nerves</b></p> <ul style="list-style-type: none"> <li>• Name, number, location and general distribution.</li> <li>• Spinal nerves</li> <li>• Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.</li> </ul> <p><b>Autonomic Nervous system</b></p> <ul style="list-style-type: none"> <li>• Definition and functions</li> </ul> <p><b>2. Sense organs</b></p> <ul style="list-style-type: none"> <li>• Location and features of the nose, tongue, eye, ear and skin</li> </ul> <p><b>3. Endocrine system</b> Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.</p>	15 Hours
4	<p><b>Maintenance of the Human Body</b></p> <p><b>1. Cardio-vascular system</b></p> <ul style="list-style-type: none"> <li>• Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries</li> <li>• Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart. Blood supply of the heart.</li> </ul> <p><b>The systemic arteries and veins.</b></p> <ul style="list-style-type: none"> <li>• Name, location, branches and main-distribution of principal arteries and veins.</li> </ul>	14 Hours

Unit	Topic / Module	Hours
	<b>2. Lymphatic system</b> <ul style="list-style-type: none"> <li>Lymph, lymphatic vessels, name, location and features of the lymphatic organs.</li> </ul> <b>3. Respiratory system</b> <ul style="list-style-type: none"> <li>Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.</li> </ul>	
5	<b>1. Digestive system</b> <ul style="list-style-type: none"> <li>Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.</li> </ul> <b>2. Urinary system</b> <ul style="list-style-type: none"> <li>Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra.</li> </ul>	9 Hours
6	<b>Reproductive system</b> <ul style="list-style-type: none"> <li>Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.</li> </ul>	6 Hours
	<b>Practical</b> <ul style="list-style-type: none"> <li>Bones, GIT, Respiratory, Cardiovascular, Excretory, Neuro-brain and Spinal cord, Male &amp; Female reproductive</li> <li>Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.</li> <li>Demonstration of dissected specimens</li> </ul>	30 Hours
	<b>Total Hours</b>	<b>75 Hours</b>

**Recommended books:**

- Ross and Wilson: Anatomy and Physiology in health and illness
- B D Chaurasia: General human anatomy

**References:**

- B D Chaurasia: Regional Anatomy. Vol I, II, III
- Richard S. Snell: Clinical Anatomy

**Online reference:**

- <http://study.com/academy/course/anatomy-physiology-course.html>
- <https://oli.cmu.edu/jcourse/lms/students/syllabus.do?section=434867c180020ca600dec7797edc76be>

## 2. Subject: Physiology

CL	CP	L	P
3	1	45	30

### Instructors In charge:

MD Physiology, M Sc Physiology or Masters of Advanced Care Paramedic or Equivalent with experience in handling physiology

**Course Description:** General physiology deals with the entire human anatomy with emphasis on different organ systems, their physiological functions with special emphasis on blood and neurophysiology

**Objectives:** At the end of the semester, the student should be able to:

1. Comprehend basic terminologies used in the field of Human Physiology
2. Define and describe basic Physiological Processes governing the normal functioning of the human body.
3. Apply this knowledge in their Allied Health practice

Unit	Topic/Module	Hours
1	<b>General Physiology:</b> <ul style="list-style-type: none"> <li>• Structure and function of the cell</li> <li>• Transport mechanisms across cell membranes</li> <li>• Homeostasis and feedback mechanisms</li> <li>• Introduction to body fluid compartments</li> </ul>	3 hours
2	<b>Blood and Body Fluids:</b> <ul style="list-style-type: none"> <li>• Composition and functions of blood</li> <li>• Haematopoiesis and RBC lifecycle</li> <li>• Haemoglobin and anaemia</li> <li>• WBC types and immunity basics</li> <li>• Platelets and haemostasis</li> <li>• Blood groups and transfusion</li> <li>• Plasma proteins</li> <li>• Clinical correlation: Haemorrhage, shock, blood loss in trauma</li> </ul>	6 Hours

Unit	Topic/Module	Hours
3	<b>Nerve and Muscle Physiology:</b> <ul style="list-style-type: none"> <li>• Resting membrane potential and action potential</li> <li>• Nerve structure, classification of nerve fibres, Impulse formation and conduction.</li> <li>• Neuromuscular junction.</li> <li>• Skeletal, cardiac, and smooth muscle physiology.</li> </ul>	6 Hours
4	<b>Cardiovascular System:</b> <ul style="list-style-type: none"> <li>• Structure, conduction system, innervation of the heart and properties of cardiac muscle.</li> <li>• Cardiac cycle, heart sounds, ECG</li> <li>• Heart rate, cardiac output,</li> <li>• Blood pressure- Definition, measurement, factors maintaining B.P, regulation of blood pressure</li> <li>• Circulatory shock – types and management</li> <li>• Vascular system and microcirculation</li> <li>• Clinical correlation: Hypovolemia, haemorrhagic shock, cardiac arrest</li> </ul>	10 Hours
5	<b>Respiratory System:</b> <ul style="list-style-type: none"> <li>• Physiological anatomy of upper and lower respiratory tract.</li> <li>• Mechanics of breathing</li> <li>• Lung volumes and capacities: definitions, normal values intra pulmonary and intra pleural pressures, surfactant.</li> <li>• Gas exchange and transport</li> <li>• Regulation of respiration</li> <li>• Hypoxia, cyanosis, and respiratory failure</li> <li>• Clinical correlation: Airway obstruction, Ventilatory support</li> </ul>	10 Hours
6	<b>Renal and Electrolyte Physiology:</b> <ul style="list-style-type: none"> <li>• Structure of nephron and its blood supply</li> <li>• Formation of urine,</li> <li>• Fluid and electrolyte balance</li> <li>• Acid-base regulation</li> <li>• Clinical correlation: Fluid loss, dehydration, acidosis in trauma</li> </ul>	6 Hours

Unit	Topic/Module	Hours
7	<b>Gastrointestinal Physiology:</b> <ul style="list-style-type: none"> <li>• Movements and secretions of GIT</li> <li>• Salivary glands – secretions, functions, nerve supply regulation.</li> <li>• Gastric glands - secretions, functions, nerve supply regulation.</li> <li>• Pancreatic gland - secretions, functions, nerve supply regulation.</li> <li>• Liver, Functions of bile</li> <li>• Small intestine and large intestine.</li> <li>• Deglutition, vomiting</li> <li>• Clinical correlation: Stress ulcers, enteral feeding in trauma care</li> </ul>	4 Hours
8	<b>Endocrine Physiology:</b> <ul style="list-style-type: none"> <li>• Hypothalamus - hypophyseal inter relationship</li> <li>• Pituitary hormones- functions</li> <li>• Thyroid hormones functions, biosynthesis</li> <li>• Parathyroid hormones -tetany</li> <li>• Insulin glucagon actions. Diabetes mellitus</li> <li>• Stress response – role of cortisol and catecholamine's</li> <li>• Clinical correlation: Endocrine response to trauma and surgery</li> </ul>	3 Hours
9	<b>Reproductive System:</b> <ul style="list-style-type: none"> <li>• Male reproductive organs- spermatogenesis and testosterone actions</li> <li>• Female reproductive organs – Oogenesis and oestrogen, progesterone functions.</li> <li>• Menstrual cycle</li> <li>• Pregnancy and lactation basics</li> <li>• Contraception</li> <li>• Clinical correlation: Considerations in trauma in women</li> </ul>	2 Hours

Unit	Topic/Module	Hours
10	<b>Central Nervous System and Special Senses:</b> <ul style="list-style-type: none"> <li>• Structure and functions of brain, properties of neurons.</li> <li>• Structure and functions of spinal cord, spinal cord – pathways.</li> <li>• Autonomic nervous system</li> <li>• Pain physiology and analgesia</li> <li>• Functions of brain stem, thalamus, basal ganglia, cerebellum, cortex and reticular formation.</li> <li>• Cerebrospinal fluid.</li> <li>• Thermoregulation</li> <li>• Clinical correlation: Head injury, spinal shock, pain management</li> </ul>	10 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<b>Practical Physiology:</b> <ul style="list-style-type: none"> <li>• Measurement of vital signs: pulse, BP, respiratory rate</li> <li>• ECG recording and interpretation</li> <li>• Haemoglobin estimation, blood grouping, clotting time</li> <li>• Cased based learning (charts): Cardiovascular system, Respiratory system, sensory and motor system</li> <li>• Test of vision and hearing</li> <li>• Examination of effects of exercise on blood pressure.</li> <li>• Case-based learning: shock, trauma resuscitation parameters</li> </ul>	30 Hours
	<b>Total Hours</b>	<b>75 Hours</b>

**Reference books:**

- Guyton and Hall: Textbook of Medical Physiology
- Essentials of Medical Physiology (Sembulingam & Prema Sembulingam, 8<sup>th</sup> edition)
- A C Guyton: Text book of Medical Physiology, 8th edition, Saunders company, Japan,
- G J Tortora, B Derrickson: Principles of anatomy & physiology, 11th edition, Harper & Row Publishers, New York

**Online Resources material:**

- [https://onlinecourses.nptel.ac.in/noc25\\_bt22/preview](https://onlinecourses.nptel.ac.in/noc25_bt22/preview)

### 3. Subject: Biochemistry

CL	CP	L	P
3	1	45	30

**Instructors in charge:** Ph.D. or MD in biochemistry or Masters of Advance Care Paramedic or Equivalent with experience in handling Biochemistry.

**Course Description:** Biochemistry deals with the biochemical nature of carbohydrates, proteins, minerals, vitamins, lipids etc. A detailed study of these, emphasizing on their chemical composition and their role in metabolism is the required aim of this course. To gain in-depth knowledge on biomolecules, nutrients and in the basic concept of molecular biology.

**Objectives:** At the end of the semester, the student should be able to:

- To have a knowledge about the chemistry and metabolism of various macromolecules Carbohydrates, Proteins and lipids.
- To learn about enzymes, vitamins, minerals and nutrition.
- To know the structure and function of Hemoglobin and Nucleic acids.
- To learn about the organ function tests like liver function test, thyroid function test and Renal function tests.
- To have a knowledge about the Molecular biology and its techniques

#### Course Plan

UNIT	Topic/Module	Hours
1	<p>Carbohydrate Chemistry – Classification of carbohydrates and their biological importance, Reducing property of sugars.</p> <p>Metabolism of Carbohydrate – Digestion and absorption of carbohydrates, Steps of Glycolysis &amp; energetics, steps of TCA cycle &amp; energetics, significance of HMP shunt pathway, definition and steps of Gluconeogenesis, Galactose metabolism, regulation of blood glucose, glucose profile, hypoglycaemia &amp; hyperglycaemia, Galactosemia and Diabetes mellitus.</p> <p>[*NOTE: Included topics: Regulation of blood glucose, Glucose profile and hypoglycemia. Excluded topics: Steps of glycogen synthesis and breakdown and Bioenergetics – importance of ATP &amp; outline of respiratory chain]</p>	10 Hours

UNIT	Topic/Module	Hours
2	<p><b>Lipids Chemistry</b></p> <ul style="list-style-type: none"> <li>• Classification of lipids, essential fatty acids, functions of cholesterol &amp; triglycerides, Phospholipids</li> <li>• Types and their functions.</li> </ul> <p><b>Metabolism of Lipids:</b>  Digestion and absorption of lipids, steps of <math>\beta</math> oxidation of fatty acids, normal value &amp; clinical significance of cholesterol, Ketone bodies &amp; diabetic ketoacidosis, types and functions of lipoprotein, lipid profile, hypercholesterolemia and atherosclerosis.</p> <p>[*NOTE: Included topics: Normal values &amp; clinical significance of cholesterol, ketone bodies &amp; diabetic ketoacidosis and Atherosclerosis. Hemoglobin – Structure and function of Hemoglobin]</p>	9 Hours
3	<p><b>Proteins Chemistry</b>  Classification of amino acids, plasma proteins, immunoglobulins.</p> <p><b>Metabolism of Proteins:</b>  Digestion and absorption of proteins, transamination, deamination, steps of urea cycle, Phenylketonuria, Alkaptonuria, trans methylation, products derived from Glycine and tyrosine. Techniques: Electrophoresis and Chromatography.</p> <p><b>Nucleic acids:</b>  Structure and function of DNA &amp; RNA, types of RNA. Outline of Uric acid formation and gout.</p> <p><b>Hemoglobin:</b>  Structure and function of haemoglobin &amp; hemoglobinopathies – Sickle cell anemia &amp; Thalassemia.</p> <p>[*NOTE: Included topics: Hemoglobin – Structure and function of haemoglobin &amp; hemoglobinopathies – Sickle cell anemia &amp; Thalassemia, outline of uric acid formation &amp; Gout and Techniques – Electrophoresis &amp; Chromatography. Excluded topics: Structure of proteins]</p>	13 Hours

UNIT	Topic/Module	Hours
4	<p><b>Enzymes:</b> Definition, classification, coenzymes, factors affecting enzyme activity. Isoenzymes, clinically importance of enzymes.</p> <p><b>Function Tests:</b> Liver function test, Renal function tests and Thyroid function tests.</p> <p><b>Vitamins:</b> Classification, Fat soluble vitamin: Functions, source, deficiency manifestations of vitamin A, D, E and K. Functions and deficiency manifestations of vitamin C, Co-enzymic forms and deficiency manifestations of B-complex vitamins.</p> <p><b>[*NOTE:</b> Included topics: Thyroid function tests]</p>	11 Hours
5	<p><b>Nutrition:</b> Basal Metabolic Rate (BMR), Specific Dynamic Action (SDA), Glycemic index, Dietary fibre, Balanced diet, Protein Energy Malnutrition (PEM).</p> <p><b>Minerals:</b> Calcium, Phosphorous, Iron, Iodine, Copper, Fluoride, Selenium &amp; Zinc.</p> <p>Electrolytes, Outline of pH homeostasis and acid base balance.</p> <p><b>[*NOTE:</b> <u>Included topics:</u> Minerals – copper, fluoride, selenium &amp; zinc and electrolyte, Outline of pH homeostasis and acid base balance.]</p>	7 Hours
6	<p><b>Molecular biology and Techniques:</b> Outline of DNA replication, mutation, and genetic code. Outline of Molecular techniques and applications including ELISA, PCR, Blotting, RIA, colorimetry &amp; Spectrophotometry.</p> <p><b>[*NOTE:</b> Included topics: Molecular biology and Techniques.]</p>	6 Hours

UNIT	Topic/Module	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Charts and OSPE</li> <li>Glucometer &amp; pH meter</li> <li>Spotters – Glassware/ Lab Instruments</li> </ul>	30 Hours
	<b>Total Hours</b>	<b>75 Hours</b>

**Text Books Recommended:**

- Concise text book of Biochemistry for Paramedical students by DM Vasudevan, Sreekumari S, Kannan Vaidyanathan.
- Essentials of Biochemistry by U. Sathyanarayana.

**Reference books:**

- Textbook of Biochemistry for paramedical students by Dr. P. Ramamoorthy
- Harper’s Illustrated Biochemistry – 30th edition

**4. Introduction to EMS and Ambulance Operations**

CL	CP	L	P
1	1	15	30

**Instructors in charge:** Bachelors / Post Graduate Program in Emergency Care or Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description:** This introduces students to the principles and practices of Emergency Medical Services (EMS) and ambulance operations. It provides a comprehensive overview of pre-hospital emergency care systems, focusing on the roles, responsibilities, and coordination of EMS personnel within the healthcare delivery system.

The course emphasizes the operational aspects of ambulance services, including dispatch systems, vehicle types and equipment, response protocols, safety practices, legal and ethical considerations, and communication techniques

**Objectives:** At the end of the semester, the student should be able to:

- Understand the structure and scope of Emergency Medical Services (EMS)
- Recognize the roles and responsibilities of EMS personnel
- Demonstrate knowledge of ambulance operations and types
- Explain EMS communication systems
- Understand legal and ethical principles in EMS operations
- Describe safety protocols and infection control in pre-hospital care
- Demonstrate the principles of ambulance driving and patient transport

Unit	Topic	Hours
1	<p><b>Introduction to Emergency Medical Services</b></p> <p>Define Emergency Medical Services (EMS) systems.</p> <ul style="list-style-type: none"> <li>• Differentiate the roles and responsibilities of the EMS-Professional from other pre-hospital care providers.</li> <li>• Describe the roles and responsibilities related to personal safety.</li> <li>• Discuss the roles and responsibilities of the EMS-Professional towards the safety of the crew, the patient and bystanders.</li> <li>• Define quality improvement and discuss the EMS-Professional's role in the process.</li> <li>• Define medical direction and discuss the EMS-Professional's role in the process.</li> <li>• State the specific statutes and regulations in your state regarding the EMS system.</li> <li>• Assess areas of personal attitude and conduct of the EMS- Professional.</li> <li>• Characterize the various methods used to access the EMS system in your community.</li> </ul>	<p>2 hours Theory</p> <p>5 hour Practical</p>
2	<p><b>Workplace Safety and Wellness</b></p> <ul style="list-style-type: none"> <li>• Provider Safety and well being</li> <li>• Standard safety precaution</li> <li>• Personal protective equipment</li> <li>• Stress management understanding and dealing with death and dying</li> <li>• Prevention of response related injuries</li> <li>• Prevention of work related injuries</li> <li>• Lifting and moving patients</li> <li>• Disease transmission</li> <li>• Wellness principles</li> </ul>	<p>2 hours Theory</p> <p>4 hour Practical</p>

Unit	Topic	Hours
3	<b>Public Health</b> <ul style="list-style-type: none"> <li>Define Public health and its role in the health care system</li> <li>Define intentional and unintentional injuries</li> <li>Discuss the detrimental effects of injuries as related to public health</li> <li>Discuss Pediatric injuries and risk factors for them</li> <li>Discuss the detrimental efforts of chronic and acute illness as related to public health</li> <li>Explain the concept of years of potential life lost</li> <li>Explain the relevance of a teachable moment in EMS</li> <li>Discuss the principles of injury prevention</li> <li>List the major public health laws, regulations and guidelines</li> <li>Explain the paramedics unique role in promoting public health both in terms of illness and injury</li> <li>Define primary and secondary prevention</li> <li>Define morbidity and mortality</li> <li>Discuss the concept of injury surveillance and how it relates to EMS</li> <li>Explain the Haddon matrix and how it can be used in the understanding and prevention of injury</li> <li>List ways a paramedic can promote injury prevention in the community</li> <li>Describe the steps involved in organizing a community prevention programme.</li> </ul>	3 hours Theory  5 hour Practical
4	<b>Medical, legal and ethical issues.</b>	2 hours Theory 4 hour Practical
5	<b>Ambulance operations</b>	4 hours Theory 6 hour Practical
6	<b>Lifting and Moving Patients</b>	2 hours Theory 6 hour Practical
<b>Total Hours</b>		<b>45 Hours</b>

### Text Books:

- Emergency Care and Transportation of the Sick and Injured
- Author: American Academy of Orthopaedic Surgeons (AAOS) Publisher: Jones & Bartlett Learning Edition: 12th or latest
- Prehospital Emergency Care  
Authors: Joseph J. Mistovich, Keith J. Karren Publisher: Pearson Edition: 11th or latest
- Focus on prehospital patient care along with EMS roles and operational aspects.  
Principles of EMS Systems Authors: American College of Emergency Physicians  
Publisher: Jones & Bartlett

### Reference Books:

- Mosby's Paramedic Textbook Author: Mick J. Sanders
- Fundamentals of Emergency Care Author: Richard Beebe
- Paramedic: Anatomy and Physiology (for understanding transport physiology) Author: American Academy of Orthopedic Surgeons (AAOS)

### Online Resources:

- U.S. National Highway Traffic Safety Administration (NHTSA) – EMS Resources  
<https://www.ems.gov>
- National Association of Emergency Medical Technicians (NAEMT)  
<https://www.naemt.org>
- Open Educational Resources (OER)

## 5. Fundamentals of English

CL	CP	L	P
2	-	30	-

**Instructors in charge:** Masters in the field of communication preferable or Equivalent with experience.

**Course Description:** This course deals with essential functional English competency aspects and nuances of the communication skills essential to function effectively in academic and clinical setup for the health care professionals.

**Objectives:** At the end of the semester, the student should be able to:

- This course trains the students in oral presentations, expository writing, logical organization and structural support.
- Exhibit respectful attitude and verbal and non-verbal behaviours during patient interactions.
- By acquiring skills in the use of communication techniques the students will be able to express better, grow personally, professionally, develop poise and confidence.

Unit	Topic	Hours
1	<b>Aspects of Communication</b> <ul style="list-style-type: none"> <li>• Importance of communication</li> <li>• Communication Process</li> <li>• Verbal and Non Verbal Communication</li> <li>• Communication of Barriers</li> </ul>	3 Hours
2	<b>Vocabulary</b> <ul style="list-style-type: none"> <li>• Word formation – prefixes and suffixes</li> <li>• Medical terminology</li> <li>• Words often misused or confused</li> <li>• Medical idioms, proverbs &amp; Phrasal</li> <li>• Phrasal Verbs</li> <li>• Medical Prefixes, Suffixes and roots</li> <li>• Medical Terminology – lay terms</li> </ul>	6 Hours
3	<b>Writing Skills</b> <ul style="list-style-type: none"> <li>• Letter writing - permission, leave and Other official letters</li> <li>• Note making methods</li> <li>• Paragraph Writing</li> <li>• Introduction to Clinical case report Writing</li> <li>• Developing a survey Questionnaire on health aspects</li> </ul>	6 Hours
4	<b>Speaking Skills</b> <ul style="list-style-type: none"> <li>• Day to day Conversation</li> <li>• Clinical Communication-Carry out patient-centered communication</li> <li>• Building initial rapport with Patient</li> <li>• Nonverbal communication during clinical interactions</li> <li>• Gathering Health information</li> <li>• Clarify and restate information to confirm details</li> <li>• Expressing empathy</li> <li>• Express respect</li> <li>• Active listening and Paraphrasing.</li> </ul>	8 Hours
5	<b>Listening Skills</b> <ul style="list-style-type: none"> <li>• Active listening: Importance, types and strategies</li> <li>• Conversations between health personnel</li> </ul>	3 Hours
6	<b>Reading Skills</b> <ul style="list-style-type: none"> <li>• Passage from TOEFL /OET</li> <li>• Reading comprehending passages from Case Reports medical English articles/ manuals of medical equipments.</li> </ul>	4 Hours

Unit	Topic	Hours
	<b>Practical:</b> <ul style="list-style-type: none"> <li>• Professional speaking <ul style="list-style-type: none"> <li>• Audience Analysis</li> <li>• Organizing a speech</li> <li>• Delivering a speech: Presentation Strategies</li> <li>• Interview Techniques</li> <li>• Group Discussion</li> </ul> </li> <li>• Professional writing <ul style="list-style-type: none"> <li>• Trans-coding – from verbal to visual &amp; from visual to verbal</li> <li>• Editing, Proof reading, Referencing</li> <li>• Proposals</li> <li>• User manual and Product description</li> <li>• Reports – feasibility, market survey, project</li> <li>• Conference paper/journal article writing in IMRAD Format</li> <li>• Memos and E-mails</li> <li>• Advertisement Writing</li> </ul> </li> <li>• Scenarios Practice (Role play) <ul style="list-style-type: none"> <li>• As Paramedic</li> <li>• As Patient</li> <li>• As Parent/ attendant</li> </ul> </li> </ul>	
	<b>Total</b>	<b>30 Hours</b>

**References:**

Books for General English Books

- Practical English Usage, Michael Swan
- Speak in English, Lakshminarayanan.K. R
- Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata Mc Graw – Hill Publishing Company Limited, New Delhi.

Books for Clinical Communication:

- Skills for Communicating with Patients Jonathan Silverman Suzanne Kurtz Juliet Draper
- Cambridge English for Nursing, Virginia Allum and Patricia McGarr.
- Career English for Nurses by Selva Rose

## 6. Basic Computers and Information Sciences

CL	CP	L	P
2	-	30	-

**Instructors in charge:** Masters in the field of computer science preferable or Equivalent with experience.

**Course Description:** This course introduces foundational concepts in computers and information sciences, including basic hardware, software, and digital literacy. Students will learn essential skills in MS office, internet navigation, Artificial Intelligence and file management. Emphasis is placed on understanding information systems, Pre-hospital care and medical records. This course builds confidence in using technology effectively.

**Objectives:** At the end of the semester, the student should be able to:

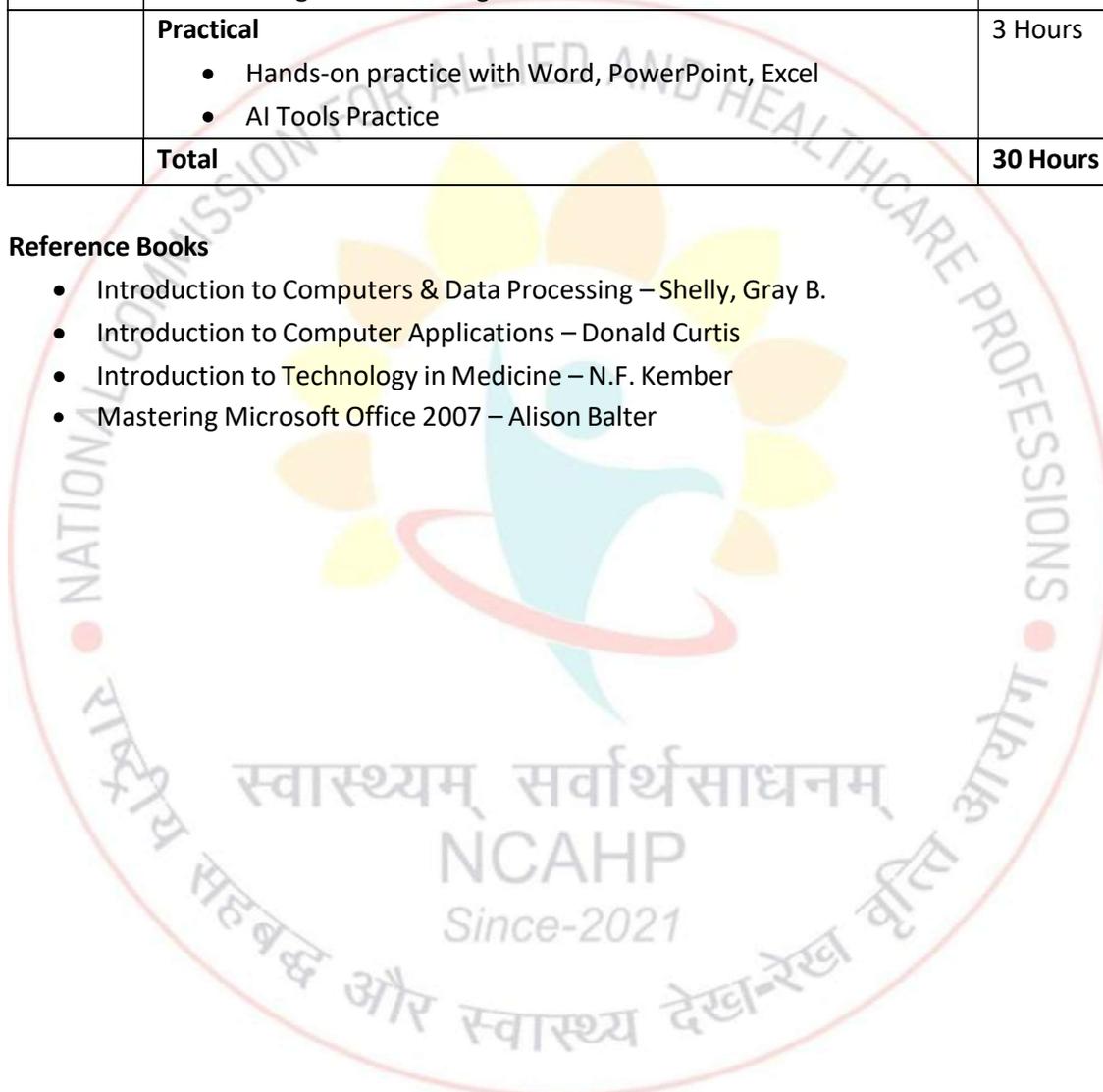
- To introduce basic concepts of computers and their applications.
- To familiarize students with computer hardware, software, and operating systems.
- To enable students to create and manage basic documents, presentations, and spreadsheets.
- To explore AI tools for documentation and productivity enhancement

Unit	Topic	Hours
1	<b>Introduction to Computers</b> <ul style="list-style-type: none"> <li>• Basics of computers, components &amp; tools</li> <li>• Calculator, Notepad, Character Map</li> <li>• Web browsers, Device Manager, Control Panel</li> <li>• Basic DOS commands</li> </ul>	4 Hours
2	<b>Hardware &amp; Software</b> <ul style="list-style-type: none"> <li>• Hardware and peripheral devices</li> <li>• Types of software</li> <li>• Operating Systems &amp; Application Software</li> <li>• Input/output devices, Storage devices, Networks</li> <li>• Email &amp; Internet</li> </ul>	5 Hours
3	<b>MS Word &amp; PowerPoint</b> <ul style="list-style-type: none"> <li>• MS Word: Home, Edit, Page Layout Tools, Proofing, Mail Merge</li> <li>• MS PowerPoint: Slide design, formatting, SmartArt, Images, Slide Animation</li> </ul>	8 Hours

Unit	Topic	Hours
4	<b>Microsoft Excel</b> <ul style="list-style-type: none"> <li>Basics of Excel &amp; functions</li> <li>Data validation &amp; conditional formatting</li> <li>Charts, Protecting sheets, Page setup</li> </ul>	7 Hours
5	<b>AI Tools</b> <ul style="list-style-type: none"> <li>ChatGPT, Copilot, Gemini</li> <li>Google Docs &amp; Google Sheets</li> </ul>	3 Hours
	<b>Practical</b> <ul style="list-style-type: none"> <li>Hands-on practice with Word, PowerPoint, Excel</li> <li>AI Tools Practice</li> </ul>	3 Hours
	<b>Total</b>	<b>30 Hours</b>

#### Reference Books

- Introduction to Computers & Data Processing – Shelly, Gray B.
- Introduction to Computer Applications – Donald Curtis
- Introduction to Technology in Medicine – N.F. Kember
- Mastering Microsoft Office 2007 – Alison Balter



## Second Semester

### 1. Subject: Microbiology

CL	CP	L	P
3	1	45	30

**Instructors in charge:** MD Microbiology / PhD Microbiology or M.Sc. Microbiology or Equivalent with experience.

**Course Description:** This course provides a comprehensive introduction to microbiology, covering microorganisms, infection control, immunology, and characteristics of bacteria, viruses, fungi, and parasites

**Objectives:** At the end of the semester, the student should be able to:

- Explain the principles of microbiology, including the classification, morphology, and growth of microorganisms.
- Recognize the causes, classifications and symptoms for various bacterial, viral, fungal, and parasitic infections.
- Demonstrate knowledge of sterilization methods, disinfection practices, and strategies for preventing nosocomial infections.
- Describe the mechanisms of immunity, hypersensitivity reactions, and the principles of immunization.

### Course Plan

Unit	Topic	Hours
1	<b>Fundamentals of Microbiology:</b> Introduction to microbiology and classification of microorganism. Bacterial morphology and classification. Growth, cultivation, and identification of bacteria.	9 Hours
2	<b>Bacterial Infections and Systemic Bacteriology:</b> Systemic Bacteriology (Gram-positive, Gram-negative, anaerobic bacteria, Mycobacterium tuberculosis) & normal flora.	9 Hours
3	<b>Disinfection, Sterilization &amp; Infection Control:</b> Disinfection (disinfectants used in hospitals). Sterilization (methods, types, & applications). Nosocomial infections (causes, sources, routes, investigation & prevention)	9 Hours
4	<b>Immunology and Hypersensitivity:</b> Infection and immunity (types, sources, routes, and spread of infectious diseases) Immune response (humoral and cell-mediated immunity). Hypersensitivity (classification, mechanisms, and clinical aspects)	9 Hours

Unit	Topic	Hours
5	<b>Virology, Mycology, Parasitology, and Safety Precautions:</b> <ul style="list-style-type: none"> <li>• Introduction to Virology (features, structure, classification, diagnosis). Introduction to Mycology (properties, classification, diagnosis).</li> <li>• Introduction to Parasitology (properties, classification, diagnosis).</li> <li>• Universal safety precautions. Biomedical waste management. Immunization (types of vaccines, immunization schedule)</li> </ul>	9 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• Compound microscope. Culture media.</li> <li>• Gram stain &amp; Acid-fast stain. Antibiotic susceptibility test. Sterilization Methods.</li> <li>• Chemical disinfectants.</li> <li>• Biomedical Waste Management &amp; PPE</li> </ul>	30 Hours
	<b>Total</b>	<b>75 Hours</b>

**Text Book/Reference Books:**

- Textbook of Microbiology -Ananthanarayan and Paniker's, 13th edition.
- Textbook of Microbiology - C.P baveja, 7<sup>th</sup> edition.

**2. Subject: Pathology**

CL	CP	L	P
3	1	45	30

**Instructors in charge:** MD Pathology/ PhD Pathology or Equivalent with experience.

Course Description:

This course describes basic aspects of diseases, including their causes, development, and effects on the body.

**Objectives:** At the end of the semester, the student should be able to:

- Describe the basic pathological processes and mechanisms of disease.
- Identify and describe the morphological changes in cells and tissues.
- Understand the etiology, pathogenesis, and clinical manifestations of various diseases

## Course Plan

Unit	Topic	Hours
1	General Introduction to Pathology. <b>Cell &amp; Inflammation:</b> Cell injury, Cellular adaptation & cell death. Etiology, Pathogenesis & Morphology of Cell Injury. Reversible and irreversible cell injury. Cellular adaptations of growth and differentiation. Acute & chronic Inflammation, mediators of inflammation & healing.	9 Hours
2	<b>Infectious and Parasitic Diseases:</b> Viral infections – Dengue, Hepatitis, Rabies, Varicella-zoster diseases. Bacterial infections- Typhoid, Tuberculosis, cholera. Fungal infections- Candidiasis. Parasitic infection-Malaria.	9 Hours
3	<b>Neoplasia:</b> Definition, Differences between benign & malignant neoplasms. <b>Immunopathology:</b> Immunity- definition, types, Hypersensitivity reactions, AIDS.	9 Hours
4	<b>Circulatory disturbances:</b> Blood groups, Shock, Thrombosis, Embolism, Infarction, Anemia, hemostasis & DIC.	9 Hours
5	<b>Systemic pathology:</b> Meningitis, Heart failure, Ischemic heart diseases, Respiratory distress syndrome, Renal failure.	9 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	Hands-on practice in microscope to identify normal and abnormal blood cells. Hands-on practice of analyzing urine samples Microbiological techniques such as Gram staining, culture testing. <b>Specimens:</b> Left ventricular hypertrophy of Heart, Tuberculosis organs, Gangrene Foot, Lung Abscess, Torsion of Testis, Lobar pneumonia. <b>Instruments:</b> Wintrobe's Tube, Haemocytometer with RBC & WBC, Pipette, Haemoglobinometer, Urinometer, Cytochrome stain, Mounting jar, Bone marrow aspiration needle, Lumbar puncture needle	30 Hours
	<b>Total</b>	<b>75 Hours</b>

### Text Book/Reference Books:

- Textbook of pathology - Harsh Mohan, 9th edition
- ROBINS and KUMAR: Basis pathology, 11<sup>th</sup> Edition.

### 3. General Concepts of Pharmacology

CL	CP	L	P
3	1	45	30

**Instructors in charge:** MD Pharmacology / PhD Pharmacology / M.Pharm or Pharm D who have adequate experience in teaching pharmacology.

**Course Description:**

This course covers the mechanisms of action, indications, dosage, adverse effects and routes of administration of life-saving and widely used medications in the emergency department and EMS.

**Objectives:** At the end of the semester, the student should be able to:

- Understand pharmacology principles (pharmacokinetics, pharmacodynamics, adverse reactions).
- Know major drug classes, their uses, and interactions.
- Identify drugs used in Emergency Department and describe their pharmacology, route of administration, uses and adverse effects

#### Course Plan

Unit	Topic	Hours
1	<b>General Pharmacology:</b> Introduction, Routes of drug administration, Pharmacokinetics, Pharmacodynamics, factors affecting drug actions & adverse drug effects. <b>Drugs used for autonomic nervous system:</b> Sympathetic agonists, Sympathetic antagonists & Parasympathetic agonists, Parasympathetic antagonists.	9 Hours
2	<b>Drugs used for Central Nervous System:</b> Alcohol, sedative hypnotics, Depressants, anticonvulsants, Histamines and Anti histamines, General & local anesthetics, Opioids & non-opioid analgesics.	9 Hours
3	<b>Drugs used for cardiovascular system:</b> Drugs for heart failure, Antiarrhythmic drugs, Antianginal drugs, Antihypertensive drugs, diuretics, Coagulants and Anticoagulants.	9 Hours
4	<b>Drugs for respiratory system:</b> Drugs for cough and bronchial asthma. <b>Drugs used for gastro intestinal system:</b> H2 antagonists, proton pump inhibitors, antacid, antiemetics, prokinetics, antidiarrheal drugs.	9 Hours

Unit	Topic	Hours
5	<p><b>Drugs used for endocrine and metabolic system:</b> Thyroxin, antithyroid drugs, Insulin and oral antidiabetic agents, corticosteroids.</p> <p><b>Antimicrobial drugs:</b> Antibiotics, antiviral, antifungal, antitubercular drugs.</p>	9 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Hands-on practice of administering medications via different routes on mannequin.</li> <li>Practice calculating medication dosages.</li> <li>Dilution of medications in various agents.</li> <li>Simulation of Identification and management of adverse drug reactions.</li> <li>Hands-on practice for preventing medication errors and ensuring patient safety.</li> </ul>	30 Hours
	<b>Total</b>	75 Hours

**Text Book/Reference Books:**

- Essentials of medical pharmacology - K D Tripathi 9th edition
- Pharmacology For Medical Graduates - Tara V Shanbhag 6<sup>th</sup> edition.

**4. Instrumentation of EMS (Part-1)**

CL	CP	L	P
3	1	45	30

**Instructors in charge:** Bachelor of Emergency Medical Technologist (Paramedic) Masters of Advance Care Paramedic Equivalent with experience.

**Course Description:**

This course covers the fundamental principles, parts and practical applications of basic instrumentation used in emergency care and emergency medical services

**Objectives:** At the end of the semester, the student should be able to:

- Understand the principles and operation of basic emergency medical equipment.
- Develop skills in using emergency equipment and communication systems
- Apply safety protocols and precautions in emergency situations

## Course Plan

Unit	Topic	Hours
1	Pulse oximeter, Thermometer, Stethoscope, ECG machine, BP apparatus, Glucometer, Multipara Monitor, Oxygen cylinders, Oxygen delivery devices (nasal cannula, simple face mask, venturi mask, NRB Mask, HFNC), Bag-valve-mask (BVM), Bain's circuit.	9 Hours
2	Nasopharyngeal airway, Oropharyngeal Airway, Supraglottic Airway devices (LMA, King LT), Laryngoscope with various blades, Endotracheal Tube (Sizes for adults and pediatrics), Intubating Stylet, Bougie, ET Tube Exchanger.	9 Hours
3	Syringes, Needles & IV Cannulas (Various sizes). IV set, IV fluids. Suturetray (needles drivers, forceps, scissors). Suture materials & needle (various sizes) Absorbable & Non absorbable. Skin adhesive materials.	9 Hours
4	Dressing & bandage Materials, Tourniquet (Elastic, CAT & Pneumatic). Splinting and Traction Devices, C-collar, Long & short Spine Boards, Scope Board, Kendrick Extrication Devices.	9 Hours
5	AED, Defibrillator, Infusion Pump, Syringe pump, Suction apparatus, Nebulizer. NG / OG Tubes. Urinary Catheter. Urine Collection bag / Meter	9 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Identify the equipment and its parts Uses and indications for the equipment</li> <li>Steps to use and troubleshoot the equipment Complications and potential errors</li> <li>Practical hands-on experience with the equipment.</li> <li>Steps to use and troubleshoot the equipment Complications and potential errors</li> <li>Practical hands-on experience with the equipment.</li> </ul>	30 Hours
	<b>Total</b>	<b>75 Hours</b>

### Text Book/Reference Books:

- Roberts and Hedges' CLINICAL PROCEDURES in Emergency Medicine and Acute Care – 7<sup>th</sup> edition.

## 5. Community Medicine

CL	CP	L	P
1	1	15	30

**Instructors in charge:** M.D Community Medicine / Masters or Ph.D. in community medicine with adequate experience in teaching.

**Course Description:** This course covers epidemiology, focusing on disease prevention, transmission and control. Students will learn about immunization, hospital infections, health education, and communicable diseases.

**Objectives:** At the end of the semester, the student should be able to:

- Understand how diseases spread and how to prevent them.
- Recognize and manage common communicable diseases.
- Apply health education and promotion principles to improve community health.

### Course Plan

Unit	Topic	Hours
1	Introduction, Importance of Community Medicine. Definitions of various terms. Definition and basics of epidemiology. Modes of transmission of diseases. Principles of prevention and control of diseases.	5 Hours
2	Immunization. Hospital infections, disinfection, disinfestation, & Sterilization. Nutrition and Health. Disposal of hospital wastes. Health Education	5 Hours
3	Important communicable diseases: Respiratory –Chickenpox, Rubella, Influenza & Tuberculosis. Intestinal –Hepatitis, Cholera, Typhoid. Contact-STD / AIDS. Others - Dengue, Malaria & Rabies.	5 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	Conducting a mock epidemiological study to understand disease transmission and control measures. Demonstration of vaccination techniques and discussion on immunization schedules. Practical demonstration of disinfection and sterilization methods in a hospital setting. Case study analysis of a communicable disease outbreak.	30 Hours
	<b>Total</b>	<b>45 Hours</b>

### Text Book/Reference Books:

- Park's Text Book of Preventive and Social Medicine- 28 edition
- IAPSM textbook of community medicine - 3rd edition

## 6. Psychology

CL	CP	L	P
1	1	15	30

**Instructors in charge:** Masters or M.Phil. in Psychology / Ph.D. in Psychology or M.D Psychiatric Medicine with adequate experience in teaching.

### Course Description:

This course teaches paramedics to assess and manage patients in emergency situations, covering psychological disorders, stress, and crisis intervention.

**Objectives:** At the end of the semester, the student should be able to:

- Understand the relevance of psychology to health professional practice.
- Apply psychological theories and concepts to emergency paramedicine.
- Develop strategies for coping with patients and managing stress.
- Provide psychological support to patients, families, and health professionals.

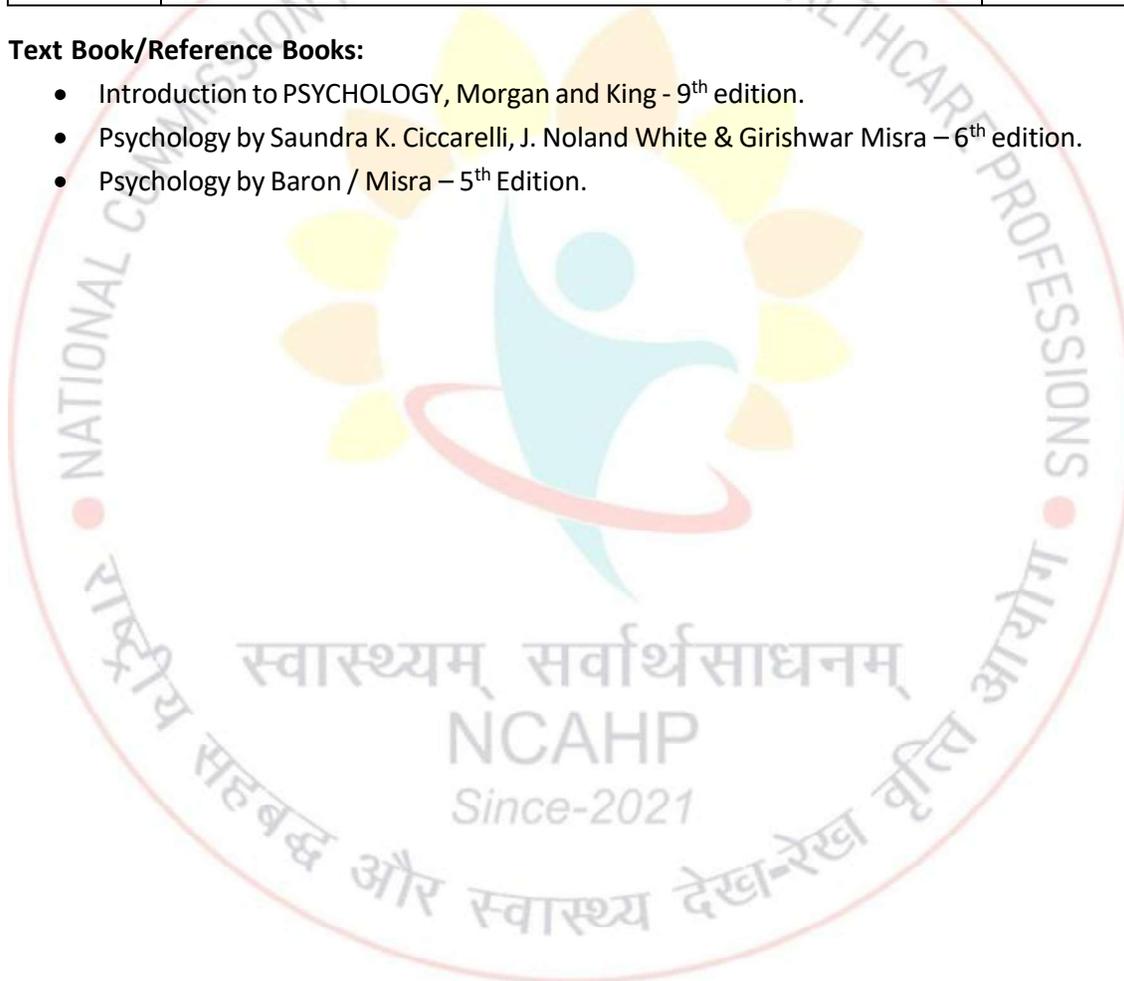
### Course Plan

Unit	Topic	Hours
1	<b>Introduction to Psychology and Human Behavior</b> Definition and scope of psychology Branches of psychology Human behavior and stress response Introduction to normal and abnormal behavior	5 Hours
2	<b>Abnormal Psychology and Crisis Response</b> Introduction to abnormal psychology Anxiety, trauma, and stress-related disorders (panic, phobia, OCD, PTSD) Crisis communication and intervention Psychological support for patients and families	5 Hours
3	<b>Human Behavior and Stress Management in Emergency Situations</b> Human behavior in emergency situations Stress response models (Hans Selye, Lazarus and Folkman) Sources of stress and stress management techniques Changing health-impairing behavior Well-being and stress management for paramedics Psychological First Aid	5 Hours

Unit	Topic	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• Demonstration of patient assessment techniques</li> <li>• Demonstration of providing psychological support to patients and families</li> <li>• Practice session on managing difficult patient interactions</li> <li>• Simulation of counselling and psychotherapy techniques</li> <li>• Apply relaxation techniques for patients and paramedics</li> <li>• Demonstration of crisis communication techniques</li> <li>• Introduce stress management techniques for paramedics</li> <li>• Promote well-being and self-care for paramedics</li> </ul>	30 Hours
	<b>Total</b>	<b>45 Hours</b>

**Text Book/Reference Books:**

- Introduction to PSYCHOLOGY, Morgan and King - 9<sup>th</sup> edition.
- Psychology by Saundra K. Ciccarelli, J. Noland White & Girishwar Misra – 6<sup>th</sup> edition.
- Psychology by Baron / Misra – 5<sup>th</sup> Edition.



## Third Semester

### 1. Introduction to Patient Assessment and Care

CL	CP	L	P
1	1	45	30

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description:** This course provides a comprehensive foundation in patient assessment and care, with a strong emphasis on clinical reasoning and emergency response. Through detailed instruction and hands-on practice, students will explore the key components of a thorough medical history and physical examination, particularly in emergency scenarios.

**Objectives:** At the end of the semester, the student should be able to:

- To introduce students to the principles and techniques of effective doctor–patient communication and history taking.
- To train students in conducting systematic general and system-wise physical examinations.
- To familiarize students with common signs and symptoms of medical emergencies.
- To develop skills in documentation, clinical reasoning, and patient presentation.
- To enable rapid recognition and assessment of critical conditions across various systems (respiratory, cardiovascular, CNS, GI, urinary, muscular, and skeletal).
- To instil awareness of ethical considerations and effective decision-making in emergency settings.



## Course Plan

Unit	Topic	Hours
1	<b>Doctor–Patient Interaction &amp; History Taking</b> <ul style="list-style-type: none"> <li>• Medical Terminology</li> <li>• Introduction to effective communication in emergencies</li> <li>• Ethical considerations in emergency settings</li> <li>• The art of history taking under time constraints</li> <li>• Components of history taking: Presenting complaints, History of present illness (HOPI), Past medical and surgical history, Medication history, Family history, social history and allergies</li> <li>• Routine screening questions in emergency triage</li> <li>• Writing and documenting medical history</li> <li>• SOAP format in EMS</li> <li>• Physical examination basics</li> <li>• How to present a case orally and in writing</li> <li>• Interpretation and clinical correlation of findings</li> </ul>	9 Hours
2	<b>General Examination</b> <ul style="list-style-type: none"> <li>• Assessing General Health Condition</li> <li>• Level of Consciousness (GCS, AVPU)</li> <li>• Pain Assessment Scales</li> <li>• Nutritional Status (BMI)</li> </ul> <p>Vital Signs Assessment: Temperature, Pulse, Respiratory Rate, Blood Pressure, Oxygen Saturation (SpO<sub>2</sub>), Capillary Refill Time (CRT), Pupillary Reaction and Size</p>	4 Hours

Unit	Topic	Hours
3	<p><b>Examination of the Respiratory System</b></p> <ul style="list-style-type: none"> <li>• Anatomy and physiology review of the respiratory system</li> <li>• Inspection, palpation, percussion, and auscultation</li> <li>• Identification of abnormal breath sounds (e.g., wheeze, crackles)</li> <li>• Assessment of respiratory distress</li> <li>• Oxygen saturation interpretation (SpO<sub>2</sub>)</li> </ul> <p><b>Examination of the Cardiovascular System</b></p> <ul style="list-style-type: none"> <li>• Heart sounds and murmur basics</li> <li>• Palpation of pulses</li> <li>• Capillary refill and perfusion assessment</li> <li>• Blood pressure measurement (manual and automatic)</li> </ul> <p><b>Examination of the Gastrointestinal System</b></p> <ul style="list-style-type: none"> <li>• Abdominal quadrants and organ location</li> <li>• Abdominal pain assessment</li> <li>• GI history: appetite, bowel, vomiting, bleeding</li> <li>• Physical exam: inspection, auscultation, percussion, palpation</li> </ul> <p><b>Examination of the Urinary System</b></p> <ul style="list-style-type: none"> <li>• History taking: urinary frequency, urgency, dysuria, haematuria, incontinence</li> <li>• Inspection of abdomen for bladder distension</li> <li>• Palpation of kidneys (ballottement technique)</li> <li>• Costovertebral angle tenderness (CVA tenderness)</li> <li>• Urine output monitoring (catheterization, urometer)</li> <li>• Urine color, smell, and consistency</li> <li>• Assessment of fluid balance and signs of dehydration</li> <li>• Recognition of acute kidney injury (AKI) signs</li> </ul>	20 hours

Unit	Topic	Hours
4	<p><b>Examination of the Central Nervous System (CNS)</b></p> <ul style="list-style-type: none"> <li>• Mental status exam in emergencies</li> <li>• Glasgow Coma Scale (GCS)</li> <li>• Pupil size and reactivity</li> <li>• Cranial nerve overview</li> <li>• Motor and sensory examination</li> </ul> <p><b>Examination of the Muscular System</b></p> <ul style="list-style-type: none"> <li>• Inspection for muscle wasting, hypertrophy, fasciculation's</li> <li>• Muscle tone evaluation (spasticity vs. flaccidity)</li> <li>• Muscle strength grading (0–5 scale)</li> <li>• Range of motion (active and passive)</li> <li>• Functional testing (e.g., grip strength, standing/squatting)</li> <li>• Assessment of trauma-related muscle injury</li> <li>• Clinical recognition of myopathies, rhabdomyolysis</li> <li>• Muscle tenderness or swelling (compartment syndrome)</li> </ul> <p><b>Examination of the Skeletal System</b></p> <ul style="list-style-type: none"> <li>• History: trauma, pain, swelling, loss of function</li> <li>• Inspection for deformities, swelling, redness</li> <li>• Palpation for tenderness, crepitus, temperature</li> <li>• Range of Motion (ROM) assessment for major joints</li> <li>• Examination of fractures, dislocations</li> <li>• Assessment of limb shortening or misalignment</li> </ul>	6 hours
5	<p><b>Focused areas Physical Examination</b></p> <ul style="list-style-type: none"> <li>• <b>Skin</b> Colour, temperature, hydration, Signs of cyanosis, pallor, jaundice</li> <li>• <b>Head &amp; Face</b> Scalp injuries, deformities, trauma</li> <li>• <b>Eyes</b> Pupil reaction, foreign bodies, trauma</li> <li>• <b>Ears</b> Bleeding, discharge, hearing loss</li> <li>• <b>Nose and Sinuses</b> Epistaxis management, trauma signs</li> <li>• <b>Mouth, Tongue, Throat</b>, Oral hygiene, hydration status, airway obstruction, tonsils, uvula</li> <li>• <b>Teeth and Gums</b> Dental abscess, trauma evaluation</li> <li>• <b>Neck</b>-Lymph nodes, tracheal position, jugular vein distention</li> <li>• <b>Nails</b> – clubbing, koilonychias</li> </ul>	6 hours

Unit	Topic	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	History Taking Practice (SOAP format, presenting complaints, triage- based questioning) General Examination – Vitals (Temp, Pulse, BP, RR, SpO <sub>2</sub> , CRT, GCS, BMI) Respiratory & Cardiovascular Exam – Auscultation, percussion, BP, pulse, murmur recognition Abdominal & Urinary System Exam – Palpation, tenderness, CVA, bladder inspection CNS & Musculoskeletal Exam – Cranial nerves, ROM, muscle strength Focused Physical Exam – Head-to-toe (Skin, eyes, ears, oral cavity, neck, nails)	30 Hours
	<b>Total Hours</b>	<b>75 Hours</b>

**Text Book/Reference Books:**

- Nancy Caroline’s Emergency Care in Street, 8<sup>th</sup> Edition.
- Mosby’s Paramedic Textbook, 4<sup>th</sup> Edition by Mick J Sanders

**2. Medical Emergencies Part-1**

CL	CP	L	P
3	1	45	30

**(Respiratory, Cardiovascular, Neurological, Gastrointestinal and Genitourinary)**

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or equivalent with experience.

**Course Description:**

This course is designed to equip healthcare professionals with the knowledge and skills necessary to recognize, assess, and manage a wide range of system-specific medical emergencies. Students will also develop critical decision-making skills, focusing on the evaluation of emergency severity and the implementation of evidence-based interventions. Scenarios and case studies will reinforce the ability to act swiftly and competently in emergency situations.

**Objectives:** At the end of the semester, the student should be able to:

- Understand the basic anatomy and physiology of major organ systems related to emergency care.
- Recognize, describe, and classify various respiratory, cardiovascular, neurological, gastrointestinal, and genitourinary emergencies.
- Assess and interpret clinical signs and symptoms associated with system-specific emergencies.

- Apply critical thinking to differentiate between infectious and non-infectious conditions in emergency scenarios.
- Demonstrate essential skills in emergency patient assessment and contribute to timely diagnosis and care in critical settings

### Course Plan

Unit	Topic	Hours
1	<p><b>Respiratory Emergencies</b></p> <p>Emergency Respiratory Diseases : Asthma Exacerbation, Status Asthmaticus Acute Respiratory Distress Syndrome (ARDS) , Bronchitis , Obstructive Sleep Apnea (OSA) , Cystic Fibrosis, Chronic Obstructive Pulmonary Disease (COPD) Exacerbation, Upper Airway Obstruction, Pneumonia, Pulmonary Oedema, Pulmonary Embolism, Pneumothorax / Tension Pneumothorax, Respiratory Arrest / Apnea, Respiratory failure, Tuberculosis (TB), COVID-19 /Viral Respiratory Illnesses, Foreign Body Aspiration, Epiglottitis, Interstitial Lung Disease (ILD), Occupational lung diseases, genetics (Alpha-1 Antitrypsin Deficiency ,Pulmonary Arterial Hypertension, Surfactant Protein Deficiency),Air Pollution related Respiratory emergency ,plural effusion</p> <p>Infective Respiratory Diseases: Empyema, Influenza and H1N1-related Lung Complications, Respiratory Syncytial Virus (RSV) in Children, Fungal Lung Infections (e.g., Aspergillosis, Histoplasmosis), Septic Pulmonary Embolism, Legionnaires' Disease, Pertussis and Diphtheria, Pneumocystis Pneumonia (PCP) in Immunocompromised, Mycoplasma and Atypical Pneumonias</p> <p>Non-Infective Respiratory Diseases: Pulmonary Fibrosis and Interstitial Lung Disease, Pneumothorax (Spontaneous, Traumatic), Sleep Apnea (Obstructive and Central), Allergic Bronchopulmonary Aspergillosis (ABPA), Sarcoidosis, Anaphylaxis with Respiratory Compromise, Occupational Lung Diseases (Silicosis, Asbestosis), Lung Cancer and Superior Vena Cava Syndrome, Drug-Induced Pulmonary Toxicity</p>	9 Hours

Unit	Topic	Hours
2	<p><b>Cardiovascular Emergencies</b></p> <p>Emergency cardiovascular disease: Myocardial Infarction (MI), Angina (Stable/Unstable), Cardiac Arrest, Heart Failure (Left/Right), Hypertensive Crisis, Arrhythmias (AF, VT, VF), Bradycardia/Tachycardia, Pericardial Tamponade, Pulmonary Embolism, Shock (Cardiogenic), Endocarditis, Aortic Dissection, Syncope (Cardiac Origin), Cardiomyopathies, Congenital Heart Diseases</p> <p>Infective cardiovascular disease: Infective Endocarditis, Prosthetic Valve Endocarditis Drug Use–Associated Endocarditis, Viral Myocarditis, Bacterial Myocarditis, Parasitic Myocarditis (e.g., Chagas Disease), Fungal Myocarditis, Viral Pericarditis, Bacterial Pericarditis, Tuberculous Pericarditis, Fungal Pericarditis, Rheumatic Heart Disease, Sepsis-Induced Myocardial Dysfunction, Device- Related Infections (Pacemakers, Valves), Catheter-Associated Cardiac Infections, COVID-19 Related Cardiac Infections, Post- Infectious Cardiomyopathy, Pericardial Effusion due to Infection, Cardiovascular Syphilis (Advanced Stage), Lyme Carditis</p> <p><b>Non-infective cardiovascular disease:</b></p> <p>Hypertension (Essential and Secondary), coronary artery disease (CAD) Valvular Heart Diseases (Aortic Stenosis, Aortic Regurgitation, Mitral Stenosis, Mitral Regurgitation, Tricuspid Valve Disorders), Pericardial Effusion, Aortic Aneurysm and Aortic Dissection, Peripheral Artery Disease (PAD), Pulmonary Hypertension (Non-Genetic/Non-Infective), Marfan Syndrome and Other Connective Tissue Disorders Affecting the Heart, Myocardial Contusion (Trauma-Induced), Stress Cardiomyopathy (Takotsubo), Cardiac Tumours (e.g., Myxoma), Orthostatic Hypotension, Cardiac Syncope (Non-Infective Causes), Hyperlipidaemia and Atherosclerosis</p>	10 Hours

Unit	Topic	Hours
3	<p><b>Neurological Emergencies</b></p> <p><b>Emergency Neurological Conditions:</b> Stroke (Ischemic and Hemorrhagic), Transient Ischemic Attack (TIA), Seizure and Status Epilepticus, Traumatic Brain Injury (TBI), Concussion, Skull Fracture, Meningitis and Encephalitis, Subarachnoid Hemorrhage, Subdural and Epidural Hematomas, Spinal Cord Injury, Acute Neuropathy (e.g., Guillain-Barré Syndrome), Migraine and Cluster Headaches (Acute Phase), Intracranial Space-Occupying Lesions (e.g., Tumor bleed), Neurogenic Shock, Delirium and Acute Confusional States, Acute Flaccid Paralysis, Brain Death Criteria and Neurological Examination</p> <p><b>Infective Neurological Diseases:</b> Bacterial Meningitis (e.g., Meningococcal, Pneumococcal), Viral Meningitis (e.g., Enteroviruses, HSV), Encephalitis (Herpes Simplex Virus, Arboviral, Japanese Encephalitis), Brain Abscess, Neurocysticercosis, Tuberculous Meningitis, Neurosyphilis, Cryptococcal Meningitis (in HIV), prion diseases (e.g., CJD), HIV-Associated Neurocognitive Disorders, Sepsis-associated encephalopathy</p> <p><b>Non-Infective Neurological Diseases:</b> Epilepsy (Focal and Generalized), Multiple Sclerosis (MS), Parkinson's Disease, Myasthenia Gravis, Motor Neuron Disease (e.g., ALS), Neurodegenerative Disorders (e.g., Alzheimer's, Dementia), Peripheral Neuropathy (Diabetic, Toxic, Idiopathic), Bell's Palsy, TIA due to atherosclerosis, Tics and Tourette Syndrome, Space-occupying lesions (benign/malignant brain tumors), CNS Manifestations of Autoimmune Disease (e.g., SLE, Vasculitis), Neurotoxin-related Injury (e.g., Snakebite, Lead poisoning), Genetic and Developmental Neurological Disorders</p>	8 hours

Unit	Topic	Hours
4	<p><b>Gastrointestinal Emergencies</b></p> <p>Emergency GI Conditions: Upper GI Bleed: Oesophageal varices, Mallory-Weiss tear, Peptic ulcer, Lower GI Bleed: Diverticulosis, Colorectal carcinoma, Inflammatory bowel disease, Acute Pancreatitis, Acute Appendicitis, Bowel Obstruction (Small and Large), Peritonitis, Perforated Peptic Ulcer, Cholecystitis / Biliary Colic, Cholangitis (Charcot's triad), Acute Hepatitis, Mesenteric Ischemia, Hernia with Strangulation, Gastroenteritis with Severe Dehydration, Esophageal Obstruction or Foreign Body, Ascites with Spontaneous Bacterial Peritonitis, Gastrointestinal Perforation, Acute Gastric Dilatation</p> <p>Infective GI Diseases: Viral Hepatitis (A, B, C, E), Bacterial Gastroenteritis (Salmonella, Shigella, E. coli, Campylobacter), Clostridium difficile colitis, Parasitic Infections (Amoebiasis, Giardiasis), Typhoid and Paratyphoid Fever, Helicobacter pylori-associated ulcers, Tubercular enteritis, Liver abscess (Amoebic, Pyogenic), Ascariasis and intestinal helminths, Norovirus/Rotavirus in outbreaks</p> <p>Non-Infective GI Diseases: Peptic Ulcer Disease (non-infective aetiology), Inflammatory Bowel Disease (Crohn's, Ulcerative Colitis), Gastroesophageal Reflux Disease (GERD), Non-alcoholic Fatty Liver Disease (NAFLD), Alcoholic Hepatitis and Cirrhosis, Gallstones and Biliary Dyskinesia, Chronic Pancreatitis, Colorectal Cancer, Intestinal Polyps (Familial Adenomatous Polyposis), Celiac Disease, Autoimmune Hepatitis, Drug-Induced Liver Injury, Gastrointestinal Motility Disorders (e.g., IBS, Gastroparesis)</p>	9 hours
5	<p><b>Genitourinary Emergencies</b></p> <p>Emergency GU Conditions: Acute Urinary Retention, Renal Colic due to Ureteric Calculi, Acute Kidney Injury (AKI), Obstructive Uropathy, Urinary Tract Infections (UTI), Pyelonephritis, Urosepsis, Haematuria (Gross or Microscopic), Testicular Torsion, Priapism, Fournier's Gangrene, Post-obstructive Diuresis, Acute Prostatitis, Urinary Fistulae, Neurogenic Bladder (Acute Onset)</p> <p>Infective GU Diseases: Lower UTI (Cystitis, Urethritis), Upper UTI (Pyelonephritis), Catheter-Associated UTI, Sexually Transmitted Infections (STIs): Gonorrhoea, Chlamydia, Genital Herpes, HIV-associated nephropathy, Tuberculosis of the Genitourinary Tract, Prostatic abscess, Vulvovaginal Candidiasis (with urinary complaints), Renal abscess, Perinephric abscess</p>	9 hours

Unit	Topic	Hours
	Non-Infective GU Diseases: Benign Prostatic Hyperplasia (BPH), chronic kidney disease (CKD), Nephrotic Syndrome, Glomerulonephritis (IgA nephropathy, post-infectious, etc.), Polycystic Kidney Disease (PKD), Renal Artery Stenosis, Urolithiasis (non-infective stones), Bladder Tumours, Renal Cell Carcinoma, Interstitial Cystitis, Neurogenic Bladder (Chronic), Erectile Dysfunction (Non-psychogenic)	
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• System-wise case presentation practice (Respiratory, CVS, Neuro)</li> <li>• Symptom-based triage simulations (e.g., chest pain, breathlessness)</li> <li>• Emergency vital signs and monitoring in system-specific cases</li> <li>• Neurological and GI case-based discussion and clinical signs</li> <li>• Assessment of renal emergencies with case vignettes</li> <li>• Documentation practice (SOAP, emergency notes, diagnosis)</li> </ul>	30 Hours
	<b>Total</b>	<b>75 Hours</b>

**Text Book/Reference Books:**

- Rosen's Emergency Medicine: Concepts and Clinical Practice, vol.1 and 2
- Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice - 2017 edition
- Nancy Caroline Emergency Care in the streets - 8th edition
- Mosby's EMT basic textbook 2nd edition
- Tintinalli's textbook of Emergency Medicine- Judith E. Tintinalli 9th edition
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition

**3. Trauma- Part-1**

CL	CP	L	P
3	1	45	30

**Introduction to Trauma, Hemorrhage and Shock, Head and Facial Trauma, Thoracic and Abdominal Trauma**

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description:**

This course provides students with advanced training in the assessment, triage, and initial management of trauma patients across pre-hospital settings. Emphasizing a systems-based and evidence-informed approach. Through scenario-based learning and case analysis, paramedics will learn to differentiate types of trauma, recognize organ-specific injuries, and make informed decisions regarding transport priorities and early interventions. The course reinforces clinical judgment in the field to optimize patient outcomes during the critical pre-hospital window.

**Objectives:** At the end of the semester, the student should be able to:

- To define trauma and explain its epidemiology, classification, and pathophysiology.
- To understand the principles of trauma systems, pre-hospital triage, and transport decisions.
- To apply the structured approach (ABCDE) for primary and secondary trauma surveys.
- To recognize and manage hemorrhagic and traumatic shock effectively.
- To assess and manage head, facial, thoracic, and abdominal trauma using evidence-based practices.
- To develop skills in early trauma recognition, patient monitoring, communication, and procedural techniques.

### Course Plan

Unit	Topic	Hours
1	<p><b>Introduction to Trauma Terminology</b>            Definition and scope of trauma, Epidemiology of trauma (global and national), Classification of trauma (blunt, penetrating, polytrauma, etc.), Mechanisms of injury (MOI): MVCs, falls, assaults, blast injuries, The Golden Hour and concept of the trauma triad of death (hypothermia, acidosis, coagulopathy)</p> <p><b>Trauma Systems and Prehospital Care</b>, Components of a trauma system, Levels of trauma centers, Role of EMS in trauma care, Scene safety and triage (START, SALT), Transport decisions: "Stay and play" vs "scoop and run", Documentation and communication with hospital teams.</p> <p><b>Primary and Secondary Survey</b>, Initial assessment and resuscitation: ABCDE approach, A: Airway with cervical spine protection, B: Breathing and ventilation C: Circulation with hemorrhage control, D: Disability (neurologic assessment, AVPU/GCS), E: Exposure and environment control Secondary survey: head-to-toe exam, Monitoring and reassessment, ECG, pulse oximetry, BP, capnography, FAST ultrasound</p>	9 Hours

Unit	Topic	Hours
2	<p><b>Haemorrhage and shock</b></p> <p>Introduction to Shock in Trauma, Types of shock in trauma (hypovolemic, neurogenic, obstructive), causes, pathophysiology, Early recognition and management, Fluid resuscitation (crystalloids, blood products, fluid calculation), Permissive hypotension, massive transfusion protocol (MTP)</p>	10 Hours
3	<p><b>Head and facial trauma</b></p> <ul style="list-style-type: none"> <li>• Head Trauma, types of injury, Mechanisms of injury, Signs and Symptoms, Emergency Management</li> <li>• Facial Trauma types of injury, Mechanisms of injury, Signs and Symptoms, Emergency Management</li> <li>• Fractures and Classifications, Nasal fractures, Zygomatic complex fractures, Orbital blow-out fractures, Le Fort classification (I, II, III) for maxillary fractures, Mandibular fractures (angle, condyle, parasymphysis) types of injury, Mechanisms of injury, Signs and Symptoms, Emergency Management</li> <li>• Orthopaedic Involvement in Craniofacial Trauma, Open vs closed fractures, Temporomandibular joint dislocation, Facial trauma with associated orthopedic injuries (e.g., clavicle, shoulder), Role of maxillofacial surgeon vs orthopedic surgeon, Splinting</li> <li>• principles</li> </ul>	8 hours
4	<p><b>Thoracic Trauma</b></p> <p>Classification of Thoracic Injuries:</p> <p><b>Bony injuries:</b></p> <ul style="list-style-type: none"> <li>• Rib fractures (single, multiple, flail chest) Sternum fracture</li> <li>• Clavicle and scapula fractures Thoracic vertebral fractures</li> </ul> <p><b>Soft tissue and internal injuries:</b></p> <ul style="list-style-type: none"> <li>• Pulmonary contusion</li> <li>• Pneumothorax, Tension pneumothorax, Hemothorax, Cardiac tamponade</li> <li>• Tracheobronchial rupture Diaphragmatic rupture Aortic injury</li> </ul>	9 hours

Unit	Topic	Hours
5	<p><b>Abdominal trauma</b> Organ-specific Trauma <b>Liver trauma</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation, grading, conservative vs. operative management <b>Splenic injury</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation, non-operative vs. splenectomy <b>Renal trauma</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation, haematuria, management approach <b>Bladder and urethral injury</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation, special signs, retrograde cystography <b>Pancreatic trauma</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation delayed presentation <b>Intestinal perforation</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation peritonitis and sepsis <b>Diaphragmatic injury</b> causes, mechanism of injury, Clinical Presentation and Initial Assessment, Diagnostic Evaluation association with blunt trauma</p>	9 hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• System-wise trauma case presentation practice (Head/Face, Thoracic, Abdominal trauma)</li> <li>• Trauma triage and transport decision simulations (using START/SALT, scoop-and-run vs. stay-and-play)</li> <li>• Emergency trauma assessment: Primary &amp; Secondary Survey (ABCDE, GCS, AVPU, FAST)</li> <li>• Head and facial trauma clinical signs + fracture classification and splinting techniques</li> <li>• Thoracic and abdominal injury case-based discussion (with physiological monitoring)</li> <li>• Shock recognition drills and trauma resuscitation (fluid calculation, MTP)</li> <li>• Trauma documentation practice (SOAP notes, trauma checklists, handover communication)</li> </ul>	30 Hours
	<b>Total</b>	<b>75 Hours</b>

**Text Book/Reference Books:****Reference textbooks:**

- Advanced Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT, 2022)
- Prehospital Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT)
- Textbook of Orthopedics, 5<sup>th</sup> edition, John Ebinezer.
- Textbook of orthopedics and traumatology, Mayil Vahanan Natarajan
- Nancy Caroline's Emergency Care in Street, 8<sup>th</sup> Edition

**4. Instrumentation - Part-2**

CL	CP	L	P
2	1	30	30

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description:**

This course introduces students to the fundamental principles and clinical applications of instrumentation used in critical care and emergency settings. With a focus on both theoretical knowledge and practical skills, students will explore the design, function, and safe operation of essential ICU and emergency medical devices.

**Objectives:** At the end of the semester, the student should be able to:

- Understand the fundamental principles and functioning of emergency and ICU equipment.
- Identify and operate infusion, drug delivery, and monitoring systems used in critical care.
- Demonstrate appropriate usage, safety, and troubleshooting procedures for life-support devices.
- Apply knowledge of diagnostic and supportive equipment in emergency and intensive care settings.
- Integrate advanced critical care technologies into patient management scenarios through simulation

## Course Plan

Unit	Topic	Hours
1	<b>Infusion and Drug Delivery Systems</b> Infusion pumps (syringe & volumetric) Smart pumps and drug library features PCA (Patient-Controlled Analgesia) Insulin pumps and anticoagulant infusers Safety checks and troubleshooting	4 Hours
2	<b>Respiratory, Neurological and Temperature Monitoring Devices</b> <ul style="list-style-type: none"> <li>• Intracranial Pressure (ICP) monitoring EEG machines (basic understanding) Pupilometers and reflex hammers</li> <li>• Temperature monitoring (core &amp; peripheral)</li> <li>• Neuromuscular monitors (Train of Four)</li> <li>• Arterial Line Monitoring</li> <li>• Central Venous Pressure (CVP) Monitoring Pulmonary Artery Catheters</li> <li>• Mechanical Ventilators Humidifiers and Nebulizers</li> </ul>	8 Hours
3	<b>Renal, GI, and Nutritional Support Devices</b> Dialysis Machines: Principles of CRRT and Hemodialysis Gastrostomy and Jejunostomy care equipment Parenteral Nutrition devices and tubing systems	6 hours
4	<b>Emergency Diagnostic and Imaging Tools</b> <ul style="list-style-type: none"> <li>• Portable X-ray and Ultrasound in emergency</li> <li>• Point-of-care testing (ABG analyzers, glucometers, lactate meters)</li> <li>• POCUS (Focused Assessment with Sonography in Trauma - FAST) Bedside ECHO</li> </ul>	6 hours
5	<b>Advanced and Specialized ICU Equipment</b> <ul style="list-style-type: none"> <li>• ECMO (Extracorporeal Membrane Oxygenation) basics Intra-aortic balloon pump (IABP)</li> <li>• Ventricular Assist Devices (VAD)</li> <li>• Organ support systems (Liver-assist devices)</li> <li>• Tele-ICU and smart ICU monitoring</li> </ul>	6 hours

Unit	Topic	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Demonstration and hands-on: Syringe/volumetric/smart pumps, PCA, insulin infusers</li> <li>Dialysis (CRRT and hemodialysis) machine setup and alarm response</li> <li>Tube feeding and parenteral nutrition setup with troubleshooting</li> <li>ICP monitor demo, pupillometer use, TOF testing, temperature monitoring</li> <li>Point-of-care diagnostic tools (ABG, glucometer, lactate meter)</li> <li>Point-of-care diagnostic tools (ABG, glucometer, lactate meter)</li> <li>Portable imaging (X-ray/USG), FAST scan, ECG/ECHO interpretation</li> <li>ECMO/IABP/VAD/liver-assist equipment: orientation and function overview</li> <li>ICU integration simulation (Tele-ICU, documentation, patient device mapping)</li> </ul>	30 Hours
	<b>Total</b>	<b>60 Hours</b>

**Text Book/Reference Books:**

- Nancy Caroline Emergency Care in the streets - 8th edition
- Mosby's EMT basic textbook 2nd edition
- Tintinalli's textbook of Emergency Medicine- Judith E. Tintinalli 9th edition
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition

**5. Indian Culture, Heritage, Yoga and Meditation**

CL	CP	L	P
2	1	30	15

**Instructors in charge:** Masters in the particular field or Equivalent with experience.

**Course Description:**

This interdisciplinary course offers students an immersive exploration into the profound legacy of Indian culture, heritage, yoga, and meditation, tracing its origins, philosophies, and evolving relevance in modern times. Designed to instill a deep appreciation for India's civilizational ethos, the course integrates historical knowledge with experiential learning to foster holistic development intellectual, emotional, physical, and spiritual.

**Objectives:** At the end of the semester, the student should be able to:

- Understand and respect the values and belief systems rooted in Indian culture
- Recognize the influence of Indian cultural traditions on health practices and patient behavior
- Identify key historical, social, artistic, and scientific contributions of ancient and medieval India
- Appreciate the importance of preserving tangible and intangible heritage
- Analyze the physiological and psychological benefits of yoga practices in managing stress and enhancing emotional well-being.
- Apply principles of therapeutic yoga in the management of common lifestyle and clinical conditions

## Course Plan

Unit	Topic	Hours
1	<p><b>Foundations and Philosophical Roots of Indian Culture</b></p> <ul style="list-style-type: none"> <li>• Definition, meaning, and scope of Indian culture</li> <li>• Unity in diversity: language, religion, customs, cuisine</li> <li>• Dharma, karma, and Purusharthas (goals of life)</li> <li>• Overview of six classical schools of Indian philosophy</li> <li>• Ahimsa, satya, seva, and spiritual wellness</li> <li>• Ethical conduct in Ayurveda and Siddha</li> <li>• Traditional ethics in modern healthcare professionalism</li> </ul> <p><b>Festivals, Rituals, and Cultural Beliefs in Health</b></p> <ul style="list-style-type: none"> <li>• Indian festivals and their social significance</li> <li>• Marriage, birth, death, and life-cycle rituals</li> <li>• Role of rituals and prayer in healing and recovery</li> <li>• Belief systems and their impact on healthcare-seeking behavior</li> </ul> <p><b>Indian Arts, Literature, and Symbolism in Healing</b></p> <ul style="list-style-type: none"> <li>• Classical dance, music, sculpture, and visual arts</li> <li>• Epics and scriptures: Ramayana, Mahabharata, Gita</li> <li>• UNESCO heritage and medical symbolism in architecture</li> <li>• Storytelling as a medium of healing and education</li> </ul> <p><b>Cultural Sensitivity and Family Dynamics in Healthcare</b></p> <ul style="list-style-type: none"> <li>• Cultural taboos: food, touch, gender, end-of-life care</li> <li>• Beliefs in karma, rebirth, and healing traditions</li> <li>• Case studies: impact of cultural understanding in care</li> <li>• Family systems, caregiving roles, and shared decision-making</li> <li>• Changing roles of women in healthcare</li> <li>• Community-based care approaches</li> </ul>	15 Hours

Unit	Topic	Hours
	<p><b>Traditional Knowledge Systems and Reflective Practice</b></p> <ul style="list-style-type: none"> <li>• Contributions of Ayurveda, Yoga, Siddha, Unani</li> <li>• Ancient Indian achievements in science and medicine</li> <li>• Environmental harmony and sustainability</li> <li>• Integrative approaches to health</li> <li>• Field visits to cultural sites or institutions</li> <li>• Reflective writing and student presentations on cultural themes</li> </ul> <p>Group discussion on Indian values in patient care</p>	
2	<p><b>Understanding Indian Heritage and Its Historical Roots</b></p> <ul style="list-style-type: none"> <li>• Meaning, components, and scope of Indian heritage (tangible &amp; intangible)</li> <li>• Historical timeline from Indus Valley to Modern India</li> <li>• Role of heritage in personal identity and nation-building</li> <li>• Key preservation institutions: ASI, INTACH, UNESCO</li> <li>• Contributions of Harappan, Mauryan, Gupta civilizations</li> <li>• Heritage developments during Mughal and Colonial eras</li> <li>• Influence of freedom movement on cultural consciousness</li> </ul> <p><b>Architectural and Monumental Heritage</b></p> <ul style="list-style-type: none"> <li>• Major architectural styles: Dravidian, Nagara, Indo-Islamic</li> <li>• Important temples, forts, palaces, mosques</li> <li>• Symbolism and function of heritage sites (stepwells, hospitals, universities)</li> <li>• Conservation techniques and preservation challenges</li> </ul> <p><b>Performing Arts, Literature, and Philosophical Traditions</b></p> <ul style="list-style-type: none"> <li>• Classical and folk dances (e.g., Bharatanatyam, Kathak)</li> <li>• Carnatic and Hindustani music traditions</li> <li>• Oral storytelling: Kathakali, Yakshagana, Baul traditions</li> <li>• Vedas, Sangam literature, Bhakti-Sufi poetry</li> <li>• Philosophical foundations: Vedic, Buddhist, Jain, Bhakti-Sufi</li> <li>• Interfaith harmony and spiritual healing in Indian traditions</li> <li>• Cultural integration in pluralistic society</li> </ul>	15 Hours

Unit	Topic	Hours
	<p><b>Scientific, Medical, and Everyday Heritage</b></p> <ul style="list-style-type: none"> <li>• Ayurveda, Siddha, Unani: principles and healing systems</li> <li>• Sushruta and Charaka’s medical legacy</li> <li>• Contributions to surgery, astronomy, and mathematics</li> <li>• Seasonal food regimens and health practices</li> <li>• Traditional crafts, handlooms, rural technologies</li> <li>• Heritage in food, festivals, and regional cuisines</li> <li>• Community participation and heritage tourism</li> </ul> <p><b>Experiential Learning and Heritage Reflection</b></p> <ul style="list-style-type: none"> <li>• Visit to a heritage monument, museum, or cultural center</li> <li>• Group project: poster/digital presentation on a heritage theme</li> <li>• Reflective writing: “My cultural roots and healthcare journey”</li> <li>• Quiz or exhibition on Indian heritage themes</li> </ul>	
3	<p><b>Foundations of Yoga and Meditation</b></p> <ul style="list-style-type: none"> <li>• Historical evolution of yoga: Vedic to modern</li> <li>• Definitions, goals, and types of yoga (Hatha, Raja, Bhakti, etc.)</li> <li>• Basic concepts in yoga philosophy: Pancha Koshas, Ashtanga Yoga</li> <li>• Health and disease in yoga framework</li> <li>• Yama and Niyama: ethical and personal guidelines</li> <li>• Science of meditation and neurophysiological basis</li> </ul> <p><b>Yogic Postures and Their Benefits</b></p> <ul style="list-style-type: none"> <li>• Categories of asanas: standing, sitting, supine, prone, balancing</li> <li>• Key postures and their anatomical/physiological benefits</li> <li>• Safety precautions and contraindications</li> <li>• Practice of 10–12 essential asanas (e.g., Tadasana, Bhujangasana, Shavasana)</li> </ul> <p><b>Pranayama, Bandhas, and Energy Control</b></p> <ul style="list-style-type: none"> <li>• Physiology of breathing and introduction to prana</li> <li>• Practice of pranayama techniques (Anulom Vilom, Bhramari, Kapalabhati, etc.)</li> <li>• Concept and awareness of Bandhas (Jalandhara, Uddiyana, Moola)</li> <li>• Integration of breath control with postures and relaxation</li> </ul>	15 hours

Unit	Topic	Hours
	<p><b>Meditation, Mindfulness, and Emotional Balance</b></p> <ul style="list-style-type: none"> <li>• Meditation vs. concentration vs. mindfulness</li> <li>• Techniques: breath awareness, mantra, guided imagery</li> <li>• Mindfulness in clinical practice and stress reduction</li> <li>• Yoga Nidra, progressive muscle relaxation</li> <li>• Yoga for emotional intelligence and resilience</li> <li>• Use of yoga in emergency and high-stress settings</li> </ul> <p><b>Clinical and Practical Applications of Yoga</b></p> <ul style="list-style-type: none"> <li>• Yoga therapy for lifestyle disorders (HTN, diabetes, asthma)</li> <li>• Role in pain, rehab, and surgical recovery</li> <li>• Case studies in clinical yoga</li> <li>• Daily practical sessions: asana, pranayama, meditation</li> </ul> <p>Peer teaching, feedback sessions, and self-reflection journal</p>	
	<b>Total</b>	<b>45 Hours</b>

**Text Book/Reference Books:** As per the Faculty

## 6. Soft Skills and Clinical Communication Skills

CL	CP	L	P
2	-	30	-

**Instructors in charge:** Masters in the particular field or Equivalent with experience.

### Course Description:

Effective emergency care is not solely about clinical expertise—it demands sharp communication, teamwork, emotional intelligence, and interpersonal sensitivity. This course is designed to equip students of emergency care with essential soft skills and clinical communication competencies vital for time-critical environments.

**Objectives:** At the end of the semester, the student should be able to:

- Demonstrate effective verbal and non-verbal communication with patients, caregivers, and team members
- Use empathy and professionalism in patient interactions
- Handle difficult conversations, including delivering bad news
- Work collaboratively in a healthcare team
- Exhibit leadership, time management, and emotional intelligence in stressful situations

## Course Plan

Unit	Topic	Hours
1	<p><b>Foundations of Healthcare Communication</b></p> <ul style="list-style-type: none"> <li>Importance and components of communication in clinical settings</li> <li>Verbal, non-verbal, and para-verbal communication</li> <li>Barriers to effective communication</li> <li>Active listening and self-awareness</li> <li>Building rapport with patients and families</li> <li>Open vs closed-ended questions</li> <li>ICE technique (Ideas, Concerns, Expectations)</li> <li>Empathy, compassion, and cultural sensitivity</li> </ul> <p><b>Clinical and Ethical Communication</b></p> <ul style="list-style-type: none"> <li>Patient history taking and case presentation</li> <li>Communication during examination</li> <li>Explaining diagnosis and procedures</li> <li>Informed consent: legal and ethical considerations</li> <li>SOAP format and clinical documentation</li> </ul> <p><b>Interpersonal Communication in Healthcare Teams</b></p> <ul style="list-style-type: none"> <li>Healthcare teams and collaborative roles</li> <li>SBAR format for interprofessional communication</li> <li>Conflict resolution, feedback exchange</li> <li>Respect in hierarchies and team dynamics</li> </ul> <p><b>Crisis and Special Situation Communication</b></p> <ul style="list-style-type: none"> <li>SPIKES protocol for breaking bad news</li> <li>Handling emotionally charged events and psychological first aid</li> <li>Communicating with families during critical events</li> <li>End-of-life and DNR conversations</li> <li>Communication with children, elderly, impaired, psychiatric patients</li> <li>Working with interpreters</li> </ul> <p><b>Professional Development and Practical Skills</b></p> <ul style="list-style-type: none"> <li>Time management, multitasking, and decision-making in emergencies</li> <li>Emotional intelligence, ethics, and professionalism</li> <li>Grooming, body language, and etiquette</li> <li>Simulations, role plays, OSCEs</li> </ul> <p>Reflective writing and peer feedback</p>	30 Hours
	<b>Total</b>	<b>30 Hours</b>

**Text Book/Reference Books:** As per the Faculty

Curriculum of Bachelors of Emergency Medical Technologist (Paramedic) and Masters of Advanced Care Paramedic  
(Intellectual property of National Commission for Allied and Healthcare Professions, Ministry of Health and Family Welfare)

## Fourth Semester

CL	CP	L	P
3	1	45	30

### 1. Medical Emergencies: Part-2

**(Pulmonology, Endocrine, Hematology, Immunological, Oncology, Psychiatry)**

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic),
- Masters of Advanced care paramedic or Equivalent with experience.

#### Course Description

This course introduces students to the recognition, assessment, and pre-hospital management of Medical emergencies.

#### Learning Objectives

By the end of this course, students will be able to:

- Identify and explain the causes of medical emergencies
- Explain the pathophysiology of the medical emergencies.
- Identify the clinical features related to the specific medical emergencies.
- Explain the diagnostic procedures for the specific medical emergency.
- Explain the treatment plan for a medical emergency.

#### Course Plan

Unit	Topic	Hours
1	<b>Metabolic and Endocrine Emergencies</b> <ul style="list-style-type: none"> <li>• Diabetic Ketoacidosis</li> <li>• Hyperosmolar–hyperglycemic state</li> <li>• Hypoglycemia</li> <li>• Thyroid Stroma</li> <li>• Myxedema coma</li> <li>• Adrenal crisis</li> <li>• Pheochromocytoma crisis</li> <li>• Amyloidosis</li> <li>• Metabolic acidosis</li> <li>• Metabolic alkalosis</li> </ul>	10 Hours

Unit	Topic	Hours
2	<b>Fluid and Electrolyte Imbalance</b> <ul style="list-style-type: none"> <li>• Types of IV fluids</li> <li>• Fluid overload</li> <li>• Hyponatremia</li> <li>• Hypernatremia</li> <li>• Hypokalemia</li> <li>• Hyperkalemia</li> <li>• Hypocalcemia</li> <li>• Hypercalcemia</li> <li>• Hypomagnesemia</li> <li>• Hypermagnesemia</li> </ul>	10 Hours
3	<b>Hematological Emergencies</b> <ul style="list-style-type: none"> <li>• Iron Deficiency Anaemia</li> <li>• Hemolytic Anaemia</li> <li>• Megaloblastic Anaemia</li> <li>• Polycythemia vera</li> <li>• Thalassemia</li> <li>• Leukemia</li> <li>• Sickle cell disease</li> <li>• Thrombotic Thrombocytopenic Purpura (TTP)</li> <li>• Disseminated Intravascular Coagulation (DIC)</li> <li>• Massive Transfusion Protocol</li> </ul>	10 Hours
4	<b>Oncological Emergency</b> Malignancy-induced <ul style="list-style-type: none"> <li>• Hypercalcemia</li> <li>• Superior Vena Cava Syndrome</li> <li>• Cord Compression</li> <li>• Intracranial Pressure</li> <li>• Syndrome of Inappropriate Anti-Diuretic Hormone</li> <li>• Tumor Lysis Syndrome</li> <li>• Febrile Neutropenia</li> </ul>	8 Hours
5	<b>Psychiatric Emergencies</b> <ul style="list-style-type: none"> <li>• Delirium and delirium</li> <li>• Violent or aggressive behavior</li> <li>• Anxiety or panic attack</li> <li>• Acute Psychosis</li> <li>• Schizophrenia</li> <li>• Withdrawal syndrome</li> </ul>	7 Hours

Unit	Topic	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• ABG Interpretation</li> <li>• Blood Investigations</li> <li>• Fluid Administration</li> </ul>	30 Hours
	<b>Total</b>	<b>75 Hours</b>

**Reference textbooks:**

- Clinical Procedures in Emergency Medicine – Roberts and Hedges
- Tintinalli’s Emergency Medicine: A Comprehensive Study Guide
- Emergency Procedures: A Handbook for Medical Professionals – Oxford University Press
- The ICU Book – Paul L. Marino (Ventilation, Mechanical support, and advanced procedures)

**2. Trauma Emergencies: Part-2**

CL	CP	L	P
3	1	45	30

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or equivalent with experience.

**Course Description**

This course focuses on the assessment and management of musculoskeletal injury during trauma. It includes hands-on training in the spinal motion restriction & immobilization, and splinting of musculoskeletal emergencies in a pre-hospital setting.

**Learning Objectives**

By the end of this course, students will be able to:

- Describe the anatomy of the musculoskeletal system.
- Recognize musculoskeletal injuries.
- Spinal Motion Restriction.
- Practice immobilization and prevent complications.

## Course Plan

Units	Topics	Hours
1	<b>Introduction to Musculoskeletal Injury</b> <ul style="list-style-type: none"> <li>Fracture and types of fracture</li> <li>Subluxation and dislocation</li> <li>Fracture Healing and complications of fracture</li> </ul>	3 Hours
2	<b>Pelvic Trauma</b> <ul style="list-style-type: none"> <li>Anatomy and physiology of pelvis</li> <li>Mechanism of injury, assessment and management of pelvic injury</li> <li>Pelvic Dislocation</li> </ul>	2 Hours
3	<b>Spinal Injury</b> <ul style="list-style-type: none"> <li>Anatomy and physiology of spinal cord</li> <li>Mechanism of injury, assessment and management of spinal bone injury</li> <li>Mechanism of injury, assessment and management of the spinal cord</li> </ul>	2 Hours
4	<b>Upper Extremity Injury</b> <ol style="list-style-type: none"> <li>Anatomy and range of motion of the upper extremity</li> <li>Injury around the shoulder <ul style="list-style-type: none"> <li>Cervical fracture</li> <li>Fracture of the scapula</li> <li>Shoulder dislocation</li> </ul> </li> <li>Injury to the Arm <ul style="list-style-type: none"> <li>Proximal humerus fracture</li> <li>Shaft of humerus fracture</li> <li>Distal Humerus Fracture</li> </ul> </li> <li>Injury around the elbow <ul style="list-style-type: none"> <li>Supracondylar fracture</li> <li>Elbow dislocation</li> </ul> </li> <li>Injury to the forearm <ul style="list-style-type: none"> <li>Both bone fractures of the forearm</li> <li>Monteggia's fracture</li> <li>Galeazzi's fracture</li> <li>Smith and Barton fractur</li> </ul> </li> <li>Wrist Injury</li> <li>Hand Injury</li> </ol>	18 Hours

Units	Topics	Hours
<b>5</b>	<b>Lower Extremity Injury</b> 1. Anatomy and range of motion of the lower extremity 2. Femur Fracture <ul style="list-style-type: none"> <li>• Head of femur fracture</li> <li>• Neck of femur</li> <li>• Shaft of femur fracture</li> <li>• Distal/supracondylar fracture</li> </ul> 3. Injury to the Knee <ul style="list-style-type: none"> <li>• Patella fracture</li> <li>• Knee dislocation</li> </ul> 4. Tibia and fibula fracture 5. Ankle injury 6. Achilles Tendon Injury 7. Foot Injury	18 Hours
<b>6</b>	<b>Special Musculoskeletal injury</b> 1. Crush Injury 2. Amputation	2 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	1. Cervical collar 2. Spine motion restriction devices 3. Pelvic binder 4. Splinting techniques 5. Plaster of Paris	30 Hours
	<b>Total</b>	<b>75 Hours</b>

**Reference textbooks:**

- Advanced Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT, 2022)
- Prehospital Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT)
- Textbook of Orthopedics, 5<sup>th</sup> edition, John Ebinezer.
- Textbook of orthopedics and traumatology, Mayil Vahanan Natarajan
- Nancy Caroline's Emergency Care in Street, 8<sup>th</sup> Edition

### 3. Burns

CL	CP	L	P
3	1	45	30

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic Equivalent with experience.

#### Course Description

This course provides foundational and advanced knowledge in the assessment, management, and rehabilitation of patients with burn injuries. This course covers key concepts of burn pathophysiology, classification, resuscitation, wound care, infection control, pain management, and psychological support.

#### Learning Objectives

By the end of this course, students will be able to:

- Understand the classification and pathophysiology of burns.
- Perform initial assessment and fluid resuscitation in burns.
- Able to provide pain management and appropriate burn care.
- Psychological support for the burn patients.
- Know the special care and manage the special population

Units	Topics	Hours
1	<b>Introduction to burns care</b> <ul style="list-style-type: none"> <li>• Anatomy of the skin and its function</li> <li>• Types of burns</li> <li>• Degrees of burns</li> <li>• Pathophysiology of burns, shock, and burn oedema</li> <li>• Burn Resuscitation</li> <li>• Pain management</li> </ul>	8 Hours
2	<b>Scar Assessment, Treatment, and Rehabilitation</b> <ul style="list-style-type: none"> <li>• Scar Assessment</li> <li>• Burns scar treatment/debridement</li> <li>• Rehabilitation of scar management</li> </ul>	5 Hours
3	<b>Non-Thermal Burns</b> <ul style="list-style-type: none"> <li>• Chemical burns</li> <li>• Electrical Burns</li> <li>• Radiational Burns</li> <li>• Frostbite</li> <li>• Inhalation burns</li> </ul>	8 Hours

Units	Topics	Hours
4	<b>Burn Reconstruction Principles</b> <ul style="list-style-type: none"> <li>Principles of burn reconstruction</li> <li>Tissue expander in burns</li> <li>Reconstruction – skin substitute and tissue engineering</li> </ul>	8 Hours
5	<b>Specialized Burns</b> <ul style="list-style-type: none"> <li>Pediatric burns</li> <li>Geriatric Burns</li> <li>Burns in Pregnancy</li> <li>Eye and hand burns</li> </ul>	8 Hours
6	<b>Critical Care and acute phase after burns</b> <ul style="list-style-type: none"> <li>Wound Care in Infectious Burns</li> <li>Nutritional support for a burn patient</li> <li>Psychological support in the acute phase of hospitalization</li> <li>Rehabilitation in the acute phase</li> </ul>	8 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Burn assessment – total body surface area burns</li> <li>Fluid calculation in adult and pediatric</li> <li>Wound debridement and dressing material</li> <li>Airway Management</li> <li>Escharotomy or fasciotomy skills</li> </ul>	30 Hours
<b>Total</b>		<b>75 Hours</b>

**Reference Textbooks:**

- Handbook of Burns, Volume 1, Acute Burn Care,
- Handbook of burns, volume 2, Reconstruction and Rehabilitation
- Total Burn Care, by Davind N. Herndon, 5<sup>th</sup> Edition.

**4. Surgical Emergencies**

CL	CP	L	P
3	1	45	30

**Instructors in charge:**

Bachelor of Emergency Medical Technologist (Paramedic)  
 Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description**

This course provides a comprehensive overview of the diagnosis, assessment, and initial management of surgical emergencies commonly encountered in emergency departments and acute care settings.

## Learning Objectives

By the end of this course, students will be able to:

- Identify and prioritize life-threatening surgical conditions.
- Perform systematic evaluation and initiate resuscitation in surgical emergencies.
- Interpret relevant diagnostic tests and imaging.
- Implement initial management and procedural interventions.

## Course Plan

Units	Topics	Hours
1	<b>Principles of anaesthesia</b> <ul style="list-style-type: none"><li>• Pre-anaesthetic Assessment</li><li>• Airway Management</li><li>• General Anaesthesia</li><li>• Local Anaesthesia</li><li>• Regional Anaesthesia</li></ul>	8 Hours
2	<b>Wounds</b> <ul style="list-style-type: none"><li>• Types of wounds and wound management</li><li>• Wound healing</li><li>• Suturing</li><li>• Tetanus</li><li>• Gas gangrene</li></ul>	10 Hours
3	<b>Abdominal and Gastrointestinal Emergencies</b> <ol style="list-style-type: none"><li>1. Acute abdominal pain</li><li>2. Oesophageal emergencies<ul style="list-style-type: none"><li>• Gastro-oesophageal reflux disease</li><li>• Oesophageal obstruction</li></ul></li><li>3. Gastrointestinal bleeding<ul style="list-style-type: none"><li>• Upper GI Bleeding</li><li>• Lower GI Bleeding</li></ul></li><li>4. Stomach and Duodenum<ul style="list-style-type: none"><li>• Peptic ulcer</li><li>• Duodenal ulcer</li></ul></li><li>5. Abdominal Aortic Aneurysm</li><li>6. Appendicitis</li><li>7. Pancreatitis</li><li>8. Cholecystitis</li><li>9. Intestinal obstruction</li><li>10. Intestinal perforation Hernias</li></ol>	20 Hours

Units	Topics	Hours
4	<b>Genitourinary System</b> <ul style="list-style-type: none"> <li>Renal Colic</li> <li>Ureteric colic</li> <li>Torsion of the testis</li> </ul>	4 Hours
5	<b>Anorectal Disorders</b> <ul style="list-style-type: none"> <li>Rectal Prolapse</li> <li>Haemorrhoids</li> </ul>	3 Hours
<b>Practical Skills</b> (lab/clinical/ simulation)	<ul style="list-style-type: none"> <li>Suturing</li> <li>Tracheostomy</li> <li>Surgical Cricothyroidotomy</li> <li>Needle Cricothyrotomy</li> <li>Needle thoracocentesis</li> <li>Intercostal drainage</li> </ul>	30 Hours
<b>Total</b>		<b>75 Hours</b>

**Reference textbooks:**

- Manipal Manual of Surgery, 5<sup>th</sup> Edition, K Rajagopal Shenoy
- SRB manual of surgery, 6<sup>th</sup> Edition, Sriram Bhat M
- Tintinalli's Emergency Medicine, 9<sup>th</sup> Edition

## 5. Introduction and Application of Artificial Intelligence in Healthcare

CL	CP	L	P
1	1	15	15

**Instructors in charge:** Master's Degree in a relevant discipline or Equivalent with experience.

### Course Description

This course provides a foundational understanding of Artificial Intelligence (AI) and its transformative applications in healthcare. Learners will explore how AI technologies are applied to clinical diagnostics, decision support systems, medical imaging, personalized medicine, patient monitoring, and administrative tasks.

### Learning Objectives

By the end of this course, students will be able to:

- Understand the fundamentals of AI and machine learning.
- Identify and analyze key areas where AI is applied in healthcare.
- Evaluate real-world use cases of AI in diagnostics, imaging, and patient care.
- Understand the regulatory, ethical, and privacy issues surrounding AI in healthcare.

## Course Plan

Units	Topics	Hours
<b>Unit 1: Introduction to Artificial Intelligence in Health Care</b>	<ol style="list-style-type: none"> <li>1. Define Artificial Intelligence and current practice</li> <li>2. New age health care</li> <li>3. Artificial intelligence and health records</li> </ol>	5 Hours
<b>Unit 2: Data in Health Care</b>	<ol style="list-style-type: none"> <li>1. Introduction to data and types of data</li> <li>2. Health care data</li> <li>3. Challenges in data</li> <li>4. Data privacy</li> </ol>	5 Hours
<b>Unit 3: Machine Learning</b>	<ol style="list-style-type: none"> <li>1. Basics of Machine Learning</li> <li>2. Difference between machine learning Vs software engineering</li> <li>3. How machine learning will work</li> <li>4. Deep learning</li> <li>5. Neural network</li> <li>6. Algorithm</li> </ol>	8 Hours
<b>Unit 4: Application of Artificial Intelligence in Health Care</b>	<ol style="list-style-type: none"> <li>1. Drug Discovery and molecular modeling using Artificial Intelligence</li> <li>2. Drug delivery and pharmaceutical development</li> <li>3. Cancer Diagnosis and treatment decision</li> <li>4. Artificial Intelligence in Medical Imaging</li> <li>5. Artificial Intelligence-assisted surgery</li> <li>6. Medical devices</li> </ol>	8 Hours
<b>Unit 5: Ethics, Bias and Regulation</b>	<ol style="list-style-type: none"> <li>1. Ethical Considerations in Artificial Intelligence and Machine Learning</li> <li>2. Bias Using Artificial Intelligence in Health Care</li> <li>3. Regulation and legal framework</li> </ol>	4 Hours
<b>Total</b>		<b>30 Hours</b>

### Reference textbooks:

- Artificial Intelligence in Healthcare – Adam Bohr & Kaveh Memarzadeh
- Machine Learning and AI for Healthcare: Big Data for Improved Health Outcomes – Arjun Panesar
- Artificial Intelligence and Deep Learning in Pathology – Stanley Cohen

## 6. Healthcare Management, Personality Development, Leadership, Human Rights

CL	CP	L	P
2	0	30	0

**Instructors in charge:** Master's Degree in a relevant discipline or Equivalent with experience

**Course Description** This course equips healthcare professionals with the skills to lead effectively, enhance their personality, and uphold human rights in healthcare settings. The interdisciplinary content merges management principles, self-development techniques, and rights-based healthcare approaches to improve individual effectiveness and institutional culture.

### Learning Objectives

By the end of this course, students will be able to

- Enhance the Interpersonal and Leadership skills.
- Learn the personality development and the principles of professional growth.
- Learn the system in health care setting.
- Human right in the health practice

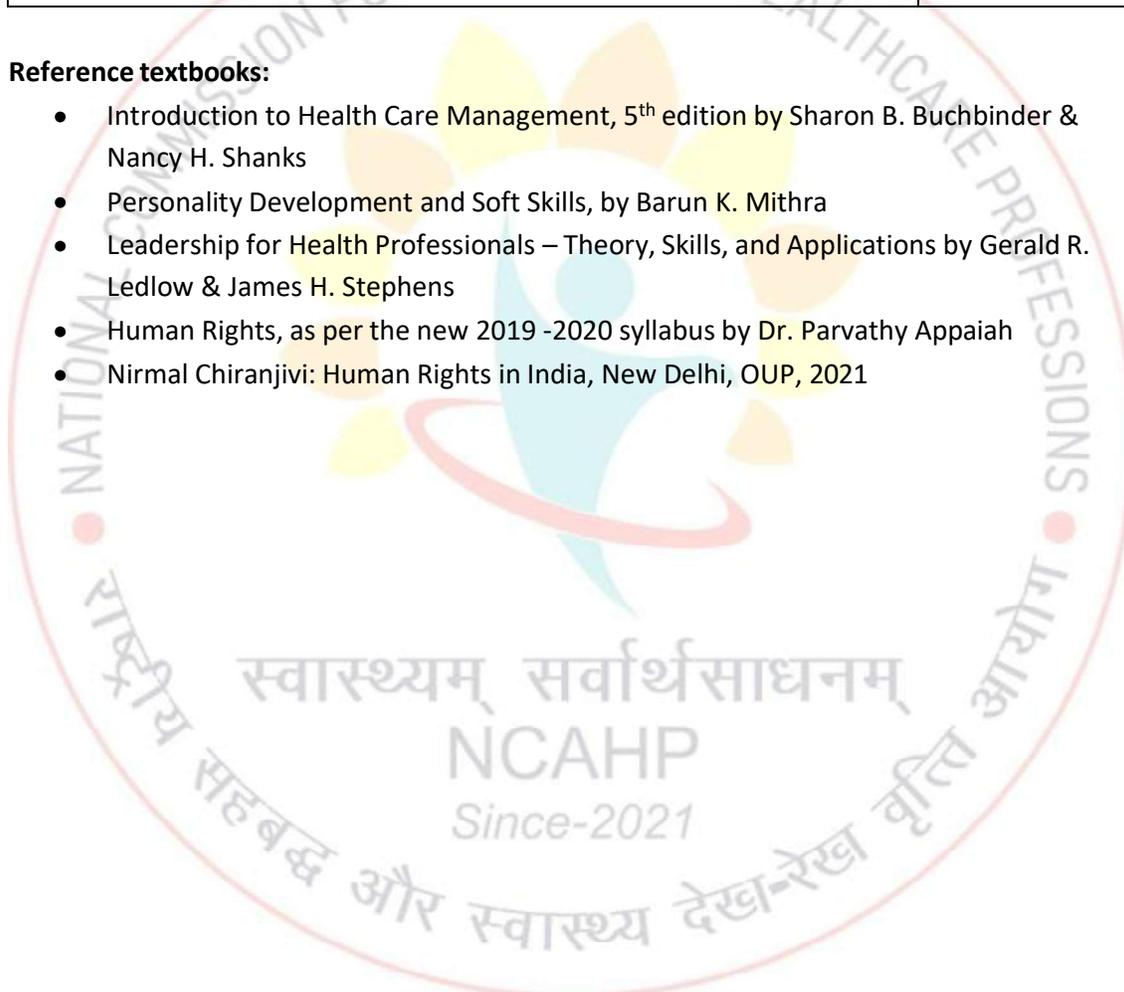
### Course Plan

Units	Topics	Hours
<b>Unit 1: Health Care Management</b>	<ol style="list-style-type: none"> <li>1. Introduction to Health Care Management</li> <li>2. Law and ethics in health care management</li> <li>3. Health care regulation and compliance</li> <li>4. Emerging issue in Health Care Management</li> </ol>	7 Hours
<b>Unit 2: Personality Development</b>	<ol style="list-style-type: none"> <li>1. Introduction to personality development</li> <li>2. Soft skills</li> <li>3. Communication skills</li> <li>4. Group discussion</li> <li>5. Job interview</li> <li>6. Body language</li> </ol>	8 Hours
<b>Unit 3: Leadership</b>	<ol style="list-style-type: none"> <li>1. Leadership thoughts</li> <li>2. Leadership style</li> <li>3. Health leadership challenges</li> <li>4. Leadership Competencies</li> <li>5. Ethical responsibility in health leadership</li> </ol>	7 Hours

Units	Topics	Hours
<b>Unit 4: Human Rights</b>	1. Human Rights meaning 2. Universal Declaration of Human Rights 3. Global advocacy of human rights, Amnesty International and other organization 4. People's Union for Civil Liberty 5. Human Rights Commission in India 6. Remedies Against Violation of Human Rights in India	8 Hours
<b>Total</b>		<b>30 Hours</b>

**Reference textbooks:**

- Introduction to Health Care Management, 5<sup>th</sup> edition by Sharon B. Buchbinder & Nancy H. Shanks
- Personality Development and Soft Skills, by Barun K. Mithra
- Leadership for Health Professionals – Theory, Skills, and Applications by Gerald R. Ledlow & James H. Stephens
- Human Rights, as per the new 2019 -2020 syllabus by Dr. Parvathy Appaiah
- Nirmal Chiranjivi: Human Rights in India, New Delhi, OUP, 2021



## Fifth Semester

### 1. Toxicological & Environmental Emergencies

CL	CP	L	P
3	1	45	30

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

#### Course Description

This course introduces students to the recognition, assessment, and pre-hospital management of toxicological and environmental emergencies. It emphasizes early identification, decontamination, antidote use, and the EMS provider's role in mass casualty and hazardous situations.

#### Learning Objectives

By the end of this course, students will be able to:

- Identify and explain common poisons and how they affect the body.
- Decide how to treat different poisonings using antidotes and decontamination.
- Recognize patterns (toxidrome) to figure out the type of poisoning.
- Perform basic emergency care for toxic and environmental emergencies.
- Plan how to respond to large-scale chemical or environmental incidents

#### Course Plan

Units	Topics	Hours
1	<b>Principles of Toxicology</b> Pre-hospital Toxicology Assessment, Scene Safety and Hazard Identification, Routes of exposure: Inhalation, ingestion, dermal, Toxicokinetics: absorption, distribution, metabolism, excretion, Toxicodynamic: cellular effects, organ- specific toxicity, Common Toxidromes, Chemical Exposure and Hazmat Response, General management of Poisoning, Decontamination techniques, Gastric lavage, activated charcoal, Whole bowel irrigation, Emergency antidotes, Legal and Ethical Aspects of Poisoning Cases, Poison Control Center Coordination, Transport and Isolation of Contaminated Patients, Use of PPE in Toxic Exposure Scenarios	15

Units	Topics	Hours
2	<b>Common Toxic Emergencies</b> Organophosphate and Pesticide Poisoning, Opioid overdose, Cardiac Glycoside Toxicity, Acetaminophen / Salicylate overdose, Tricyclic antidepressant overdose, Heavy Metal poisoning, Alcohol toxicity: methanol vs ethanol, Sedatives - Hypnotics overdose, Carbon Monoxide toxicity, Hydrocarbon toxicity, Cyanide Poisoning, Beta-blocker and Calcium Channel Blocker overdose, Sulfonamides and Insulin Overdose (Hypoglycemia), Methemoglobinemia, Serotonin Syndrome, Sodium Channel Blocker Toxicity, Recreational Drug Toxicity (e.g., cocaine, MDMA, synthetic cannabis), Caustic Ingestion (acids and alkali), Food Poisoning and Botulism	15
3	<b>Environmental Emergencies</b> Insect Bites / Stings - Bee and wasp, Spider, Snakebite and Scorpion Envenomation: antivenom protocols, Animal Bites, Plant and Mushroom Poisoning, Hyperthermia - Types, Fluid resuscitation, Hypothermia: Frost bite, rewarming methods, Drowning: airway management, hypoxia, Lightning strike, High Altitude Illness, Decompression sickness, Hazardous material / Radiation Exposure, Mass Casualty Incidents Involving Toxic Agents	15
<b>Practical Skills</b> (lab/clinical/simulation)	PPE and decontamination, Airway Management, Fluid Resuscitation, Antidote administration, Ryle's tube insertion, Gastric Lavage	30
<b>Total</b>		<b>75 Hours</b>

**Reference textbooks:**

- Goldfrank's Toxicologic Emergencies, 12th Ed. (2023) – Robert S. Hoffman
- Emergency Toxicology: A Comprehensive Clinical Guide (2022) – Frank Paloucek et al.
- Rosen's Emergency Medicine: Concepts and Clinical Practice, 10th Ed. (2023)
- Textbook of Medical Toxicology – Dr. V.V. Pillay, 3rd Ed. (2021)
- Forensic Medicine & Toxicology – Dr. Anil Aggrawal
- Essentials of Forensic Medicine & Toxicology – K.S. Narayan Reddy

## 2. Gynaecological & Obstetric Emergencies

CL	CP	L	P
3	1	45	30

### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

### Course Description

This course focuses on acute gynecological and obstetric conditions requiring emergency care, including childbirth and maternal complications. It includes hands-on simulations of obstetric interventions, hemorrhage control, EMS management of female reproductive emergencies and pre-hospital childbirth.

### Learning Objectives

By the end of this course, students will be able to

- Describe the female reproductive system and pregnancy changes.
- Recognize and manage emergency situations in pregnant women.
- Assist safely in normal deliveries in pre-hospital settings.
- Handle complications like bleeding, breech delivery, or eclampsia.
- Practice childbirth drills and know when to refer to a hospital.

### Course Plan

Units	Topics	Hours
1	<b>Obstetric Emergencies and Antenatal Care</b> Anatomy of the Female Reproductive System, Menstrual Cycle Phases -Follicular Phase, Ovulatory Phase, Luteal Phase, Hormonal Regulation in Reproductive Cycle, Maternal Adaptations in Pregnancy, Antenatal Assessment - History and Physical Examination, Ultrasound and Lab Investigations Abortion, Hypertensive Emergencies in Pregnancy-Gestational Hypertension, Severe Pre-eclampsia, Eclampsia, Antepartum Hemorrhage - Placenta Previa, Abruptio Placentae, Amniotic Fluid Embolism, Preterm Labor and PROM (Premature Rupture of Membranes), Cardiac Complications in Pregnancy -Congenital Heart Disease, Peripartum Cardiomyopathy	15

Units	Topics	Hours
2	<b>Emergency Childbirth (Field Deliveries)</b> Expected Vaginal Delivery in an Ambulance, Postpartum Hemorrhage (PPH), Uterine Rupture, Breech Presentation, Shoulder Dystocia, Multiple Gestation Delivery, Cord Prolapse, Trauma in Pregnancy, Assisted Vaginal Delivery (Forceps/Vacuum), Perimortem Caesarean Section, Cardiopulmonary Arrest in Pregnancy, Neonatal Assessment, Neonatal Resuscitation and Stabilization, Neonatal Handover Coordination with Receiving Facility.	15
3	<b>Gynaecological Emergencies</b> Ectopic Pregnancy, Pelvic Inflammatory Disease (PID), Acute Endometriosis Flare, Pelvic Mass with Acute Pain, Urinary Retention or Incontinence Related to Gynaecologic Conditions, Acute Abdominal Pain of Gynaecologic Origin, Ovarian Torsion, Ruptured Ovarian Cyst, Menorrhagia / Dysfunctional Uterine Bleeding (DUB), Anemia-Related Emergency Stabilization, Gynecological Trauma -Road Traffic Accidents (RTA), Sexual Assault, Sexual Assault and Forensic Evidence Preservation, EMS Role in Early Pregnancy Loss and Emotional Support, Psycho social Emergencies Related to Reproductive Health	15
<b>Practical Skills</b> (lab/clinical /simulation)	Antenatal assessment & Normal Delivery PPH simulation with uterine massage + uterotonics Obstetric drills: breech, eclampsia, dystocia, twin delivery	30
<b>Total</b>	स्वास्थ्यम् सर्वार्थसाधनम्	<b>75 Hours</b>

**Reference textbooks:**

- Advanced Medical Life Support (AMLS) Provider Manual, 4th Ed. (NAEMT, 2022)
- Clinical Obstetrics and Gynecology, 5th Ed. (2022) – Brian A. Magowan
- Emergency Care in Obstetrics and Gynecology (2023) – Joseph S. Sanfilippo et al.
- DC Dutta's Textbook of Obstetrics – Hiralal Konar| 10th Ed. (2023)
- Manual of Obstetrics – Shirish N Daftary & Narendra Malhotra

### 3. Neonatology and Pediatrics

CL	CP	L	P
3	1	45	30

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

#### Course Description

This course explores emergency care principles for neonates and children, focusing on age-specific assessment, vital signs, trauma, infectious diseases, and resuscitation protocols. Pediatric Advanced Life Support (PALS) and Neonatal Resuscitation foundation techniques are emphasized.

#### Learning Objectives

By the end of this course, students will be able to

- Understand how babies and children are different from adults in emergencies.
- Assess and manage breathing, circulation, and consciousness in children.
- Follow newborn and pediatric resuscitation steps (PALS, NRP).
- Identify signs of serious illness, trauma, or abuse in children.
- Plan emergency care based on the child's age and condition.

#### Course Plan

Units	Topics	Hours
1	<b>Neonatal Emergencies</b> Fetal Circulation, Intrapartum Fetal Surveillance, Neonatal Reflexes, Neonatal Thermoregulation, Assessment of the Newborn, Neonatal Resuscitation -APGAR Scoring Protocol, Birth Asphyxia -Oxygen Therapy, CPAP, Neonatal Jaundice - Phototherapy, Neonatal Sepsis -Blood Cultures, Antibiotic Therapy, Birth Trauma, Meconium Aspiration Syndrome, Neonatal Hypoglycemia, Neonatal Hypothermia, Neonatal Seizures, Congenital Diaphragmatic Hernia (CDH), Congenital Heart Disease Presenting in Neonates, Umbilical Cord Prolapse or Bleeding, Neonatal Transport Considerations.	15

Units	Topics	Hours
2	<b>Pediatric Assessment</b> Developmental Milestones: motor, language, psycho-social, Anatomical and Physiological differences, Pediatric vital signs and weight based dosing, Pediatric assessment triangle, Pediatric Glasgow coma scale, Congenital anomalies, Immunization schedules, Pediatric Pain Management in EMS, Transport Considerations for Critically Ill Children, Airway Management in Children, Pediatric Oxygen Therapy and Delivery Devices Non-Accidental Trauma (Child Abuse) - Identification and reporting of child abuse, Handling Children with Special Healthcare Needs, Communication Strategies with Pediatric Patients and Families, Documentation and Legal Considerations in Pediatric EMS, Infection Control and PPE Use in Pediatric Emergencies	15
3	<b>Pediatric Emergencies</b> Choking and Foreign Body Aspiration, Upper Airway Obstruction (e.g., Croup, Epiglottitis), Asthma Exacerbation, Acute Allergic Reaction, Anaphylaxis, Pneumonia, Bronchiolitis, Dehydration in Children, Shock (Hypovolemic, Septic, Anaphylactic), Meningitis, Sepsis, Febrile Seizures, Diabetic Ketoacidosis (DKA), Pediatric Trauma-Head Injury, fractures, Drowning and Near-Drowning, Burns, Status Epilepticus, Poisoning and Toxic Ingestion, Sudden Infant Death Syndrome (SIDS), Congenital Heart Disease Emergencies, Apnoea in Infants, Electrolyte Imbalances, Pediatric Cardiac Arrest and CPR, Heat Stroke and Hypothermia	15
<b>Practical Skills</b> (lab/clinical/simulation)	Pediatric airway management and intubation, Pediatric Fluid Dose calculation, Pediatric Advanced Life Support (PALS) algorithms, Neonatal Assessment, Neonatal Resuscitation (NRP)	30
<b>Total</b>		<b>75 Hours</b>

**Reference textbooks:**

- Pediatric Advanced Life Support (PALS) Manual, AHA 2020 Guidelines + 2025 Updates
- Pediatric Emergency Medicine, 2nd Ed. (2023) – Gary R. Strange
- Advanced Pediatric Assessment, 4th Ed. (2022) IAP Textbook of Pediatrics Aparna Sharma / A Parthasarathy (IAP Editors)
- AIIMS Protocols in Neonatology – Dr. Vinod K Paul

#### 4. Clinical Pharmacology – Emergency Medications

CL	CP	L	P
2	1	30	30

**Instructors in charge:** MD Pharmacology / PhD Pharmacology / M.Pharm or Pharm D who have adequate experience in teaching pharmacology

#### Course Description

This course provides foundational pharmacological knowledge for emergency medical providers. Students learn the action, indication, dosing, side effects, and legal aspects of medications used in EMS practice.

#### Learning Objectives

By the end of this course, students will be able to

- List emergency drugs and explain what they are used for.
- Calculate correct drug doses for adults and children.
- Choose the right medicine based on the patient's condition.
- Give emergency medicines safely and watch for side effects.
- Know what medicines are in an EMS drug kit and how to use them

#### Course Plan

Units	Topics	Hours
1	<b>Cardiovascular &amp; Resuscitation Medications</b> Vasopressors & Inotropes-Epinephrine Dopamine, Norepinephrine, Vasopressin, Antiarrhythmic - Amiodarone, Lidocaine, Adenosine Bradycardia Management- Atropine, Cardiac Ischemia - Aspirin, Nitroglycerin Fluid resuscitation - Indications, Types of Fluids, Fluid Administration Strategy, Fluid Responsiveness, Special considerations, Complications.	10
2	<b>Respiratory, Neurological &amp; Metabolic Medications</b> Respiratory Agents -Albuterol, Ipratropium Magnesium Sulfate Sedatives & Anticonvulsants -Midazolam, Diazepam, Ketamine Hypoglycemia Management -Dextrose, Glucagon Electrolyte & Acid-Base Management Calcium Chloride, Sodium Bicarbonate, Potassium chloride	10

Units	Topics	Hours
3	<b>Toxicology, Pain &amp; Anaphylaxis Medications</b> Antidotes & Adsorbents - Naloxone, Activated Charcoal, Acetylcysteine (NAC), Pain Management - Morphine, Fentanyl Anaphylaxis & Allergic Reactions- Epinephrine (IM), Diphenhydramine Methylprednisolone, Hydrocortisone Drugs used in Obstetrics –Oxytocin, Tocolytic agents	10
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• EMS Drug Kit Essentials</li> <li>• Drug formulary and identification Route of administration</li> <li>• Appropriate dosage administration using practice medications</li> <li>• Infusion protocols: IV drip rate calculation</li> </ul>	30
<b>Total</b>		<b>60 Hours</b>

#### Reference textbooks:

- Basic and Clinical Pharmacology, 16th Ed. (2023) – Bertram Katzung
- Textbook of Pharmacology for Paramedical Students – S.P. Bhargava
- Mosby’s Paramedic Textbook, 5th Ed. (2023) – Mick J. Sanders
- EMS Medication Field Guide, 2024 Ed. – Jones & Bartlett Learning
- Essentials of Medical Pharmacology – K.D. Tripathi| 8th Ed. (2022)

### 5. Basics of Radiology & Imaging Interpretation

CL	CP	L	P
2	1	30	30

**Instructors in charge:** MD Pharmacology / PhD Pharmacology / M.Pharm or Pharm D who have adequate experience in teaching pharmacology

#### Course Description

Students will gain a foundational understanding of diagnostic imaging in the emergency setting. This course focuses on interpreting X-rays, CT scans, and point-of-care ultrasound (POCUS) for trauma and medical emergencies.

#### Learning Objectives

By the end of this course, students will be able to

- Understand different types of medical imaging (X-ray, CT, Ultrasound).
- Spot common injuries or conditions on emergency scans.
- Use ultrasound to check lungs, heart, and bleeding in trauma.
- Make quick image-based decisions in emergencies.
- Record and report your findings clearly for handovers.

## Course Plan

Units	Topics	Hours
1	<b>X-ray (Radiography)</b> Principles of X-ray imaging: How X-rays are generated and interact with tissues, Common views in trauma: Chest, pelvis, cervical spine, extremities, Portable X-ray in EMS: Use in ambulances or field hospitals. Radiographic signs of emergencies: Pneumothorax, Fractures, Foreign bodies, Pulmonary edema	10
2	<b>CT Scan (Computed Tomography)/ MRI (Magnetic Resonance Imaging)</b> CT basics: Cross-sectional imaging, contrast use, Trauma CT protocols: Head, chest, abdomen/pelvis. MRI (Magnetic Resonance Imaging) basics: Magnetic fields and radio waves, Limitations in EMS: Time, availability, contraindications, Emergency indications Spinal cord injury, Stroke (diffusion-weighted imaging), Soft tissue evaluation	10
3	<b>Ultrasound (Sonography)</b> Point-of-care ultrasound (POCUS): Bedside use in EMS.FAST exam: Focused Assessment with Sonography for Trauma, Lung ultrasound: Pneumothorax, pleural effusion, Cardiac ultrasound: Pericardial effusion, tamponade, Vascular access guidance, FAST vs CT in trauma: Emergency findings: Intracranial hemorrhage, Solid organ injury, Aortic dissection, Pulmonary embolism	10
<b>Practical Skills</b> (lab/clinical/ simulation)	X-ray Interpretation Skills Point-of-Care Ultrasound (POCUS) Skills CT Scan Recognition and Relevance Image-based EMS Decision Making Communication and Documentation of Imaging Findings Simulation and Case-based Image Interpretation Practice	30
<b>Total</b>		<b>60 Hours</b>

### Reference textbooks:

- Felson's Principles of Chest Roentgenology, 5th Ed. (2022) – Lawrence Goodman
- Emergency Radiology: The Requisites, 3rd Ed. (2023) – Jorge A. Soto
- Introduction to Bedside Ultrasound, 2nd Ed. – Mike Stone (Free via One Minute Ultrasound App)
- Textbook of Radiology and Imaging – David Sutton, Indian Adaptation by Anil T Ahuja
- Fundamentals of Diagnostic Radiology – Subhash Chandra Parija (Editor)
- Manual of Radiographic Positioning – Sushil Kachewar

## 6. Telemedicine

CL	CP	L	P
2	1	30	30

**Instructors in charge:** Master's Degree in a relevant discipline or Equivalent with experience

### Course Description

This course introduces students to telemedicine's role in EMS, covering its platforms, legal frameworks, tele-triage, remote guidance, and integration with emergency dispatch and clinical decision-making systems.

### Learning Objectives

By the end of this course, students will be able to

- Explain how telemedicine helps in emergencies and rural areas.
- Use telehealth tools to communicate with doctors during calls.
- Follow rules for patient privacy and consent in tele-consultations.
- Practice doing remote assessments and sending vital signs.

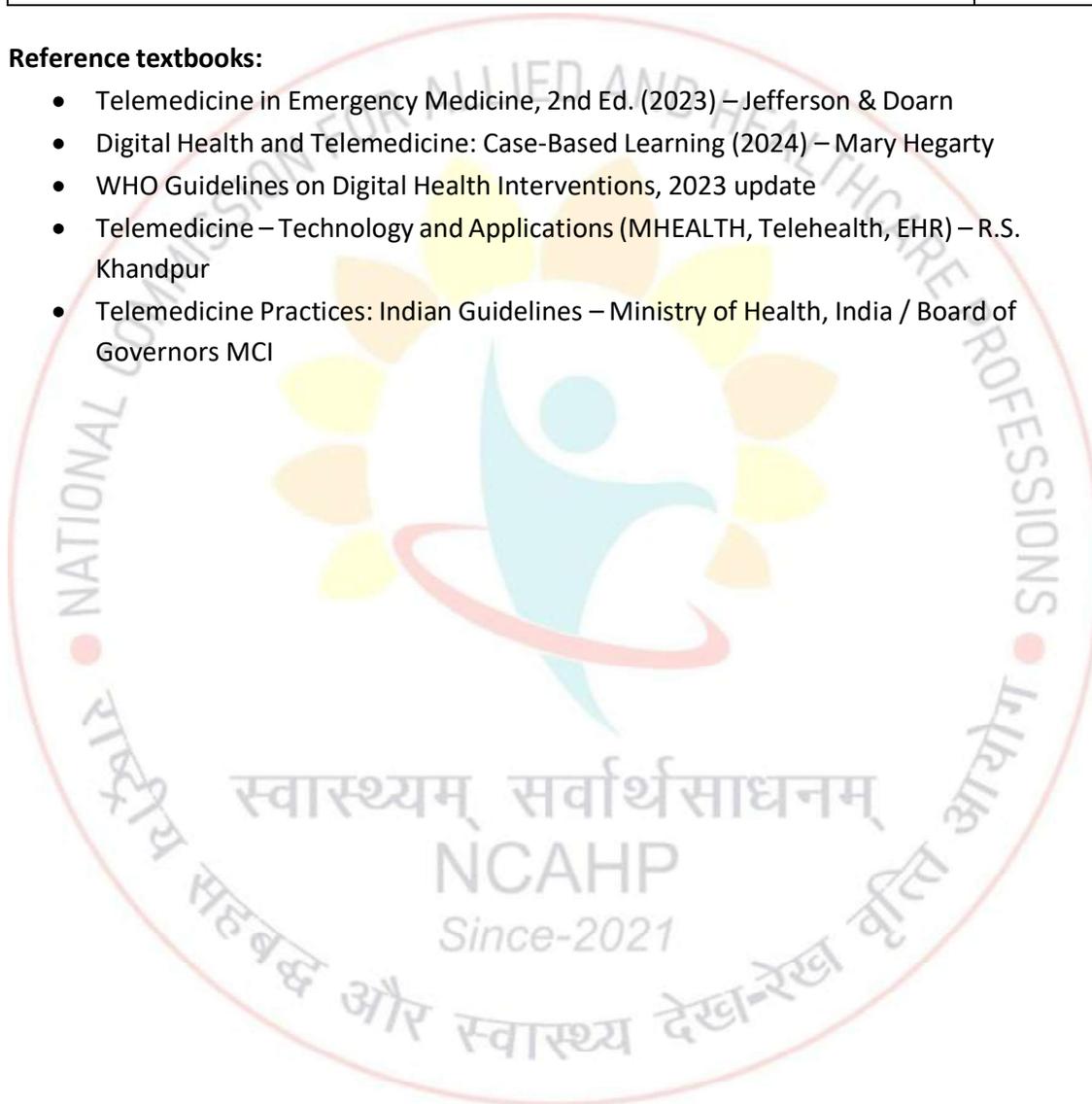
### Course Plan

Units	Topics	Hours
1	<b>Telemedicine Foundations</b> History and evolution of telehealth Platforms: video conferencing, mobile apps Tele-triage protocols Remote monitoring (Pandemic situations)	10
2	<b>Legal and Ethical Aspects</b> Data privacy: HIPAA, Indian IT Act Consent and documentation Medico-legal and ethical liability Cross-border consultations	10
3	<b>Telemedicine in Practice</b> Rural health outreach via mobile vans Disaster response: remote triage Integration with EMR and PACS 104 Health Helpline Process Introduction to technology and Artificial intelligence in health care systems	10

Units	Topics	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• Telemedicine – Roles, equipments</li> <li>• How to advice to callers by algorithm based applications</li> <li>• Use of Telemetry - transferring data to the receiving facility</li> <li>• e.g. ECG, Vital trends</li> <li>• Simulation: Mock calls - teleconsultation</li> </ul>	30
<b>Total</b>		<b>60Hours</b>

**Reference textbooks:**

- Telemedicine in Emergency Medicine, 2nd Ed. (2023) – Jefferson & Doarn
- Digital Health and Telemedicine: Case-Based Learning (2024) – Mary Hegarty
- WHO Guidelines on Digital Health Interventions, 2023 update
- Telemedicine – Technology and Applications (MHEALTH, Telehealth, EHR) – R.S. Khandpur
- Telemedicine Practices: Indian Guidelines – Ministry of Health, India / Board of Governors MCI



## Sixth Semester

### 1. Disaster and MCI Management

CL	CP	L	P
3	1	45	30

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic),
- Masters of Advance care paramedic or Equivalent with experience.

#### Course Description

This advanced-level course is designed to equip EMS paramedics with the essential knowledge, skills, and operational readiness required to respond effectively to disasters and mass casualty incidents (MCIs). The course emphasizes an all-hazards approach, integrating principles of disaster medicine, incident command, triage systems, and interagency coordination.

#### Learning Objectives

By the end of this course, students will be able to:

- Understanding the concept of triage and prioritization of care while managing multiple patients simultaneously in prehospital emergency care environment
- To assess disaster scenes, perform triage, provide field-based critical care, and coordinate with emergency services and disaster response teams.
- To understand and apply disaster preparedness principles, mass casualty incident (MCI) response, leadership during crises, and the role of prehospital care in integrated disaster systems

#### Course Plan

Unit	Topics	Hours
Unit I	<ul style="list-style-type: none"><li>▪ Disasters and Mass-Casualty Incidents (MCIs)</li><li>▪ Disaster management preparedness, planning, training, response, and after-action review</li><li>▪ Types of Disaster- Natural and Man-made.</li><li>▪ Incident command system (ICS)-Roles and Responsibilities</li><li>▪ Medical Incident Command</li><li>▪ EMS response within ICS,</li></ul>	16 Hours

Unit	Topics	Hours
	<ul style="list-style-type: none"> <li>▪ Triage               <ul style="list-style-type: none"> <li>▪ Triage principles</li> <li>▪ Overview of triage systems (START, Jump START, SALT, etc.)</li> <li>▪ Resource management</li> <li>▪ Triage</li> <li>▪ Performing</li> <li>▪ Retriage</li> <li>▪ Destination decisions</li> <li>▪ Critical Incident Stress</li> <li>▪ Management -post-traumatic and cumulative stress</li> </ul> </li> <li>• Hospital disaster preparedness and planning</li> <li>• Public health emergencies and outbreak-driven disasters</li> <li>• Urban Search and Rescue (USAR) operations</li> </ul>	
Unit II	<ul style="list-style-type: none"> <li>• Mass-Casualty Incidents Due to Terrorism and Disaster</li> <li>• Terrorism and weapons of mass destruction- Paramedic response,</li> <li>• Chemical/biological/Explosive/radiological/nuclear agents.</li> <li>• Railway accidents and derailment trauma</li> <li>• Terrorist bombing: blast injuries, scene safety, multi-casualty triage</li> <li>• Air crash disasters: triage, extrication, field stabilization</li> <li>• Maritime disasters and offshore rescue</li> <li>• Air crash disasters: triage, extrication, field stabilization</li> <li>• Tactical Emergency Medical Support (TEMS)</li> </ul>	14 Hours
Unit III	<ul style="list-style-type: none"> <li>• Hazardous material incidents – Hazardous material scene size up/scene management, identification of hazardous material, contamination and Poisoning, chemical and toxicological terminology.</li> <li>• Establishing Safety Zones</li> <li>• Personal Protective Equipment</li> <li>• Decontamination and treatment, medical monitoring and rehabilitation.</li> </ul>	09 Hours
Unit IV	<ul style="list-style-type: none"> <li>• Crime scene awareness – Awareness, highway incidents, residential incidents, violence on streets, contact and cover, self- defense, crime scenes.</li> <li>• Vehicle Extrication and Special Rescue</li> </ul>	06 Hours

Unit	Topics	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<b>Practical demonstration of</b> 1. Desk top exercises 2. Mock drill 3. Loading a patient 4. Unloading a patient 5. Techniques for patient extrication from a vehicle 6. Rescue Awareness and operations: Breaking tempered glass, 7. How to disconnect or cut battery cables in traditionally fueled and alternatively fueled vehicles 8. Stabilizing a Vehicle during Extrication 9. Stabilizing a suspected spinal injury in the water	30 Hours
	<b>Total</b>	<b>75 Hours</b>

#### Text Books

- Disaster medicine –2<sup>nd</sup> edition David E .Hogan, Jonathan-Lippincott Williams and Wilkins
- Rosens emergency medicine- Marx ,Hockberger Walls, Adams-Mosby Elsevier
- Ciottone’s Disaster Medicine, 3rd Edition – Gregory R. Ciottone

#### Reference Books

- EMS and disaster management – A holistic approach PK Dane
- Principles of Emergency Management and Emergency Operations Centers – Michael J. Fagel
- Nancy Caroline’s Emergency Care in the Streets – Latest Edition
- Disaster Response and Recovery: Strategies and Tactics for Resilience – David A. McEntire

## 2. Research Methodology and Biostatistics

CL	CP	L	P
3	-	45	-

**Instructors in charge:** Ph.D. or Masters of Advance Care Paramedic or Equivalent with experience.

#### Course Description

This foundational course introduces paramedic students to the core principles of research methodology and biostatistics, with a focus on developing the skills necessary to critically evaluate scientific literature, design research projects, and apply evidence- based practices in prehospital care.

## Learning Objectives

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.

- Understand the fundamentals of research and its role in knowledge creation.
- Identify and define research problems systematically.
- Recognize and apply ethical principles in conducting research.
- Describe and design appropriate research methodologies for different problem statements.
- Differentiate between various types of data and select suitable research tools.

## Course Plan

Unit	Topics	Hours
Unit I	Research Methodology: Introduction to research methods, Identifying research problem, Ethical issues in research, Research design, Types of Data, Research tools and Data collection methods, sampling methods, Developing a research proposal	15
Unit II	Biostatistics: Introduction, Central Limit Theorem, Measures of Morality, Sampling, Statistical significance, Correlation, Sample size determination Statistics –Collection of Data - presentation including classification and diagrammatic representation –frequency distribution. Measures of central tendency; measures of dispersion	15
Unit III	Statistical tests to compare means in normal and not normal distribution with one or more groups. Tests to check for association between groups. Use of computerized software for statistics	15
	<b>Total</b>	<b>45 Hours</b>

## Text Books

- Introduction to research Methodology: A beginners Guide to doing a research project by Uwe Flick, Sage Publications.
- Research Methodology: Methods and techniques by C. R. Kothari, New Age Publications.
- Research methodology by Ranjeet Kumar
- Research Methodology by C.R. Kothari
- Research Design by John W. Creswell
- Doing Your Research Project by Judith Bell

### 3. Intensive Care Concepts and Management

CL	CP	L	P
5	-	75	-

#### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience.

#### Course Description

This advanced-level course is designed to bridge the gap between prehospital emergency care and critical care transport by providing paramedics with in-depth knowledge of intensive care concepts and patient management strategies. The course focuses on the pathophysiology, monitoring, and advanced interventions required for critically ill and hemodynamically unstable patients.

#### Learning Objectives

- Understand the structure, protocols, and multidisciplinary functioning of the Intensive Care Unit (ICU), including care bundles, infection control, and transport protocols.
- Gain in-depth knowledge of respiratory and neurological emergencies in ICU, including mechanical ventilation, ARDS, and coma management.
- Learn to interpret ICU-based investigations such as chest X-rays, ventilatory parameters, ABG, and neurological assessments like GCS and ICP monitoring
- Demonstrate biomedical waste management principles in compliance with protocols.
- Understand safe intra- and inter-facility hospital transport protocols for critically ill patients.

#### Course Plan

Unit	Topics	Hours
Unit I	<b>ICU Fundamentals and Care Systems</b> <ul style="list-style-type: none"> <li>• ICU Admission Criteria and ICU Environment</li> <li>• Care bundles in ICU (VAP bundle, Sepsis bundle, CLABSI, CAUTI prevention)</li> <li>• Infection control practices in ICU</li> <li>• Biomedical waste management – segregation, colour coding, disposal</li> <li>• Nutrition support in ICU: Enteral and Parenteral nutrition</li> <li>• ICU crash cart setup and medication organization</li> <li>• Intra-hospital and inter-hospital transport of critically ill patients: Protocols, monitoring, and equipment required</li> </ul>	15 Hours

Unit	Topics	Hours
Unit II	<p><b>Respiratory Emergencies and Imaging</b></p> <ul style="list-style-type: none"> <li>• Respiratory emergencies:               <ul style="list-style-type: none"> <li>○ Acute respiratory failure</li> <li>○ COPD exacerbation</li> </ul> </li> <li>• ARDS               <ul style="list-style-type: none"> <li>○ Status asthmaticus</li> </ul> </li> <li>• Chest X-ray interpretation:               <ul style="list-style-type: none"> <li>○ Normal landmarks and cardiac silhouette</li> <li>○ Optimum placement of tubes and lines (ETT, NGT, Central line)</li> <li>○ Abnormal CXR: Tension Pneumothorax, Haemothorax, Lung contusion, ARDS, Pulmonary edema, Pneumonia types</li> </ul> </li> </ul>	15 Hours
Unit III	<p><b>Mechanical Ventilation Concepts</b></p> <p><b>Introduction to Mechanical Ventilation</b></p> <ul style="list-style-type: none"> <li>• Definition and goals of mechanical ventilation</li> <li>• Physiology of respiration and indications for ventilatory support Classification: Invasive vs. Non-Invasive Ventilation (NIV)</li> </ul> <p><b>Basic components of a ventilator circuit</b></p> <ul style="list-style-type: none"> <li>• Lung compliance – static and dynamic</li> <li>• Airway resistance – causes and clinical relevance Auto-PEEP – identification and implications</li> <li>• Tidal volume (Vt) – normal values and target setting Minute ventilation (VE) – importance in CO<sub>2</sub> removal</li> <li>• Use of ventilator graphics (Pressure-volume loop, Flow-volume loop)</li> </ul> <p><b>Initiation of Mechanical Ventilation</b></p> <ul style="list-style-type: none"> <li>• Indications for mechanical ventilation: respiratory failure types I &amp; II, altered sensorium, neuromuscular weakness</li> <li>• Initial setup parameters:               <ul style="list-style-type: none"> <li>• FiO<sub>2</sub></li> <li>• Respiratory rate (RR)</li> <li>• Tidal volume (6–8 ml/kg of ideal body weight) PEEP (positive end-expiratory pressure) Inspiratory: Expiratory ratio (I:E)</li> </ul> </li> <li>• Ventilator alarms and troubleshooting basics</li> </ul>	15 Hours

Unit	Topics	Hours
	<p><b>Modes of Ventilation</b></p> <ul style="list-style-type: none"> <li>○ Volume Control Ventilation (VCV) Pressure Control Ventilation (PCV)</li> <li>○ Synchronized Intermittent Mandatory Ventilation (SIMV) Assist-Control (A/C)</li> <li>○ Continuous Positive Airway Pressure (CPAP) Bi-level Positive Airway Pressure (BiPAP)</li> <li>○ Comparison of pressure vs. volume control mode</li> </ul> <p><b>Weaning and Extubation</b></p> <ul style="list-style-type: none"> <li>○ Criteria for weaning: RSBI, FiO<sub>2</sub> &lt; 40%, PEEP &lt; 5, good mental status, hemodynamic stability</li> <li>○ Weaning protocols: spontaneous breathing trials (SBT), T-piece trials Extubation procedure</li> <li>○ Extubation failure – causes, reintubation criteria, preventive measures</li> </ul>	
Unit IV	<p><b>Ventilator Care and ICU Procedures</b></p> <ul style="list-style-type: none"> <li>• Daily ventilator care protocols</li> <li>• ETT cuff pressure monitoring and securing</li> <li>• Tracheobronchial suctioning – open and closed techniques</li> <li>• Sedation holidays and sedation scales</li> <li>• Humidification systems</li> <li>• Chest physiotherapy, bedside pulmonary function tests (PFTs)</li> <li>• Role of bedside bronchoscopy</li> <li>• Restraint application in ICU</li> <li>• ICU endoscopy basics</li> <li>• Care and troubleshooting of Intercostal Drainage (ICD) systems</li> </ul>	15 Hours
Unit V	<p><b>CNS Monitoring and Neurocritical Care</b></p> <ul style="list-style-type: none"> <li>• Glasgow Coma Scale (GCS) and neurologic assessments</li> <li>• Sedation and delirium in ICU – Cause and management</li> <li>• Intracranial Pressure (ICP) monitoring</li> <li>• Brainstem death and brain death testing</li> <li>• Coma and unconscious patient protocols</li> <li>• Seizure and status epilepticus management</li> <li>• Guillain-Barré Syndrome: Critical care aspects</li> <li>• Analgesia and sedation protocols (RASS, BIS)</li> </ul>	15 Hours
	<b>Total</b>	<b>75 Hours</b>

#### 4. Intensive Care Concepts and Management - Practical

CL	CP	L	P
-	3	-	90

##### Instructors in charge:

Bachelor of Emergency Medical Technologist (Paramedic)

Masters of Advance Care Paramedic or Equivalent with experience.

##### Course Description

Paramedics will explore evidence-based practices in managing complex conditions such as respiratory failure, shock states, traumatic brain injury, multi-organ dysfunction, and sepsis. Emphasis is placed on high-acuity patient assessment, mechanical ventilation, advanced airway techniques, pharmacologic management, invasive monitoring, and the use of critical care equipment in transport settings. Through case-based learning, simulations, and skill labs, this course prepares paramedics to function as effective members of the critical care team.

##### Learning Objectives

By the end of this course, students will be able to

- Demonstrate appropriate usage, safety, and troubleshooting procedures for life-support devices.
- Apply knowledge of diagnostic and supportive equipment in emergency and intensive care settings.
- Integrate advanced critical care technologies into patient management scenarios through simulation.

##### Course Plan

Unit	Topics	Practical Hours
Unit I	<b>Airway and Ventilation Management</b> <ol style="list-style-type: none"> <li>1. Endotracheal tube suctioning (open and closed)</li> <li>2. Demonstration of cuff pressure monitoring</li> <li>3. FBAO techniques (CPR on mannequin)</li> <li>4. Airway adjuncts: OPA, NPA insertion</li> <li>5. BVM ventilation on mannequin</li> <li>6. Setting up a mechanical ventilator (Task Trainers/demonstration/simulation)</li> </ol>	15 Hours

Unit	Topics	Practical Hours
Unit II	<b>Monitoring and Equipment</b> <ol style="list-style-type: none"> <li>1. Monitoring parameters: SpO<sub>2</sub>, ECG, NIBP, RR, temperature</li> <li>2. Setting up ICU monitor and interpreting vitals</li> <li>3. Intercostal Drainage (ICD) care and troubleshooting</li> <li>4. Intra-hospital transport setup – equipment and protocol</li> <li>5. Crash cart layout and emergency drug arrangement</li> <li>6. Spirometry and bedside PFT (demonstration)</li> <li>7. Tracheostomy care (model-based)</li> </ol>	15 Hours
Unit III	<b>Drug Administration and Calculation</b> <ol style="list-style-type: none"> <li>1. Calculation of drug dosages and dilution (simulation)</li> <li>2. Preparation of IV adrenaline/dopamine infusion</li> <li>3. Identification and discussion of emergency drugs: <ul style="list-style-type: none"> <li>o Adrenaline, Atropine, Amiodarone</li> <li>o Diazepam, Lorazepam, Morphine, Fentanyl</li> <li>o Dopamine, Dobutamine, Phenytoin, Midazolam</li> <li>o Mannitol, Naloxone, Hydrocortisone</li> </ul> </li> <li>4. Drug route and technique: IV, IM, subcutaneous (mannequin/dummy)</li> <li>5. Use of syringe pump and infusion pump</li> </ol>	15 Hours
Unit IV	<b>Diagnostic &amp; Procedural Interpretation</b> <ol style="list-style-type: none"> <li>1. Chest X-ray interpretation – normal vs abnormal findings (trauma, ARDS, pneumothorax, etc.)</li> <li>2. ECG rhythm recognition – tachycardia, bradycardia, arrest rhythms</li> <li>3. ABG interpretation – acid-base disturbances</li> <li>4. Glasgow Coma Scale (GCS) scoring</li> <li>5. Sedation assessment tools (RASS/SAS)</li> </ol>	15 Hours
Unit V	<b>Special Procedures (Simulation/Demonstration)</b> <ol style="list-style-type: none"> <li>1. Neurologic assessment in ICU patient (pupil reaction, limb response)</li> <li>2. Preparation and equipment for bronchoscopy (demo)</li> <li>3. Bedside restraint application</li> <li>4. Endoscopy setup in ICU (demo)</li> <li>5. Sedation and analgesia administration protocol</li> </ol>	15 Hours
Unit VI	<ol style="list-style-type: none"> <li>1. BLS and ACLS Protocols Team Dynamics</li> <li>2. Megacode</li> <li>3. Simulation case scenarios</li> </ol>	15 Hours
	<b>Total</b>	<b>90 Hours</b>

**Text Books:**

- Nancy Caroline Emergency Care in the streets - 8th edition
- Mosby's EMT basic textbook 2nd edition
- Tintinalli's textbook of Emergency Medicine- Judith E. Tintinalli 9th edition
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition

**5. Emergency Clinical Procedures**

CL	CP	L	P
-	2	-	60

**Instructors in charge:**

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic Equivalent with experience.

**Course Description**

This hands-on, skills-focused course is designed to enhance the competence and confidence of paramedics in performing critical emergency clinical procedures across a wide range of prehospital scenarios. Emphasizing both foundational and advanced interventions, the course integrates evidence-based practices with real-world application to improve patient outcomes.

**Learning Objectives**

By the end of this course, students will be able to

- To develop and demonstrate proficiency in essential emergency and critical care procedures.
- To understand and apply evidence-based protocols in real-life scenarios to improve patient outcomes.
- To ensure students gain hands-on experience with basic and advanced techniques in emergency medical care, ensuring competence in high-pressure clinical environments

## Course Plan

Unit	Topics	Practical Hours
Unit I	<p><b>Gastrointestinal &amp; Genitourinary Procedures</b></p> <p><b>Gastrointestinal Procedures:</b></p> <ol style="list-style-type: none"> <li><b>Nasogastric Tube Insertion (Ryle's tube):</b> <ul style="list-style-type: none"> <li>Indications, Procedure, Confirmation, Troubleshooting.</li> <li>Practical demonstration and hands-on insertion.</li> </ul> </li> <li><b>Gastric Lavage:</b> <ul style="list-style-type: none"> <li>Indications in poisoning cases, technique, patient monitoring.</li> </ul> </li> <li><b>Whole Bowel Irrigation:</b> <ul style="list-style-type: none"> <li>Practical steps for managing toxic ingestion cases.</li> </ul> </li> <li><b>Peritoneal Lavage:</b> <ul style="list-style-type: none"> <li>Techniques in blunt trauma assessment.</li> </ul> </li> <li><b>Parenteral Nutrition:</b> <ul style="list-style-type: none"> <li>Venous access for nutrition administration and monitoring.</li> </ul> </li> </ol> <p><b>Genitourinary Procedures:</b></p> <ol style="list-style-type: none"> <li><b>Foley's Catheterization (Male &amp; Female):</b> <ul style="list-style-type: none"> <li>Techniques, indications, complications, and troubleshooting.</li> </ul> </li> <li><b>Bladder Washout/Irrigation:</b> <ul style="list-style-type: none"> <li>Procedure steps, monitoring during and after the procedure.</li> </ul> </li> </ol>	10 Hours
Unit II	<p><b>Vascular Access &amp; Neurological Procedures</b></p> <p><b>Vascular Access Procedures:</b></p> <ol style="list-style-type: none"> <li><b>Intravenous (IV) Cannulation:</b> <ul style="list-style-type: none"> <li>Selection of appropriate sites, needle sizes, and color coding.</li> <li>Insertion and troubleshooting.</li> </ul> </li> <li><b>Intramuscular (IM) Injection:</b> <ul style="list-style-type: none"> <li>Common sites, safety, and technique.</li> </ul> </li> <li><b>Intraosseous (IO) Access:</b> <ul style="list-style-type: none"> <li>Indications, equipment, and step-by-step process for insertion (e.g., EZ-IO).</li> </ul> </li> <li><b>Arterial Line Cannulation:</b> <ul style="list-style-type: none"> <li>Indications, sites (radial, femoral), and procedure.</li> <li><b>Allen's Test:</b> To assess collateral circulation.</li> </ul> </li> <li><b>Central Venous Cannulation:</b> <ul style="list-style-type: none"> <li>Jugular, subclavian, femoral sites, and troubleshooting.</li> </ul> </li> </ol>	15 Hours

Unit	Topics	Practical Hours
	<p>6. <b>ABG Sampling:</b></p> <ul style="list-style-type: none"> <li>○ Procedure for collection and analysis.</li> </ul> <p><b>Neurological Procedure:</b></p> <p>1. <b>Lumbar Puncture:</b></p> <p>Stepwise technique, patient positioning, complications, and post-procedure monitoring.</p>	
Unit III	<p><b>Cardiovascular Procedures</b></p> <ol style="list-style-type: none"> <li>1. <b>Central Venous Pressure (CVP) Monitoring:</b> <ul style="list-style-type: none"> <li>○ Setup, interpretation, and clinical use in shock states.</li> </ul> </li> <li>2. <b>Defibrillation:</b> <ul style="list-style-type: none"> <li>○ Manual and AED defibrillation.</li> <li>○ Pad placement, energy levels, troubleshooting.</li> </ul> </li> <li>3. <b>Synchronized Cardioversion:</b> <ul style="list-style-type: none"> <li>○ Preparation, indications, sedation, and monitoring.</li> </ul> </li> <li>4. <b>Transcutaneous Cardiac Pacing:</b> <ul style="list-style-type: none"> <li>○ Indications, device setup, patient preparation.</li> </ul> </li> <li>5. <b>Transvenous Cardiac Pacing:</b> <ul style="list-style-type: none"> <li>○ Overview, insertion, and troubleshooting during pacing.</li> </ul> </li> <li>6. <b>Pericardiocentesis:</b> <ul style="list-style-type: none"> <li>○ Indications, needle placement, ultrasound guidance.</li> </ul> </li> <li>7. <b>Thoracocentesis:</b> <ul style="list-style-type: none"> <li>○ Techniques for pleural fluid drainage in emergency scenarios.</li> </ul> </li> </ol>	15 Hours
Unit IV	<p><b>Respiratory and Airway Procedures Basic Airway Adjuncts:</b></p> <ol style="list-style-type: none"> <li>1. <b>Oropharyngeal Airway (OPA), Nasopharyngeal Airway (NPA):</b> <ul style="list-style-type: none"> <li>○ Sizing, insertion, and patient assessment.</li> </ul> </li> </ol> <p><b>Advanced Airway Management:</b></p> <ol style="list-style-type: none"> <li>1. <b>Laryngeal Mask Airway (LMA):</b> <ul style="list-style-type: none"> <li>○ Insertion technique, indications, troubleshooting.</li> </ul> </li> <li>2. <b>Combitube Insertion:</b> <ul style="list-style-type: none"> <li>○ Procedure and clinical uses in airway emergencies.</li> </ul> </li> <li>3. <b>Endotracheal Intubation:</b> <ul style="list-style-type: none"> <li>○ Equipment, indications, technique, and post-intubation care.</li> </ul> </li> <li>4. <b>Extubation:</b> <ul style="list-style-type: none"> <li>○ Criteria and technique for safely removing an ET tube.</li> </ul> </li> <li>5. <b>Orotracheal &amp; Nasotracheal Suctioning:</b> <ul style="list-style-type: none"> <li>○ Techniques for clearing secretions from the airway.</li> </ul> </li> </ol>	10 Hours

Unit	Topics	Practical Hours
	<p><b>Thoracic Procedures:</b></p> <ol style="list-style-type: none"> <li><b>Needle Cricothyrotomy:</b> <ul style="list-style-type: none"> <li>Indications, technique, and post-procedure care.</li> </ul> </li> <li><b>Intercostal Drainage (Chest Tube Insertion):</b> <ul style="list-style-type: none"> <li>Insertion sites, patient preparation, complications, monitoring.</li> </ul> </li> <li><b>Needle Decompression for Tension Pneumothorax:</b> <ul style="list-style-type: none"> <li>Step-by-step procedure, patient positioning, and assessment post-decompression.</li> </ul> </li> </ol> <p><b>Emergency Tracheostomy:</b> Indications and procedure for emergency airway management</p>	
Unit V	<p><b>Respiratory Support</b></p> <ol style="list-style-type: none"> <li><b>Basics of Mechanical Ventilation:</b> <ul style="list-style-type: none"> <li>Hands-on session to familiarize with ventilator settings (FiO<sub>2</sub>, PEEP, tidal volume, RR).</li> </ul> </li> <li><b>Initiation of Ventilation:</b> <ul style="list-style-type: none"> <li>Procedure to initiate ventilation, adjust initial ventilator settings.</li> </ul> </li> <li><b>High Flow Nasal Cannula (HFNC):</b> <ul style="list-style-type: none"> <li>Set-up, indications, and patient monitoring during HFNC therapy.</li> </ul> </li> <li><b>Ventilator Alarms and Troubleshooting:</b> <ul style="list-style-type: none"> <li>Understanding alarm types and taking corrective actions</li> </ul> </li> </ol>	10 Hours
	<b>Total</b>	<b>60 Hours</b>

**Reference Books & Resources:**

- Clinical Procedures in Emergency Medicine – Roberts and Hedges
- Tintinalli's Emergency Medicine: A Comprehensive Study Guide
- Emergency Procedures: A Handbook for Medical Professionals – Oxford University Press
- The ICU Book – Paul L. Marino (Ventilation, Mechanical support, and advanced procedures)
- Manual of Pediatric Emergency Procedures – Fleisher, Ludwig

## 6. Business Entrepreneurship Development

CL	CP	L	P
2	0	30	0

### Instructors in charge:

- Bachelor of Emergency Medical Technologist (Paramedic)
- Masters of Advance Care Paramedic or Equivalent with experience

### Course Description

This course introduces undergraduate students to the dynamic world of entrepreneurship, emphasizing the development of business ideas, the start-up lifecycle, and the entrepreneurial mindset. Designed to foster innovation, creativity, and strategic thinking, the course guides students through the foundational principles and practical processes involved in launching and managing successful ventures.

### Learning Objectives

By the end of this course, students will be able to

- To provide a comprehensive understanding of entrepreneurship and its role in economic development.
- To develop entrepreneurial skills and knowledge required to establish and manage a business.
- To inspire creativity and innovation in students to identify business- Business Entrepreneurship Development opportunities.
- To make students aware of institutional support for entrepreneurship development.
- To cultivate entrepreneurial attitudes, ethics, and responsibility.

### Course Plan

Unit	Topics	Hours
Unit I	<b>Introduction to Entrepreneurship</b> <ul style="list-style-type: none"><li>• Meaning, definition and importance of entrepreneurship</li><li>• Types of entrepreneurs</li><li>• Entrepreneur vs Manager</li><li>• Entrepreneurial process</li><li>• Role of entrepreneurship in economic development</li></ul>	06 Hours

Unit	Topics	Hours
Unit II	<b>Entrepreneurial Competencies and Motivation</b> <ul style="list-style-type: none"> <li>• Traits and characteristics of successful entrepreneurs</li> <li>• Innovation and creativity in entrepreneurship</li> <li>• Entrepreneurial motivation theories</li> <li>• Barriers to entrepreneurship</li> <li>• Women and rural entrepreneurship</li> </ul>	06 Hours
Unit III	<b>Business Idea Generation and Planning</b> <ul style="list-style-type: none"> <li>• Identifying business opportunities</li> <li>• Market research and feasibility study</li> <li>• Business Model Canvas</li> <li>• Preparing a business plan (executive summary, marketing, operations, financials)</li> <li>• Legal structures for startups (proprietorship, partnership, LLP, private/public limited)</li> </ul>	06 Hours
Unit IV	<b>Financial and Institutional Support</b> <ul style="list-style-type: none"> <li>• Sources of finance: Angel investors, venture capital, crowdfunding, bank loans</li> <li>• Government schemes for entrepreneurship (Startup India, Stand-up India, MSME)</li> <li>• Role of institutions: DIC, NSIC, SIDBI, NABARD, NIESBUD, EDI</li> <li>• Financial planning and break-even analysis</li> </ul>	06 Hours
Unit V	<b>Managing and Sustaining the Enterprise</b> <ul style="list-style-type: none"> <li>• Growth strategies: franchising, diversification, scaling</li> <li>• Entrepreneurial ethics and social responsibility</li> <li>• Managing business risks</li> <li>• Exit strategies: IPO, acquisition, liquidation</li> <li>• Case studies on successful Indian entrepreneurs</li> </ul>	06 Hours
	<b>Total</b>	<b>30 Hours</b>

**Textbooks:**

- Vasant Desai – Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House
- S.S. Khanka – Entrepreneurial Development, S. Chand & Company
- Raj Shankar – Entrepreneurship: Theory and Practice, Tata McGraw Hill
- Hisrich, Peters & Shepherd – Entrepreneurship, McGraw Hill Education

### Reference Books:

- David H. Holt – Entrepreneurship: New Venture Creation, Prentice Hall
- Dr. C.B. Gupta & Dr. S.S. Khanka – Entrepreneurship and Small Business Management, Sultan Chand & Sons
- Peter F. Drucker – Innovation and Entrepreneurship, Harper Business
- Nandan H. – Fundamentals of Entrepreneurship, PHI Learning Pvt. Ltd.

## Seventh and Eighth Semester

### Internship

Sl. No.	Course Titles	Hours per semester	
		Clinical Rotation	Total
<b>BEMT 701</b>	Internship	1250	1250
<b>BEMT 801</b>	Internship	1250	1250
	<b>Total</b>		<b>2500</b>

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

- ✓ A common year has 52 weeks + 1 day (365 days total)
- ✓ That means 52 Sundays occur (one per week).
- ✓ Subtracting those Sundays / One day off gives:
- ✓  $365 \text{ days} - 52 \text{ days} = 313 \text{ days}$
- ✓ Converting to weeks:
- ✓  $313 \div 7 = 44 \text{ full weeks with a remainder of 5 days.}$

1. Total week: 44

2. Hours Per Day: 8

$$313 \times 12 = 3744 \text{ Total Hours (4000)}$$

$$313 \times 8 = 2504 \text{ Total Hours (2500)}$$

$$313 \times 24 = 7512 \text{ Total Hours (7500)}$$

3. Clinical Credit

$$1 \text{ Credit} = 45 \text{ Hours Of Clinical Practice}$$

4. Calculating Credits:

$$2500 \div 45 = 55.55 (55)$$

## **Stipend**

There must be a provision for monthly stipends for students undergoing Bachelors of Emergency Medical Technologist (Paramedic) internships. This should be revised periodically. Acknowledging the occupational hazards and responsibilities they face including full-time clinical duties in pre hospital, emergency and critical care settings, often with high exposure to infectious or critical patients.

## **Rules and Regulation for Internship**

**Assessment:** Interns are required to maintain detailed records or log books of their work, subject to verification and certification by the Head of the Department under whose supervision they operate. In addition to scrutinizing the work records, the Head of the Department conducts assessments and evaluations of the interns' training, encompassing aspects such as attendance, discipline, knowledge, skills, and attitude throughout the training period. Assessment reports are subsequently forwarded to the parent institution.

Upon review of the work records and assessment data, the Director or Principal shall issue a "Certificate of Satisfactory Completion of Training." This certificate serves as the basis for the University to award the Bachelor in Emergency Care Degree or declare the candidate eligible for the same.

In the event of an unsatisfactory assessment report, the intern in question will be required to repeat the internship for a duration determined by the relevant Head of the Institution.

Interns are expected to adhere to all rules and regulations established by the Institution or Hospital where they are assigned.

Interns are personally responsible for the proper use of equipment within the Institute or Hospital where they are stationed. Any damages resulting from improper use will incur liability for the intern to cover repair or replacement costs.

## **Guidelines For Internship:**

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

### **Evaluation of Internees:**

1. Educative assessment/Assessment for learning: Assessment of the internees on daily basis during internship and postings should done by the Head of the Department. Objective – To develop minimum professional skills. Maintaining Log book by internees
2. Cumulative assessment: Under the observation of Technical staff/Faculty of the concerned department and maintained Log book by the interns. Certificate shall be issued after these two evaluations.
3. Duration of Internship: One year
4. Total working hours – Minimum 2500 hours Total working hours/day - 8 hours/day  
Lunch Time – 1 hour

### **Learning Objectives:**

- Develop proficiency in setting up and maintaining advanced prehospital and emergency department equipment, including ventilators, defibrillators, capnography, ultrasound, and mechanical stretchers, ensuring readiness for critical care scenarios
- Gain expertise in preparing and positioning patients for advanced airway and vascular procedures, ensuring optimal patient alignment for safe intubation, IV/IO access, and other critical interventions
- Learn to support anaesthesia and critical care teams during induction, maintenance, and emergence, performing advanced airway management (e.g., intubation, cricothyrotomy), ventilation support, and drug administration as required
- Acquire mastery of sterile technique and infection control in the field, including aseptic vascular access (central or intraosseous), airway procedures, surgical airways, and chest tube placements
- Develop abilities to recognize and respond to intraoperative and prehospital critical events, such as tension pneumothorax, cardiac arrest, anaphylaxis, or haemorrhage, utilizing advanced life support protocols and emergency interventions
- Enhance communication skills for effective patient interaction, advocacy, and clinical handover, including patient/family education and reporting to ED staff or receiving providers
- Foster teamwork and leadership within interdisciplinary emergency and critical care teams, collaborating with EMTs, nurses, dispatchers, physicians, and other EMS providers in dynamic environments
- Demonstrate professionalism, ethical conduct, and clinical accountability in all interactions, upholding legal, regulatory, and scope-of-practice standards as an ACP
- Engage in continuous learning, skills maintenance, and professional development, such as workshops in ACLS, PHTLS, ultrasound, and advanced pharmacology
- Develop critical thinking and problem-solving abilities for complex peri- and prehospital challenges, using rapid patient assessment, diagnostic interpretation (e.g. ECG, capnography), and protocol-driven decision-making

### Learning Outcomes:

- Demonstrated competence in setting up and maintaining advanced prehospital and emergency care equipment, including ventilators, CPAP, thoracostomy kits, ultrasound devices, and defibrillators all essential tools within the ACP scope
- provision of compassionate and attentive care to critically ill or injured patients, ensuring clinically appropriate interventions, emotional support, and ongoing assessment throughout prehospital transport
- Effective collaboration and communication within interdisciplinary emergency and critical care teams, including liaising with paramedics, nurses, anaesthetists, physicians, and other first responders to ensure seamless patient care
- Ability to recognize and respond promptly to intra- and prehospital critical emergencies, such as tension pneumothorax or cardiac arrest, and to execute advanced interventions like thoracostomy, advanced airway management, and mechanical ventilation
- Strict adherence to professionalism and ethical standards in clinical practice, including informed consent, patient confidentiality, patient-centred decision-making, and scope-of-practice boundaries.
- Engagement in ongoing education, advanced training, and professional development, covering areas such as advanced airway techniques, sedation/anaesthesia protocols, ultrasound-guided procedures, and advanced life support
- Application of critical thinking and evidence-based decision-making in complex peri- and prehospital scenarios, drawing on diagnostic data like capnography and ultrasound to guide interventions
- Accurate documentation of all interventions, monitoring, patient status, and transport handovers, ensuring continuity of care and compliance with clinical and legal standards
- Advocacy for patient safety, comfort, and dignity during high-acuity care, including optimal pain management, sedation balance, and prevention of adverse events during transport and handover
- Adherence to rigorous infection control and safety protocols, including use of PPE, aseptic technique during invasive procedures, and environmental decontamination to protect both patients and providers.

### Note/Protocols

#### 1. Documentation:

- Accurately document all procedures, observations, and interventions in the patient's medical record.
- Use clear and concise language following University/institutional guidelines for documentation.

## 2. Leave for Interns:

- No leave / absence is allowed to an Intern except as may be permitted by University/Institute
- Total leave allowed – Maximum 30 days during whole one year of internship
- Maximum leave allowed at a time: 10 days.
- **Extension of Internship Duration:** The Principal or Director may extend the duration of the internship under specific circumstances, including prolonged absence exceeding the permitted leave period, unsatisfactory performance, or disciplinary issues.

## 3. Communication:

- Communicate relevant information to the emergency medical team, emergency physician, critical care physician and nursing staff during handoffs and transitions of care.
- Document any verbal orders or instructions received during procedures promptly.

## 4. Safety Precautions:

- **Infection Control and Aseptic Technique**  
Adhere to infection control protocols and maintain aseptic technique during all patient interactions in prehospital settings, during transport, and when working alongside emergency and critical care teams.
- **Patient Verification**  
Ensure accurate verification of patient identity, confirm the appropriate intervention or procedure, and clearly communicate findings and planned actions with receiving healthcare providers.
- **Biohazardous Material Handling**  
Comply with protocols for the safe handling, containment, and disposal of biohazardous materials, including sharps and bodily fluids, to minimize the risk of contamination and ensure crew and public safety.

## 5. Incident Reporting:

- Report any adverse events, near misses, or equipment malfunctions promptly to the appropriate personnel.
- Document incidents accurately and thoroughly using the institution's incident reporting system.

## 6. Confidentiality:

- Maintain patient confidentiality at all times, both in verbal communication and electronic documentation.
- Avoid discussing patient information in public areas or with unauthorized individuals.

## Clinical Internship Curriculum Program: Bachelors in Emergency Medical Technologist (Paramedic)

**Duration:** 1 Year (12 Months)

### 1. Hospital Units for Internship Postings

Students will be posted across the following relevant departments to gain comprehensive exposure to emergency and critical care:

S. No	Hospital Unit / Department	Duration
1	Pre-Hospital Care / EMS / Ambulance Services	4weeks
2	Emergency Department (Casualty)	8 weeks
3	Medical Intensive Care Unit (MICU)	6 weeks
4	Surgical ICU (SICU)	4 weeks
5	Neuro ICU (NICU)	3 weeks
6	Cardiac ICU (CCU)	3 weeks
7	Trauma Unit / Trauma ICU	4 weeks
8	Post-Anaesthesia Care Unit (PACU)	4 weeks
9	Operation Theatre (Emergency & Elective Surgeries)	1weeks
10	Anaesthesia Department	2 weeks
11	Toxicology / Poison Management Unit	2 weeks
12	Respiratory Therapy Unit / Pulmonology	1 week
13	Radiology & Imaging (Emergency USG, CT, CXR, FAST)	1 week
14	Burns Unit	2 week
15	Dialysis Unit / Renal Emergency Care	1 week
16	Labour Room & Obstetric Emergency Unit	2 weeks
17	Paediatric Emergency / NICU / PICU	1 week
18	Central Sterile Supply Department (CSSD)	1 week
19	Disaster Management & Mass Casualty Simulation	2 weeks

## 2. Key Practical Exposures

### A. Equipment & Machines

- Defibrillators (AED & Manual)
- Ventilators (Invasive & Non-Invasive)
- CPAP / BiPAP Machines
- ECG Machines
- Syringe Pumps & Infusion Pumps
- Suction Apparatus
- Crash Cart Handling
- Multiparameter Monitors
- Laryngoscope, ET Tubes, BVM
- ABG Analyzer, Glucometer
- Nebulizers, Oxygen Therapy Devices

### B. Procedures & Skills

- Primary & Secondary Assessment (ABCDE)
- Triage System & Early Warning Scoring
- Assisting Intubation, Suctioning
- Setting up and monitoring ventilators
- Initiating and assisting in CPR (BLS/ACLS)
- Handling polytrauma cases
- FAST Scan observation
- Medication preparation & emergency drug tray setup
- Wound care, splinting, IV cannulation (under supervision)
- Infection control and biomedical waste segregation
- Assisting in dialysis & emergency deliveries (where applicable)

## 3. Learning Objectives & Expected Competencies

### A. Knowledge-Based Objectives

- Understand common emergency conditions and their management
- Familiarize with emergency protocols: CPR, trauma, stroke, sepsis
- Learn emergency pharmacology and drug preparation
- Recognize critical signs of deterioration

### B. Skill-Based Objectives

- Perform basic and advanced life support
- Accurately monitor and report patient vitals
- Operate emergency care equipment safely
- Assist in airway management and resuscitation
- Support in trauma and cardiac arrest management

### C. Attitude-Based Objectives

- Demonstrate teamwork in high-pressure environments
- Prioritize tasks in life-threatening situations
- Communicate empathetically with patients and families
- Maintain confidentiality, ethics, and professionalism

### 4. Rotation Schedule Sample (Flexible)

Month	Posting
Month 1	Prehospital EMS + Emergency Dept
Month 2	Emergency Dept + Trauma
Month 3	MICU
Month 4	SICU
Month 5	Neuro ICU + Cardiac ICU
Month 6	OT + Anaesthesia + PACU
Month 7	Toxicology + Respiratory
Month 8	Radiology + Burns + Dialysis
Month 9	Paediatric Emergency / NICU
Month 10	Obstetric Emergency + CSSD
Month 11	Disaster Management + Extra ICU
Month 12	Electives / Revision / Evaluation & Feedback

### Assessment & Certification

- **Clinical Logbook:** To be signed Daily by department in-charge
- **Skill Checklist:** Minimum competency checklist to be completed
- **Monthly Evaluations:** Attitude, skills, attendance, and knowledge
- **Final Viva / OSCE:** Conducted at the end of the internship
- **Certificate of Completion:** Issued by hospital academic department

### Attachments

- Clinical Logbook Format
- Skill Competency Checklist
- Monthly Feedback Template

## Curriculum Mapping and Credit Management

### Credits and Assessments Outline

#### First Semester

Course Code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
BEMT 101	Anatomy	3	1	4	45	30	75	30	70	100
BEMT 102	Physiology	3	1	4	45	30	75	30	70	100
BEMT103	Biochemistry	3	1	4	45	30	75	30	70	100
BEMT104	Introduction to EMS and Ambulance Operation	1	2	3	15	30	45	30	70	100
BEMT105	Communication Skills	2	-	2	30	-	30	25	25	50
BEMT106	Basics of Computers	2	-	2	30	-	45	25	25	50
<b>Total</b>		<b>14</b>	<b>5</b>	<b>19</b>	<b>240</b>	<b>120</b>	<b>375</b>	<b>170</b>	<b>330</b>	<b>500</b>

#### Second Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
BEMT 201	Pharmacology	3	1	4	45	30	75	30	70	100
BEMT 202	Pathology	3	1	4	45	30	75	30	70	100
BEMT 203	Microbiology	3	1	4	45	30	75	30	70	100
BEMT 204	Instrumentation of EM part-I	3	1	4	45	30	75	30	70	100
BEMT 205	Community Medicine	1	1	2	15	30	45	25	25	50
BEMT 206	Psychology	1	1	2	15	30	45	25	25	50
<b>Total</b>		<b>14</b>	<b>6</b>	<b>20</b>	<b>210</b>	<b>180</b>	<b>390</b>	<b>170</b>	<b>330</b>	<b>500</b>

### Third Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>BEMT 301</b>	Introduction to Patient Care and Assessment	3	1	4	45	30	75	30	70	100
<b>BEMT 302</b>	Medical Emergencies Part-1: Respiratory, Cardiovascular, Neurological, Gastrointestinal and Genitourinary	3	1	4	45	30	75	30	70	100
<b>BEMT 303</b>	Trauma Emergencies part-1: Introduction to Trauma, Hemorrhage and Shock, Head and Facial Trauma, Thoracic and Abdominal Trauma.	3	1	4	45	30	75	30	70	100
<b>BEMT 304</b>	Instrumentation Part-2	3	1	4	45	30	75	30	70	100
<b>BEMT 305</b>	Indian culture, heritage, yoga & meditation	2	-	2	30	-	30	25	25	50
<b>BEMT 306</b>	Soft skills and Clinical Communication Skills	2	-	2	30	-	45	25	25	50
<b>Total</b>		<b>16</b>	<b>4</b>	<b>20</b>	<b>240</b>	<b>120</b>	<b>375</b>	<b>170</b>	<b>330</b>	<b>500</b>

## Fourth Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>BEMT 401</b>	Medical Emergencies-II	3	1	4	45	30	75	30	70	100
<b>BEMT4 02</b>	Trauma – II	3	1	4	45	30	75	30	70	100
<b>BEMT 403</b>	Surgical Emergencies	3	1	4	45	30	75	30	70	100
<b>BEMT 404</b>	Burns	3	1	4	45	30	75	30	70	100
<b>BEMT 405</b>	Introduction and Application of Artificial Intelligence in healthcare	2	-	2	30	-	30	25	25	50
<b>BEMT 406</b>	Healthcare management: Personality development, Leadership, Human Rights	2	-	2	30	-	30	25	25	50
<b>Total</b>		<b>16</b>	<b>4</b>	<b>20</b>	<b>240</b>	<b>120</b>	<b>360</b>	<b>170</b>	<b>330</b>	<b>500</b>

## Fifth Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessment		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>BEMT 501</b>	Toxicology and Environmental Emergencies	3	1	4	45	30	75	30	70	100
<b>BEMT 502</b>	Gynecological and Obstetric Emergencies	3	1	4	45	30	75	30	70	100
<b>BEMT 503</b>	Neonatology and Pediatric	3	1	4	45	30	75	30	70	100
<b>BEMT 504</b>	Clinical Pharmacology- Emergency Medications	3	1	4	45	30	75	30	70	100
<b>BEMT 505</b>	Basics of Radiology & Imaging Interpretation	2	1	3	30	30	60	25	25	50
<b>BEMT 506</b>	Telemedicine	2	1	3	30	30	60	25	25	50
<b>Total</b>		<b>16</b>	<b>6</b>	<b>22</b>	<b>240</b>	<b>180</b>	<b>420</b>	<b>170</b>	<b>330</b>	<b>500</b>

## Sixth Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>BEMT 601</b>	Disaster and MCI Management	3	1	4	45	30	75	30	70	100
<b>BEMT 602</b>	Research Methodology and Biostatistics	3	-	3	45	-	45	30	70	100
<b>BEMT 603</b>	Intensive Care Concepts and Management	6	-	6	90	-	90	30	70	100
<b>BEMT 604</b>	Intensive Care Concepts and Management Practical	-	3	3	-	90	90	30	70	100
<b>BEMT 605</b>	Emergency Clinical Procedures	-	3	3	-	90	90	25	25	50
<b>BEMT 606</b>	Business Entrepreneurship Development	2	-	2	30	-	30	25	25	50
<b>Total</b>		<b>14</b>	<b>7</b>	<b>21</b>	<b>210</b>	<b>210</b>	<b>420</b>	<b>170</b>	<b>330</b>	<b>500</b>

## Seventh and Eight Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>BEMT 701</b>	Internship					1250	1250			
<b>BEMT 801</b>	Internship					1250	1250			
<b>Total</b>						<b>2500</b>	<b>2500</b>			

## Masters of Advanced Care Paramedic

### Eligibility for admission:

Bachelor of Emergency Medical Technologist or equivalent from a recognized university

### Duration of the course

The Masters of Advanced Care Paramedic post graduate degree program is of two years duration. Duration of the course: 2 years or 4 semesters.

### Total hours –2200 (including clinical and research) 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-

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

### Credit Details:

One credit implies one hour lecture per week or two hours of laboratory/practical per week or two hours of clinics per week or two hours of Research project per week A semester is considered to have 15 weeks.

For example,

1 credit course = 15 hours of lectures per semester

3 credits course = 45 hours of lectures per semester

1 credit course = 30 hours of practical/laboratory per week

CL	CP	L	P
3	1	45	30

CL: Credit for Lecture, CP: Credit for Practicals, L: Hours for Lecture, P: Hours for Practicals

### Proposed Scheme

Year	Semester	Credits	Hours
1	1	21	435
	2	21	450
2	3	21	450
	4	22	480
<b>Total</b>		<b>85</b>	<b>1815</b>

## Curriculum Outline

### First Semester

Sl. No.	Course Titles	Hours/Semester		
		Lecture	Practicals	Total
MACP101	Pre-Hospital Care Management	45	60	75
MACP102	Musculoskeletal Emergencies	45	60	75
MACP103	Surgical Emergencies	45	60	75
MACP104	Research Methodology and Biostatistics	60	-	60
	Clinical Rotation 1		60	60
<b>TOTAL</b>		<b>195</b>	<b>180</b>	<b>435</b>

### Second Semester

Sl. No.	Course Titles	Hours/Semester		
		Lecture	Practicals	Total
MACP201	Pharmacology	60	60	120
MACP202	Critical Care Management	60	60	120
MACP203	Toxicology	60	60	120
MACP204	Open Elective	-	-	30
	Clinical Rotation 2		60	60
<b>TOTAL</b>		<b>180</b>	<b>240</b>	<b>450</b>

### Third Semester

Sl. No.	Course Titles	Hours per Semester		
		Lecture	Practicals	Total
MACP301	Obstetric and Gynecological Emergencies	60	60	120
MACP302	Pediatric Emergencies	60	60	120
MACP303	Medical Emergencies -I	60	60	120
MACP304	Open Elective			30
	Clinical Rotation 3		60	60
<b>TOTAL</b>		<b>180</b>	<b>240</b>	<b>450</b>

#### Fourth Semester

Sl. No.	Course Titles	Hours per Semester		
		Lecture	Practicals	Total
MACP401	Emergency Clinical Procedure	60	60	120
MACP402	Disaster Management and Industrial Emergency	60	-	60
MACP403	Advanced Medical Emergencies- II	60	60	120
MACP404	Dissertation	-	120	120
	Clinical Rotation 4		60	60
<b>TOTAL</b>		<b>180</b>	<b>300</b>	<b>480</b>

#### Assessment:

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

#### First Semester

##### 1. Pre-Hospital Care Management

CL	CP	L	P
3	2	45	60

#### Instructors In charge:

Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This course focuses on the EMS System, patient assessment, stabilisation, communication, and transport, emphasising evidence-based practices and teamwork in emergency medical services (EMS).

**Objectives:** At the end of the semester, the student should be able to:

- Understand the Scope of Practice and Basic Concepts in Emergency Medical Services (EMS)
- Understand the Communication in EMS and Legal Implication Related Operations, Transportation and Documentation
- To Possess the Knowledge about Patient Assessment
- To Possess the Knowledge on Special Operations

**Course Plan:**

Unit	Topic / Module	Hours
<b>Unit 1: EMS System</b>	<ol style="list-style-type: none"> <li>1. History of EMS</li> <li>2. Levels of EMS Education and Paramedic Education</li> <li>3. Roles and Responsibility of Paramedic</li> <li>4. Working with other Professionals</li> </ol>	6
<b>Unit 2: Workforce Safety and Wellness</b>	<ol style="list-style-type: none"> <li>1. Wellbeing of a Paramedic</li> <li>2. Patient lifting and shifting</li> <li>3. Disease Transmission</li> <li>4. Protecting our self</li> <li>5. Stress</li> <li>6. Coping with death and dying</li> </ol>	7
<b>Unit 3: Medical, Legal, and Ethical Issues</b>	<ol style="list-style-type: none"> <li>1. Medical Ethics</li> <li>2. Legal Accountability of the Paramedic</li> <li>3. Paramedic and patient relationship</li> <li>4. Negligence and Protection</li> </ol>	5
<b>Unit 4: Communications</b>	<ol style="list-style-type: none"> <li>1. Basic of Communications</li> <li>2. Responding to Emergency Calls</li> <li>3. EMS Communication System</li> <li>4. Radio Communication</li> </ol>	7
<b>Unit 5: Documentation</b>	<ol style="list-style-type: none"> <li>1. Importance and general consideration Documentation</li> <li>2. Elements and Narrative writing in documentation</li> <li>3. Special consideration, revision and correction of PCR</li> <li>4. Legal Implications of a Pre-hospital Care Record</li> </ol>	6
<b>Unit 6: Patient Assessment</b>	<ol style="list-style-type: none"> <li>1. Scene Size Up</li> <li>2. Primary Survey</li> <li>3. History Taking</li> <li>4. Secondary Assessment</li> <li>5. Reassessment</li> <li>6. Critical Thinking and Clinical Decision Making</li> </ol>	7
<b>Unit 7: Special Operation in Prehospital</b>	<ol style="list-style-type: none"> <li>1. Incident Management and Mass Casualty Incident</li> <li>2. Vehicle Extrication</li> <li>3. Specialized Rescue Situation</li> <li>4. HAZMAT Incident</li> <li>5. Crime Scene Awareness</li> </ol>	7

Unit	Topic / Module	Hours
Practical Skills (lab/clinical/ simulation)	1. Primary Assessment	60
	2. Secondary Assessment	
	3. Rapid Trauma Assessment	
	4. History Taking	
	5. Patient lifting and moving	
	<b>Total Hours</b>	<b>105 Hours</b>

**Reference textbooks:**

- Nancy Caroline's Emergency Care in Street, 8<sup>th</sup> Edition.
- Mosby's Paramedic Textbook, 4<sup>th</sup> Edition by Mick J Sanders

## 2. Musculoskeletal Emergencies

CL	CP	L	P
3	2	45	60

**Instructors In charge:**

Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This course focuses on the assessment and management of systemic and musculoskeletal injury during trauma. It includes hands-on training in the spinal motion restriction & immobilization, and splinting of musculoskeletal emergencies in a pre-hospital setting.

**Objectives:** At the end of the semester, the student should be able to:

- Describe the anatomy and physiology of the Human body system.
- Recognize systemic and musculoskeletal injuries.
- Assess and manage patient with trauma
- Spinal Motion Restriction.
- Practice immobilisation and prevent complications.

**Course Plan:**

Unit	Topic / module	Hours
<b>Unit 1: Trauma Systems and Mechanism of Injury</b>	<ul style="list-style-type: none"> <li>• Kinematics</li> <li>• Blunt Injury</li> <li>• Penetrating Injury</li> <li>• Blast Injury</li> </ul>	4
<b>Unit 2: Bleeding and Soft Tissue Injury</b>	<ul style="list-style-type: none"> <li>• Hypovolemic Shock</li> <li>• Soft Tissue Injury</li> <li>• Crush Injury</li> <li>• Amputation</li> </ul>	4
<b>Unit 3: Systemic Injury</b>	<ul style="list-style-type: none"> <li>• Head and Maxillofacial Injury</li> <li>• Neck Injury</li> <li>• Chest Injury</li> <li>• Abdominal Injury</li> </ul>	4
<b>Unit 4: Introduction to Musculoskeletal Injury</b>	<ul style="list-style-type: none"> <li>• Fracture and types of fracture</li> <li>• Subluxation and dislocation</li> <li>• Fracture Healing and complications of fracture</li> </ul>	3
<b>Unit 5: Pelvic Trauma</b>	<ul style="list-style-type: none"> <li>• Anatomy and physiology of pelvis</li> <li>• Mechanism of injury, assessment and management of pelvic injury</li> <li>• Pelvic Dislocation</li> </ul>	2
<b>Unit 6: Spinal injury</b>	<ul style="list-style-type: none"> <li>• Anatomy and physiology of spinal cord</li> <li>• Mechanism of injury, assessment and management of spinal bone injury</li> <li>• Mechanism of injury, assessment and management of the spinal cord</li> </ul>	2

Unit	Topic / module	Hours
<b>Unit 7: Upper Extremity Injury</b>	<ol style="list-style-type: none"> <li>1. Anatomy and range of motion of the upper extremity</li> <li>2. Injury around the shoulder               <ol style="list-style-type: none"> <li>a. Cervical fracture</li> <li>b. Fracture of the scapula</li> <li>c. Shoulder dislocation</li> </ol> </li> <li>3. Injury to the Arm               <ol style="list-style-type: none"> <li>a. Proximal humerus fracture</li> <li>b. Shaft of humerus fracture</li> <li>c. Distal Humerus Fracture</li> </ol> </li> <li>4. Injury around the elbow               <ol style="list-style-type: none"> <li>a. Supracondylar fracture</li> <li>b. Elbow dislocation</li> </ol> </li> <li>5. Injury to the forearm               <ol style="list-style-type: none"> <li>a. Both bone fractures of the forearm</li> <li>b. Monteggia's fracture</li> <li>c. Galeazzi's fracture</li> <li>d. Smith and Barton fracture</li> </ol> </li> <li>6. Wrist Injury</li> <li>7. Hand Injury</li> </ol>	13
<b>Unit 8: Lower Extremity Injury</b>	<ol style="list-style-type: none"> <li>1. Anatomy and range of motion of the lower extremity</li> <li>2. Femur Fracture               <ol style="list-style-type: none"> <li>a. Head of femur fracture</li> <li>b. Neck of femur</li> <li>c. Shaft of femur fracture</li> <li>d. Distal/supracondylar fracture</li> </ol> </li> <li>3. Injury to the Knee</li> <li>4. Patella fracture</li> <li>5. Knee dislocation</li> <li>6. Tibia and fibula fracture</li> <li>7. Ankle injury</li> <li>8. Achilles Tendon Injury</li> <li>9. Foot Injury</li> </ol>	13
<b>Practical Skills</b> (lab/clinical/ simulation)	<ol style="list-style-type: none"> <li>1. Cervical collar</li> <li>2. Spine motion restriction devices</li> <li>3. Pelvic binder</li> <li>4. Splinting techniques</li> <li>5. Plaster of Paris</li> </ol>	60
	<b>Total Hours</b>	<b>105 Hours</b>

**Reference textbooks:**

- Advanced Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT, 2022)
- Prehospital Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT)
- Textbook of Orthopedics, 5<sup>th</sup> edition, John Ebinezer.
- Textbook of orthopedics and traumatology, Mayil Vahanan Natarajan
- Nancy Caroline's Emergency Care in Street, 8<sup>th</sup> Edition

**3. Surgical Emergencies**

CL	CP	L	P
3	2	45	60

**Instructors In charge:**

Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This course provides a comprehensive overview of the diagnosis, assessment, and initial management of surgical emergencies commonly encountered in emergency departments and acute care settings.

**Objectives:** At the end of the semester, the student should be able to:

- Identify and prioritize life-threatening surgical conditions.
- Perform systematic evaluation and initiate resuscitation in surgical emergencies.
- Interpret relevant diagnostic tests and imaging.
- Implement initial management and procedural interventions.

**Course Plan:**

Unit	Topic / module	Hours
<b>Unit 1: Principles of anaesthesia</b>	1. Pre-anaesthetic Assessment 2. Airway Management 3. General Anaesthesia 4. Local Anaesthesia 5. Regional Anaesthesia	8
<b>Unit 2: Wounds</b>	1. Types of wounds and wound management 2. Wound healing 3. Suturing 4. Tetanus 5. Gas gangrene	10

Unit	Topic / module	Hours
<b>Unit 3: Abdominal and Gastrointestinal Emergencies</b>	<ol style="list-style-type: none"> <li>1. Acute abdominal pain</li> <li>2. Oesophageal emergencies <ul style="list-style-type: none"> <li>• Gastro-oesophageal reflux disease</li> <li>• Oesophageal obstruction</li> </ul> </li> <li>3. Gastrointestinal bleeding <ul style="list-style-type: none"> <li>• Upper GI Bleeding</li> <li>• Lower GI Bleeding</li> </ul> </li> <li>4. Stomach and Duodenum <ul style="list-style-type: none"> <li>• Peptic ulcer</li> <li>• Duodenal ulcer</li> </ul> </li> <li>5. Abdominal Aortic Aneurysm</li> <li>6. Appendicitis</li> <li>7. Pancreatitis</li> <li>8. Cholecystitis</li> <li>9. Intestinal obstruction</li> <li>10. Intestinal perforation</li> <li>11. Hernias</li> </ol>	20
<b>Unit 4: Genitourinary System</b>	<ol style="list-style-type: none"> <li>1. Renal Colic</li> <li>2. Ureteric colic</li> <li>3. Torsion of the testis</li> </ol>	4
<b>Unit 5: Anorectal Disorders</b>	<ol style="list-style-type: none"> <li>1. Rectal Prolapse</li> <li>2. Haemorrhoids</li> </ol>	3
<b>Practical Skills</b> (lab/clinical/ simulation)	<ol style="list-style-type: none"> <li>1. Suturing</li> <li>2. Tracheostomy</li> <li>3. Surgical Cricothyroidotomy</li> <li>4. Needle Cricothyrotomy</li> <li>5. Needle thoracocentesis</li> <li>6. Intercostal drainage</li> </ol>	60
	<b>Total Hours</b>	<b>105 Hours</b>

**Reference textbooks:**

- Advanced Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT, 2022)
- Prehospital Trauma Life Support (ATLS) Provider Manual, 10th Ed. (NAEMT)
- Textbook of Orthopedics, 5<sup>th</sup> edition, John Ebenezzer.
- Textbook of orthopedics and traumatology, Mayil Vahanan Natarajan
- Nancy Caroline's Emergency Care in Street, 8<sup>th</sup> Edition

## 4. Research Methodology and Biostatistics

CL	CP	L	P
4	-	60	-

### Instructors In charge:

Ph.D. or Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This course introduces the fundamental principles of research methodology, including research design, data collection, data analysis, and interpretation. It equips learners with the skills to plan, conduct, analyze, and present research systematically in academic and professional contexts. It will cover principles and applications of biostatistics in health sciences. It covers descriptive and inferential statistical methods, probability concepts, study design, hypothesis testing, and data analysis. Practical sessions will ensure learners can apply statistical tools to real-world biomedical and public health research problems.

### PART A: Research Methodology

**Objectives:** At the end of the semester, the student should be able to:

- Understand the principles and ethics of research.
- Formulate research problems, objectives, and hypotheses.
- Select appropriate research designs and methods.
- Collect, analyze, and interpret data.

### Course Plan:

Unit	Topic / module	Hours
<b>Unit 1: Introduction to Research</b>	<ol style="list-style-type: none"> <li>1. Definition, scope, and objectives of research</li> <li>2. Types of research: Basic, applied, qualitative, quantitative, and mixed methods.</li> <li>3. Outline the Research Process</li> <li>4. Research Problem Identification</li> </ol>	4
<b>Unit 2: Review of literature</b>	<ol style="list-style-type: none"> <li>1. Purpose and sources of literature review.</li> <li>2. Organising and synthesising literature.</li> </ol>	3
<b>Unit 3: Research Design</b>	<ol style="list-style-type: none"> <li>1. Broad classification of study design</li> <li>2. Qualitative Vs Quantitative study design</li> <li>3. Experimental Vs Non-experimental study design</li> <li>4. Validity, reliability and bias</li> </ol>	4

<b>Unit 4: Research Process</b>	1. Framing Research question 2. Research title 3. Aim and Objectives, Assumptions, Limitations and Deliberations, Variables 4. Hypothesis formation and testing	4
<b>Unit 5: Data Collection Methods</b>	1. Primary Vs Secondary Data 2. Data collection tool 3. Designing and validating a research tool 4. Ethical consideration in data collection	4
<b>Unit 6: Data Analysis</b>	1. Qualitative and Quantitative analysis 2. Graphical Representation	3
<b>Unit 7: Research Ethics</b>	1. Ethical Principles in Research 2. Plagiarism 3. Institutional Review Board and ethical clearance 4. Data Privacy	4
<b>Unit 8: Writing a Research Paper</b>	1. Structure of a research report/thesis/dissertation 2. Referencing style 3. Writing a research proposal, abstract, and publication	4
	<b>Total Hours</b>	<b>30 Hours</b>

## PART B: Biostatistics

**Objectives:** At the end of the semester, the student should be able to:

- Understand the role of biostatistics in healthcare and research.
- Summarize, visualize, and interpret health data.
- Apply probability concepts in epidemiology and clinical research.
- Conduct hypothesis testing using appropriate statistical methods.

**Course Plan:**

Unit	Topic / module	Hours
<b>Unit 1: Introduction to Biostatistics</b>	1. Definition, scope, and objectives of biostatistics 2. Types of data: Qualitative Vs Quantitative 3. Scale of Measurement	4
<b>Unit 2: Data Collection</b>	1. Source of Biomedical Data 2. Sampling techniques 3. Data Summarization and Graphical Representation	4
<b>Unit 3: Descriptive Statistics</b>	1. Measure of Central Tendency 2. Measure of Dispersion	3

<b>Unit 4: Probability and Distribution</b>	1. Probability concept and rules 2. Discrete Distribution 3. Continuous Distribution	4
<b>Unit 5: Sampling and Estimation</b>	1. Concept of population and sample 2. Sampling errors and standard error 3. Confidence Intervals, mean and proportion	4
<b>Unit 6: Hypothesis Testing</b>	1. Null and alternative hypotheses 2. Types I & II error, p-values and Significance level 3. Parametric Vs Non parametric test	4
<b>Unit 7: Correlation and Regression</b>	1. Correlation – Pearson, Spearman 2. Simple linear regression 3. Multiple regression analysis	4
<b>Unit 8: Epidemiological and Survival Analysis</b>	1. Relative risk and odds ratio 2. Sensitivity, specificity, and predictive values	3
	<b>Total Hours</b>	<b>30 Hours</b>

**Reference textbooks:**

- Kothari, C.R. & Garg, G. (2019). Research Methodology: Methods and Techniques
- Kumar, R. (2019). Research Methodology: A Step-by-Step Guide for Beginners. SAGE Publications
- Creswell, J.W. & Creswell, J.D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications.
- Rao NSN: Applied statistics in health sciences, JP publishers
- Mahajan B.K: Methods of biostatistics, Kothari book depot, A.D Marg, Bombay
- Lancaster H.O: Introduction to medical statistics, Johnwiley & sons, New York.
- Cotton T: Statistics in medicine, Little Brown & Co, Boston.
- Hill A.B: Principles of medical statistics, Oxford University press, New York

## Second Semester

### 1. Pharmacology

CL	CP	L	P
4	2	60	60

**Instructors in charge:** MD Pharmacology / PhD Pharmacology / M.Pharm or Pharm D who have adequate experience in teaching pharmacology.

**Course Description:**

This course covers the mechanisms of action, indications, dosage, adverse effects and routes of administration of life-saving and widely used medications in the emergency department and EMS.

**Objectives:** At the end of the semester, the student should be able to:

- Understand the pharmacokinetics and pharmacodynamics of drugs commonly used in emergency and critical care.
- Analyze the mechanisms of action, therapeutic uses, and adverse effects of drugs relevant to acute care.
- Evaluate the rational use of drugs in life-threatening conditions, including shock, sepsis, cardiac arrest, trauma, and poisoning.
- Apply evidence-based pharmacological principles to optimize patient outcomes in emergency and ICU settings.
- Critically appraise and interpret current clinical guidelines, research, and trials in emergency pharmacology.

**Course Plan:**

Unit	Topic / module	Hours
Unit I	<b>General Principles of Pharmacology</b> <ul style="list-style-type: none"><li>• Introduction to pharmacology, drug nomenclature, sources of drugs</li><li>• Pharmacokinetics (absorption, distribution, metabolism, excretion)</li><li>• Pharmacodynamics: receptor theory, dose-response, therapeutic index</li><li>• Routes of drug administration in emergency and ICU settings (IV, intraosseous, inhalational, etc.)</li><li>• Adverse drug reactions, drug interactions, Pharmacovigilance</li><li>• Rational drug use and essential drug concepts in critical care</li></ul>	10

Unit II	<p><b>Autonomic and Cardiovascular Pharmacology</b></p> <ul style="list-style-type: none"> <li>• Sympathomimetics and sympatholytics in emergency medicine</li> <li>• Parasympathomimetics and parasympatholytics</li> <li>• Anti-hypertensives: vasodilators, beta-blockers, calcium channel blockers</li> <li>• Drugs for shock management (vasopressors: dopamine, norepinephrine, epinephrine, vasopressin, phenylephrine)</li> <li>• Antiarrhythmic drugs (classes I–IV, amiodarone, adenosine, digoxin)</li> <li>• Drugs for cardiac arrest and ACLS pharmacology</li> <li>• Drugs used in acute heart failure and myocardial infarction (diuretics, nitrates, ACE inhibitors, inotropes)</li> </ul> <p><b>Respiratory Pharmacology</b></p> <ul style="list-style-type: none"> <li>• Drugs for asthma and COPD (beta-agonists, corticosteroids, leukotriene inhibitors, anticholinergics)</li> <li>• Emergency use of bronchodilators and nebulization therapy</li> <li>• Drugs in acute respiratory failure and ARDS management</li> <li>• Oxygen therapy, nitric oxide, and surfactant therapy in ICU</li> </ul>	15
Unit III	<p><b>CNS Pharmacology</b></p> <ul style="list-style-type: none"> <li>• Sedatives, hypnotics, and anxiolytics in ICU (benzodiazepines, propofol, dexmedetomidine)</li> <li>• General anesthetics in emergency settings</li> <li>• Opioid and non-opioid analgesics (morphine, fentanyl, tramadol, ketamine)</li> <li>• Anticonvulsants (phenytoin, valproate, levetiracetam, midazolam infusion in status epilepticus)</li> <li>• Neuroprotective drugs and stroke pharmacology (thrombolytics, antiplatelets, anticoagulants)</li> <li>• Muscle relaxants in ICU (succinylcholine, vecuronium, rocuronium)</li> </ul> <p><b>Gastrointestinal and Renal Pharmacology</b></p> <ul style="list-style-type: none"> <li>• Antiemetics, proton pump inhibitors, H2 blockers in ICU</li> <li>• Drugs for acute GI bleeding (vasopressin, octreotide)</li> <li>• Laxatives and drugs for hepatic encephalopathy</li> <li>• Diuretics (loop, thiazide, potassium-sparing, osmotic) in emergency and ICU</li> </ul>	10

Unit IV	<p><b>Anti-Infective Pharmacology</b></p> <ul style="list-style-type: none"> <li>Principles of antimicrobial therapy in ICU</li> <li>Beta-lactam antibiotics, aminoglycosides, fluoroquinolones, macrolides, glycopeptides</li> <li>Antifungals and antivirals in critical care</li> <li>Antitubercular and anti-HIV agents (emergency considerations: IRIS, opportunistic infections)</li> <li>Sepsis pharmacology and antimicrobial stewardship</li> </ul> <p><b>Endocrine and Metabolic Pharmacology</b></p> <ul style="list-style-type: none"> <li>Insulin and oral hypoglycemic agents in emergency (DKA, HHS)</li> <li>Corticosteroids in shock, ARDS, anaphylaxis, and cerebral edema</li> <li>Thyroid drugs (thyrotoxic crisis, myxedema coma)</li> <li>Calcium, magnesium, and electrolyte replacement therapy in ICU</li> </ul>	10
Unit V	<p><b>Toxicology and Antidotes</b></p> <ul style="list-style-type: none"> <li>General principles of poisoning management</li> <li>Antidotes: naloxone, flumazenil, N-acetylcysteine, atropine, pralidoxime, ethanol/fomepizole</li> <li>Heavy metal poisoning (lead, mercury, arsenic) and chelators</li> <li>Snake bite and scorpion sting management pharmacology</li> <li>Organophosphate and pesticide poisoning drugs</li> </ul> <p><b>Critical Care-Specific Pharmacology</b></p> <ul style="list-style-type: none"> <li>Blood products and plasma expanders (colloids, crystalloids, albumin)</li> <li>Anticoagulants (heparin, LMWH, warfarin, DOACs) and reversal agents</li> <li>Thrombolytics (streptokinase, alteplase, tenecteplase)</li> <li>Immunosuppressants and biologics in ICU (monoclonal antibodies, cytokine inhibitors)</li> <li>Pharmacology of nutrition: parenteral and enteral feeding supplements</li> <li>Drug dosing in renal and hepatic failure</li> </ul>	15

<p><b>Practical Skills</b> (lab/clinical/simulation)</p>	<p><b>Emergency Drug Preparation &amp; Administration</b></p> <ul style="list-style-type: none"> <li>Crash cart orientation (adrenaline, atropine, amiodarone, dopamine, noradrenaline, vasopressin, etc.)</li> <li>Preparation, dilution, compatibility, and administration routes (IV bolus, infusion, intraosseous).</li> <li>Hands-on: Preparing adrenaline infusion, dopamine infusion, and sodium bicarbonate.</li> </ul> <p><b>Advanced Cardiac Life Support (ACLS) Drugs</b></p> <ul style="list-style-type: none"> <li>Practical demonstration of drug use in cardiac arrest (adrenaline, amiodarone, lidocaine, magnesium sulfate).</li> <li>Mock code blue scenarios – timing and sequence of drug administration.</li> <li>Simulation: Role of drugs in pulseless VT/VF, asystole, PEA.</li> </ul> <p><b>Airway &amp; Sedation Pharmacology</b></p> <ul style="list-style-type: none"> <li>Practical selection and dosing of induction agents (etomidate, ketamine, propofol, thiopentone).</li> <li>Neuromuscular blockers (succinylcholine, rocuronium, vecuronium).</li> <li>Simulation: Rapid sequence intubation (RSI) drug sequence.</li> </ul> <p><b>Pain &amp; Analgesia in Emergency/ICU</b></p> <p>Practical use of opioids (morphine, fentanyl, remifentanyl) and non- opioid analgesics.</p> <ul style="list-style-type: none"> <li>WHO analgesic ladder in trauma and burns.</li> <li>Hands-on: PCA (patient-controlled analgesia) pump demonstration.</li> </ul> <p><b>Antimicrobials &amp; Sepsis Pharmacology</b></p> <ul style="list-style-type: none"> <li>Practical principles of antibiotic selection in sepsis.</li> <li>Empirical vs targeted therapy, ICU antibiotic stewardship.</li> <li>Simulation: Choosing first-line antibiotics in septic shock.</li> </ul> <p><b>Antidotes &amp; Poisoning Management</b></p> <ul style="list-style-type: none"> <li>Practical handling of antidotes (naloxone, flumazenil, atropine, pralidoxime, N-acetylcysteine, digoxin Fab).</li> <li>Simulation cases: OP poisoning, opioid overdose, paracetamol toxicity.</li> <li>Dosage calculations and infusion preparation.</li> <li>Managing a patient on multiple drug infusions.</li> </ul>	<p>60</p>
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	<b>ICU Infusion Protocols &amp; Monitoring</b> <ul style="list-style-type: none"> <li>• Inotropes and vasopressors: preparation, titration, monitoring.</li> <li>• Insulin infusion protocols in DKA and hyperkalemia.</li> <li>• Electrolyte correction: Potassium, magnesium, calcium infusion.</li> </ul>	
	<b>Total Hours</b>	<b>120 Hours</b>

### Reference Book

- Tripathi KD. **Essentials of Medical Pharmacology**. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2019.
- Garg GR, Gupta S. **Review of Pharmacology**. 12th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.
- Katzung BG, Vanderah TW. **Basic and Clinical Pharmacology**. 15th ed. New York: McGraw-Hill Education; 2021.
- Brunton LL, Knollmann BC, Hilal-Dandan R. **Goodman & Gilman's The Pharmacological Basis of Therapeutics**. 13th ed. New York: McGraw-Hill Education; 2017.
- Ritter JM, Flower RJ, Henderson G, Loke YK, MacEwan DJ, Rang HP. **Rang and Dale's Pharmacology**. 9th ed. Edinburgh: Elsevier; 2019.
- Bennett PN, Brown MJ, Sharma P. **Clinical Pharmacology**. 12th ed. Edinburgh: Elsevier; 2018.

## 2. Critical Care Management

CL	CP	L	P
4	2	60	60

### Instructors In charge:

Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This advanced-level course is designed to bridge the gap between prehospital emergency care and critical care transport by providing paramedics with in-depth knowledge of intensive care concepts and patient management strategies. The course focuses on the pathophysiology, monitoring, and advanced interventions required for critically ill and hemodynamically unstable patients.

**Objectives:** At the end of the semester, the student should be able to:

- To impart knowledge of principles and practices of critical care management in the emergency setting.
- To develop skills for initial stabilization, resuscitation, monitoring, and advanced management of critically ill patients.
- To integrate evidence-based medicine in ICU and ED critical care practice.
- To train in multidisciplinary team approach, communication, and ethical aspects of critical care.

**Course Plan:**

Unit	Topic / Module	Hours
1	<p><b>Introduction to Critical Care</b></p> <ul style="list-style-type: none"> <li>• Definition &amp; scope of critical care in Emergency Medicine</li> <li>• ICU setup and organization</li> <li>• ICU triage, admission, and discharge criteria</li> <li>• Multidisciplinary roles in critical care</li> </ul> <p><b>Airway and Ventilatory Management</b></p> <ul style="list-style-type: none"> <li>• Advanced airway management</li> <li>• Mechanical ventilation: modes, initiation, monitoring, weaning</li> <li>• Non-invasive ventilation (NIV) &amp; high-flow nasal cannula (HFNC)</li> <li>• Oxygen therapy strategies</li> <li>• Ventilator-associated complications &amp; prevention</li> </ul>	10 Hours
2	<p><b>Hemodynamic Monitoring &amp; Shock Management</b></p> <ul style="list-style-type: none"> <li>• Basics of hemodynamic physiology</li> <li>• Types of shock (hypovolemic, cardiogenic, distributive, obstructive)</li> <li>• Monitoring tools: invasive (CVP, arterial line) &amp; non-invasive methods</li> <li>• Fluid therapy, vasoactive agents &amp; inotropes</li> <li>• Point-of-care ultrasound (POCUS) in shock</li> </ul> <p><b>Neurological Emergencies &amp; Critical Care</b></p> <ul style="list-style-type: none"> <li>• Traumatic brain injury management in ICU</li> <li>• Stroke and intracranial hemorrhage monitoring</li> <li>• Status epilepticus &amp; raised ICP management</li> <li>• Sedation, analgesia, and delirium in ICU</li> </ul>	15 Hours

Unit	Topic / Module	Hours
3	<p><b>Sepsis &amp; Multi-Organ Dysfunction</b></p> <ul style="list-style-type: none"> <li>• Pathophysiology of sepsis and septic shock</li> <li>• Sepsis bundles &amp; Surviving Sepsis Campaign guidelines</li> <li>• Organ support in MODS (renal replacement, hepatic dysfunction, ARDS)</li> <li>• Antimicrobial stewardship in ICU</li> </ul> <p><b>Toxicology &amp; Environmental Critical Care</b></p> <ul style="list-style-type: none"> <li>• Management of poisoning and drug overdose in ICU</li> <li>• Heat stroke, hypothermia, drowning</li> <li>• Envenomation &amp; anaphylaxis critical care</li> </ul>	15 Hours
4	<p><b>Trauma Critical Care</b></p> <ul style="list-style-type: none"> <li>• Initial resuscitation in polytrauma</li> <li>• ICU management of thoracic, abdominal, and pelvic trauma</li> <li>• Hemorrhage control, transfusion protocols (MTP)</li> <li>• Postoperative trauma ICU care</li> </ul> <p><b>Cardiovascular &amp; Respiratory Critical Care</b></p> <ul style="list-style-type: none"> <li>• Acute coronary syndromes, arrhythmias in ICU</li> <li>• Post-cardiac arrest care &amp; targeted temperature management</li> <li>• ARDS management strategies</li> <li>• ECMO &amp; advanced cardiopulmonary support</li> </ul>	10 Hours
5	<p><b>Renal, Endocrine &amp; Hematological Critical Care</b></p> <ul style="list-style-type: none"> <li>• AKI and renal replacement therapy</li> <li>• DKA &amp; HHS critical care management</li> <li>• Adrenal crisis &amp; thyroid emergencies</li> <li>• Coagulopathies, DIC, transfusion reactions</li> </ul> <p><b>Ethical &amp; Practical Aspects of Critical Care</b></p> <ul style="list-style-type: none"> <li>• End-of-life care, DNR orders, palliative aspects</li> <li>• ICU infections &amp; antibiotic stewardship</li> <li>• Communication with families in critical care</li> <li>• Simulation-based training: mock codes, airway drills, sepsis drills</li> </ul>	10 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<p><b>Airway &amp; Ventilation Skills</b></p> <ul style="list-style-type: none"> <li>• Endotracheal intubation (direct laryngoscopy, video laryngoscopy) – mannequins/simulation</li> <li>• Bag-mask ventilation, supraglottic airway insertion</li> <li>• Initiating mechanical ventilation, setting modes, alarms, and troubleshooting</li> <li>• Non-invasive ventilation (BiPAP, CPAP, HFNC demo)</li> </ul>	60 Hours

Unit	Topic / Module	Hours
	<p><b>Hemodynamic Monitoring &amp; Shock</b></p> <ul style="list-style-type: none"> <li>• Placement &amp; interpretation of arterial line, CVP line (simulation/skills lab)</li> <li>• Bedside ultrasound for IVC collapsibility, ejection fraction, pericardial effusion</li> <li>• Practical use of vasopressor infusion pumps</li> <li>• Shock management simulation (sepsis shock, cardiogenic shock, trauma shock)</li> </ul> <p><b>Neurological &amp; Sepsis Critical Care</b></p> <ul style="list-style-type: none"> <li>• GCS assessment &amp; pupillary reflex examination in ICU</li> <li>• ICP monitoring demo (simulation/virtual lab)</li> <li>• Sepsis bundle drill: fluid bolus, antibiotics, lactate monitoring, source control</li> </ul> <p><b>Trauma &amp; Cardiac Critical Care</b></p> <ul style="list-style-type: none"> <li>• Primary survey &amp; trauma resuscitation in simulation lab</li> <li>• Chest tube insertion demo</li> <li>• Massive transfusion protocol drill</li> <li>• Post-cardiac arrest care (airway, targeted temperature management)</li> </ul> <p><b>Renal, Endocrine &amp; Toxicology Critical Care</b></p> <ul style="list-style-type: none"> <li>• Bedside assessment of fluid status (POCUS demo)</li> <li>• Dialysis machine orientation (demo on CRRT/hemodialysis in ICU)</li> <li>• Insulin infusion protocols for DKA/HHS</li> <li>• Poisoning/overdose management (gastric lavage, antidote prep, IV lipid emulsion demo)</li> </ul> <p><b>Ethical, Communication &amp; Team Skills</b></p> <ul style="list-style-type: none"> <li>• Role-play on family counseling &amp; breaking bad news in ICU</li> <li>• Mock code blue (team-based CPR, defibrillator use, post-resuscitation care)</li> <li>• Documentation in critical care (ICU charts, consent forms, end-of-life notes)</li> </ul> <p><b>ICU Infusion Protocols &amp; Monitoring</b></p> <ul style="list-style-type: none"> <li>• Inotropes and vasopressors: preparation, titration, monitoring.</li> <li>• Insulin infusion protocols in DKA and hyperkalemia.</li> <li>• Electrolyte correction: Potassium, magnesium, calcium infusion</li> </ul>	
	<b>Total Hours</b>	<b>120 Hours</b>

### Reference book

- Irwin RS, Rippe JM. **Irwin and Rippe's Manual of Intensive Care Medicine**. 9th ed. Philadelphia: Wolters Kluwer; 2023.
- Parsons PE, Wiener-Kronish JP. **Critical Care Secrets**. 6th ed. Philadelphia: Elsevier; 2021.
- Hall JB, Schmidt GA, Wood LHD. **Principles of Critical Care**. 5th ed. New York: McGraw-Hill Education; 2022.
- Vincent JL, Abraham E. **Textbook of Critical Care**. 8th ed. Philadelphia: Elsevier; 2017.
- Walker BR, Colledge NR, Ralston SH, Penman ID. **Davidson's Principles and Practice of Medicine**. 24th ed. Edinburgh: Elsevier; 2022.
- Webb A, Angus D, Finfer S. **Oxford Handbook of Critical Care**. 4th ed. Oxford: Oxford University Press; 2020.

### 3. Toxicology

CL	CP	L	P
3	1	45	30

#### Instructors In charge:

Masters of Advance Care Paramedic or Equivalent with experience

#### Course Description

This course introduces students to the recognition, assessment, and pre-hospital management of toxicological and environmental emergencies. It emphasizes early identification, decontamination, antidote use, and the EMS provider's role in mass casualty and hazardous situations.

#### Objectives:

At the end of the semester, the student should be able to:

- To understand the epidemiology, pathophysiology, and clinical manifestations of common poisonings, drug overdoses, envenomation, and environmental emergencies.
- To manage toxicological and environmental emergencies in critically ill patients, including airway management, hemodynamic stabilization, and advanced monitoring.
- To recognize medico-legal responsibilities in poisoning cases, including proper documentation and communication with law enforcement.
- To foster reflective practice and continuous improvement in managing poisoning and environmental emergencies.

**Course Plan:**

Unit	Topic / Module	Hours
1	<p><b>General Principles of Toxicology</b></p> <ul style="list-style-type: none"> <li>• Definition, scope, and importance in emergency medicine</li> <li>• Poisoning epidemiology (India &amp; global)</li> <li>• Routes of exposure: ingestion, inhalation, injection, dermal</li> <li>• Principles of toxicokinetics &amp; toxicodynamics</li> <li>• General approach to a poisoned patient (ABCDE, decontamination, supportive care)</li> </ul>	10 Hours
2	<p><b>Common Poisons and Drug Overdose</b></p> <ul style="list-style-type: none"> <li>• <b>Household &amp; agricultural toxins:</b> organophosphates, carbamates, pyrethroids, rodenticides, kerosene poisoning, cleaning agents (phenols, acids/alkalis, bleach)</li> <li>• <b>Pharmaceutical overdoses:</b> paracetamol, salicylates, tricyclic antidepressants, benzodiazepines, opioids, antipsychotics, antiepileptics, digitalis, beta-blockers, calcium channel blockers, antitubercular drugs (isoniazid), hydroxychloroquine/chloroquine</li> <li>• <b>Alcohols &amp; substances of abuse:</b> ethanol, methanol, ethylene glycol, cannabis, cocaine, amphetamines, synthetic opioids, designer drugs (LSD, MDMA, ketamine)</li> </ul>	14 Hours
3	<p><b>Heavy Metal Toxicity</b></p> <ul style="list-style-type: none"> <li>• Lead, mercury, arsenic, cadmium, iron, copper, zinc phosphide, aluminium phosphide</li> <li>• Chelation therapy protocols</li> </ul> <p><b>Food &amp; Biological Toxins</b></p> <ul style="list-style-type: none"> <li>• Food poisoning: bacterial toxins (botulism, staphylococcal enterotoxin, Clostridium perfringens)</li> <li>• Mushroom poisoning: Amanita, Gyromitra, Psilocybin</li> <li>• Seafood/fish toxins: ciguatera, scombroid, tetrodotoxin, shellfish poisoning</li> <li>• Plant toxins: oleander, castor seeds (ricin), datura, aconite</li> </ul>	14 Hours

Unit	Topic / Module	Hours
4	<p><b>Environmental Emergencies</b></p> <ul style="list-style-type: none"> <li>• <b>Thermal injuries:</b> heat stroke, heat exhaustion, hypothermia, frostbite</li> <li>• <b>Electrical &amp; lightning injuries:</b> mechanisms, arrhythmias, burns, trauma</li> <li>• <b>Drowning and near drowning:</b> pathophysiology, resuscitation, complications</li> <li>• <b>High-altitude illness:</b> AMS, HAPE, HACE – recognition and management</li> <li>• <b>Barotrauma &amp; diving emergencies:</b> decompression sickness, arterial gas embolism</li> <li>• <b>Radiation exposure:</b> types, acute radiation syndrome, supportive and protective measures</li> <li>• <b>Blast and crush injuries</b></li> </ul> <p><b>Toxicological Emergencies in Special Populations</b></p> <ul style="list-style-type: none"> <li>• Pediatric poisoning</li> <li>• Geriatric poisoning</li> <li>• Pregnancy-related toxicology</li> <li>• Occupational &amp; industrial exposures</li> </ul>	10 Hours
5	<p><b>Envenomation &amp; Bites</b></p> <ul style="list-style-type: none"> <li>• <b>Snake bite envenomation</b> (neurotoxic, vasculotoxic, cytotoxic): first aid, antivenom therapy, complications</li> <li>• <b>Scorpion sting:</b> pathophysiology, cardiovascular complications, treatment</li> <li>• <b>Bee/wasp/hornet stings:</b> allergic reactions, anaphylaxis management</li> <li>• <b>Spider bites:</b> black widow, brown recluse</li> <li>• <b>Marine envenomation:</b> jellyfish, stingray, cone snail, sea snakes</li> <li>• <b>Dog/animal bites:</b> rabies prophylaxis, wound management, tetanus prophylaxis</li> </ul>	12 Hours

Unit	Topic / Module	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<b>Initial Stabilization &amp; Decontamination</b> <b>Skill stations / Simulation:</b> <ul style="list-style-type: none"> <li>• ABC management in poisoned patient (airway protection, rapid sequence intubation in OP poisoning)</li> <li>• Gastric lavage, activated charcoal administration, whole bowel irrigation</li> <li>• Skin/eye decontamination for chemical exposures</li> </ul> <b>Antidote Administration</b> <ul style="list-style-type: none"> <li>• Bedside demonstration: preparation and administration of <b>N acetylcysteine, atropine, pralidoxime, digoxin-specific Fab, naloxone, flumazenil, fomepizole</b></li> <li>• Dosing, infusion protocols, monitoring for adverse effects</li> </ul> <b>Case-Based Learning: Common Poisonings</b> <ul style="list-style-type: none"> <li>• Bedside / simulated cases:</li> <li>• Organophosphate poisoning with cholinergic crisis</li> <li>• Paracetamol overdose with NAC therapy planning</li> <li>• Opioid overdose and naloxone titration</li> <li>• Tricyclic antidepressant overdose with cardiac arrhythmias</li> </ul> <b>Environmental Emergencies Hands-on / Simulation:</b> <ul style="list-style-type: none"> <li>• Heat stroke management: cooling techniques, IV fluids, monitoring</li> <li>• Hypothermia: active and passive rewarming methods</li> <li>• Electrical &amp; lightning injury resuscitation drills</li> <li>• Drowning simulation: airway, resuscitation, secondary drowning recognition</li> </ul> <b>Toxicological Critical Care &amp; Special Procedures</b> <b>Simulation/bedside practice:</b> <ul style="list-style-type: none"> <li>• Enhanced elimination: indications for dialysis/hemoperfusion</li> <li>• Intravenous lipid emulsion therapy (for lipophilic drug toxicity)</li> <li>• Poison center call practice: documentation, medico-legal reporting</li> </ul>	60 Hours
	<b>Total Hours</b>	<b>120 Hours</b>

#### 4. Open Elective

##### Online Course Open Elective

Name of the Subject	Credits		Online Platform
	(L)	(P)	
Open Elective	2		SWAYAM, OnlineMedEd, Neptel, AMBOSS, Coursera



## Third Semester

### 1. Obstetric & Gynaecological Emergencies

CL	CP	L	P
4	2	60	60

**Instructors in charge:** Masters of Advance care Paramedic or Equivalent with experience.

#### Course Description

This course focuses on acute gynecological and obstetric conditions requiring emergency care, including childbirth and maternal complications. It includes hands-on simulations of obstetric interventions, hemorrhage control, EMS management of female reproductive emergencies and pre-hospital childbirth.

#### Learning Objectives

By the end of this course, students will be able to

- Describe the female reproductive system and pregnancy changes.
- Recognize and manage emergency situations in pregnant women.
- Assist safely in normal deliveries in pre-hospital settings.
- Handle complications like bleeding, breech delivery, or eclampsia.
- Practice childbirth drills and know when to refer to a hospital.

#### Course Plan

Units	Topics	Hours
1	<b>Obstetric Emergencies and Antenatal Care</b> Anatomy of the Female Reproductive System, Menstrual Cycle Phases -Follicular Phase, Ovulatory Phase, Luteal Phase, Hormonal Regulation in Reproductive Cycle, Maternal Adaptations in Pregnancy, Antenatal Assessment History and Physical Examination, Ultrasound and Lab Investigations Abortion, Hypertensive Emergencies in Pregnancy-Gestational Hypertension, Severe Pre-eclampsia, Eclampsia, Antepartum Hemorrhage - Placenta Previa, Abruptio Placentae, Amniotic Fluid Embolism, Preterm Labor and PROM (Premature Rupture of Membranes), Cardiac Complications in Pregnancy -Congenital Heart Disease, Peripartum Cardiomyopathy	15 Hours

Units	Topics	Hours
2	<b>Emergency Childbirth (Field Deliveries)</b> Expected Vaginal Delivery in an Ambulance, Postpartum Hemorrhage (PPH), Uterine Rupture, Breech Presentation, Shoulder Dystocia, Multiple Gestation Delivery, Cord Prolapse, Trauma in Pregnancy, Assisted Vaginal Delivery (Forceps/Vacuum), Perimortem Caesarean Section, Cardiopulmonary Arrest in Pregnancy, Neonatal Assessment, Neonatal Resuscitation and Stabilization, Neonatal Handover Coordination with Receiving Facility.	15 Hours
3	<b>Gynaecological Emergencies</b> Ectopic Pregnancy, Pelvic Inflammatory Disease (PID), Acute Endometriosis Flare, Pelvic Mass with Acute Pain, Urinary Retention or Incontinence Related to Gynaecologic Conditions, Acute Abdominal Pain of Gynaecologic Origin, Ovarian Torsion, Ruptured Ovarian Cyst, Menorrhagia / Dysfunctional Uterine Bleeding (DUB), Anemia-Related Emergency Stabilization, Gynecological Trauma - Road Traffic Accidents (RTA), Sexual Assault, Sexual Assault and Forensic Evidence Preservation, EMS Role in Early Pregnancy Loss and Emotional Support, Psycho social Emergencies Related to Reproductive Health	15 Hours
4	<b>Preterm Labour</b> <ul style="list-style-type: none"> <li>Etiology</li> <li>Clinical Courses Management</li> </ul> <b>Premature Rupture of the Membranes Intrauterine Foetal Death</b> <ul style="list-style-type: none"> <li>Medical, Surgical, Combined</li> </ul> <b>Pharmacotherapeutics in Obstetric Trauma in Pregnancy</b> <ul style="list-style-type: none"> <li>Mechanism</li> <li>Assessment and Management</li> </ul> <b>Emergency Department Cesarean Section</b>	15 Hours
<b>Practical Skills</b> (lab/clinical /simulation)	Antenatal assessment & Normal Delivery PPH simulation with uterine massage + uterotonics Obstetric drills: breech, eclampsia, dystocia, twin delivery Advanced Skills-Forceps and Vacuum Delivery	60 Hours
<b>Total</b>		<b>120 Hours</b>

**Reference textbooks:**

- Advanced Medical Life Support (AMLS) Provider Manual, 4th Ed. (NAEMT, 2022)
- Clinical Obstetrics and Gynecology, 5th Ed. (2022) – Brian A. Magowan
- Emergency Care in Obstetrics and Gynecology (2023) – Joseph S. Sanfilippo et al.
- DC Dutta’s Textbook of Obstetrics – Hiralal Konar| 10th Ed. (2023)
- Manual of Obstetrics – Shirish N Daftary & Narendra Malhotra

**2. Pediatric Emergencies**

CL	CP	L	P
4	2	60	60

**Instructors In charge:**

M.D paediatrics/ Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This course explores emergency care principles for neonates and children, focusing on age-specific assessment, vital signs, trauma, infectious diseases, and resuscitation protocols. Pediatric Advanced Life Support (PALS) and Neonatal Resuscitation techniques are emphasized.

**Objectives:** At the end of the semester, the student should be able to:

- List the age-appropriate differential diagnosis and initial diagnostic and therapeutic plan for pediatric patients presenting with each of the following laboratory findings: anemia, hematuria, proteinuria, and positive Mantoux skin test (PPD).
- Describe the epidemiology, clinical, laboratory, and radiographic findings, of each of the core pediatric level conditions listed for each presenting complaints.

**Course Plan:**

Unit	Topic / Module	Hours
1	<b>Comparative anatomy:</b> Comparative anatomy between adult & pediatric History taking and pediatric assessment <ul style="list-style-type: none"> <li>• Developmental milestones</li> <li>• Anthropometry</li> </ul>	5 Hours

Unit	Topic / Module	Hours
2	Neonatal resuscitation Pediatric resuscitation Assessment of newborn and pediatric <ul style="list-style-type: none"> <li>• <b>Special condition</b></li> <li>• Acidosis</li> <li>• Meconium aspiration</li> <li>• Diaphragmatic hernia</li> <li>• Apnea</li> <li>• Burns</li> <li>• Drowning</li> <li>• SIDS (Sudden Infant Death Syndrome)</li> </ul>	15 Hours
3	<b>Premature baby</b> <b>Pediatric fluid and metabolic derangements</b> <ul style="list-style-type: none"> <li>• Hypoglycemia,</li> <li>• DKA</li> <li>• Dehydration</li> <li>• Fluid therapy</li> </ul> <b>Management of Injured child</b> <ul style="list-style-type: none"> <li>• Primary survey</li> <li>• Resuscitation</li> <li>• Secondary survey</li> <li>• Emergency treatment</li> </ul>	15 Hours
4	<b>Neurological emergencies</b> <ul style="list-style-type: none"> <li>• Neonatal Seizure</li> <li>• Febrile convulsion</li> <li>• Meningitis</li> </ul>	5 Hours
5	<b>Respiratory emergencies:</b> <ul style="list-style-type: none"> <li>• Foreignbody obstruction</li> <li>• Asphyxia neonatorum</li> <li>• Bronchiolitis</li> <li>• Pneumonia</li> <li>• Asthma</li> <li>• Croup</li> <li>• Epiglottitis</li> </ul> <b>Cardiovascular emergencies:</b> <ul style="list-style-type: none"> <li>• Shock</li> <li>• Arrhythmias</li> </ul>	15 Hours
6	<b>Gastrointestinal emergencies</b> <ul style="list-style-type: none"> <li>• Diarrhea</li> <li>• Abdominal pain</li> </ul>	5 Hours

Unit	Topic / Module	Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>History taking, Examination and Presentation of Pediatric Case</li> <li>PALS, NALS</li> <li>Simulation case scenarios</li> </ul>	
	<b>Total Hours</b>	<b>120 Hours</b>

**Text books:**

- Nelson Textbook of paediatrics 18<sup>th</sup> edition, Kliegman ,Behrman,Jenson-Saunders Elsevier
- Care of new born –6<sup>th</sup> edition, Meharban Singh-Sagar

**Reference books:**

- Essential Pediatrics-7<sup>th</sup> edition O.P. Ghai, VinodK.Paul-CBS publisher
- IAP book of pediatrics,3<sup>rd</sup> edition, A.Parthasarathy, Nair-Jaypee

### 3. Advanced Medical Emergencies

CL	CP	L	P
4	2	60	60

**Instructors In charge:**

Masters of Advance Care Paramedic or Equivalent with experience

**Course Description:** This advanced course introduces students to the recognition, assessment, and pre-hospital management of Medical emergencies.

**Objectives:** At the end of the semester, the student should be able to:

- Analyze and manage acute cardiovascular and neurological emergencies.
- Identify and treat infectious diseases in emergency settings.
- Apply critical thinking in triage, stabilization, and transport of patients with complex medical conditions.

**Course Plan:**

Unit	Topic / Module	Hours
1	<b>Cardiovascular Emergencies</b> Acute Coronary Syndromes such as STEMI and NSTEMI, Cardiac Arrest and Resuscitation following ACLS protocols, Congestive Heart Failure and Pulmonary Edema, Hypertensive Crisis including malignant hypertension and hypertensive encephalopathy, Aortic Dissection and Aneurysm, Cardiac Tamponade, and ECG Interpretation in Emergencies covering arrhythmias, Ischemic changes, and conduction blocks. Cardiogenic shock, pacemaker and ICD malfunction management, emergency pharmacology for cardiovascular support, Pre-hospital thrombolysis, use of point-of-care ultrasound (POCUS) for cardiac assessment, and transport considerations for unstable cardiac patients.	15 Hours
2	<b>Central Nervous System Emergencies</b> Stroke syndromes such as ischemic stroke, hemorrhagic stroke, and transient ischemic attacks, Seizures and Status Epilepticus, Meningitis and Encephalitis, Traumatic Brain Injury including concussion and intracranial hemorrhage, Coma and Altered Mental Status, and Spinal Cord Injuries. Advanced EMS-relevant topics include neurogenic shock, cerebral herniation syndromes, pre-hospital neurological assessment tools such as the Glasgow Coma Scale and NIH Stroke Scale, management of CNS infections in immunocompromised patients, and protocols for rapid transport to neurocritical care centers.	15 Hours
3	<b>Infectious Disease Emergencies</b> Sepsis and Septic Shock, COVID-19 and other emerging viral infections, Dengue, Malaria, Typhoid, Leptospirosis, Tuberculosis including MDR and XDR strains, and HIV/AIDS-related emergencies. EMS-specific topics include infection control protocols, PPE usage and decontamination, outbreak response and containment strategies, prehospital isolation procedures, and transport logistics for infectious patients. The unit also covers antimicrobial stewardship in emergency settings, recognition of bio-threat agents, and coordination with public health authorities during infectious disease outbreaks.	15 Hours

Unit	Topic / Module	Hours
4	<b>Integrated Emergency Protocols</b> Emergency Pharmacology for CVS, CNS, and infectious conditions, Triage and Risk Stratification Tools such as NEWS2, qSOFA, and MEWS, Transport and Referral Guidelines for critically ill patients, Ethical and Legal Aspects in infectious disease and neurological emergencies, and Case-based Discussions using clinical algorithms. Advanced EMS topics include coordination with trauma and stroke networks, use of mobile health technologies for remote monitoring, documentation standards in emergency care, and simulation-based training for multi-system emergencies.	15 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	ECG Interpretation and Arrhythmia Recognition Stroke Assessment Tools (NIHSS, FAST) Sepsis Bundle Implementation PPE Donning and Doffing Emergency Drug Kit Familiarization Simulation: Cardiac Arrest, Stroke, Sepsis Case Presentations and OSCEs	60 Hours
	<b>Total Hours</b>	<b>120 Hours</b>

#### Textbooks & References

- Tintinalli's Emergency Medicine, 9th Edition
- Rosen's Emergency Medicine, 9th Edition
- Harrison's Principles of Internal Medicine, CVS & CNS sections
- CDC/WHO Guidelines on Sepsis, and Emerging Infections
- AHA ACLS Provider Manual

#### 4. Open Elective

##### Online Course Open Elective

Name of the Subject	Credits		Online Platform
	(L)	(P)	
Open Elective	2		SWAYAM, OnlineMedEd, Neptel, AMBOSS, Coursera

## Fourth Semester

### 1. Emergency Clinical Procedures

CL	CP	L	P
4	2	60	60

**Instructors in charge:** M.D Emergency Medicine or Masters of Advance Care Paramedic or Equivalent with experience.

#### Course Description

This hands-on, skills-focused course is designed to enhance the competence and confidence of paramedics in performing critical emergency clinical procedures across a wide range of prehospital scenarios. Emphasizing both foundational and advanced interventions, the course integrates evidence-based practices with real-world application to improve patient outcomes.

#### Learning Objectives

By the end of this course, students will be able to

- To implement emergency procedure correctly.
- Utilize appropriate knowledge, attitude and skills that the students learned in order to render right and appropriate emergency care.

#### Course Plan

Unit	Topics	Practical Hours
Unit I	<b>Respiratory Procedures</b> Basic and advanced adjunct Airway Management and Decision Making, Pharmacologic Adjuncts to Intubation, double lumen tracheal tube, Cricothyrotomy (Needle, Surgical), Percutaneous Trans laryngeal Ventilation, Tracheostomy Care, Thoracentesis, Tube Thoracotomy, Bronchoscopy	15 Hours
Unit II	<b>Cardiac Procedures</b> <ul style="list-style-type: none"><li>• Techniques for Supraventricular Tachycardia, Cardioversion, Assessment of Implantable Devices, Basic</li><li>• Electrocardiographic Techniques, Emergency Cardiac Pacing, Pericardiocentesis, Artificial Perfusion during Cardiac Arrest, Vascular techniques and volume support - Pediatric Vascular</li><li>• Access and Blood Sampling Techniques, Arterial Puncture and Cannulation, Setting up of transducer for arterial monitoring</li></ul>	25 Hours

Unit	Topics	Practical Hours
	<ul style="list-style-type: none"> <li>Central Venous Catheterization and Central Venous Pressure Monitoring, Venous Cut down, Alternative Methods of Drug Administration, Anesthetic and analgesic techniques - Local and Topical Anesthesia, Nerve Blocks of the Extremities, Systemic Analgesia and Sedation for Procedures</li> </ul>	
Unit III	<b>Soft Tissue Procedures</b> <ul style="list-style-type: none"> <li>Incision and Drainage Wound, Methods of Wound Closure, Burn Care Procedures, Gastrointestinal Procedures - Esophageal Foreign Bodies, Nasogastric and Feeding Tube Placement, snegstaken Blackmore tube, Balloon Tamponade of Gastro esophageal Varices (Decontamination of the Poisoned Patient, Peritoneal Procedures)</li> </ul>	10 Hours
Unit IV	<b>Neurologic Procedures</b> (Lumbar Puncture and Cerebrospinal Fluid Examination), Special Procedures, E-fast, Urological Procedures, Suprapubic Catheterization	10 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>Neurologic Procedures</li> <li>Soft Tissue Procedures</li> <li>Cardiac Procedures</li> <li>Respiratory Procedures</li> </ul>	60 Hours
<b>Total</b>	स्वास्थ्यम् सर्वार्थसाधनम्	120 Hours

#### Reference Books & Resources:

- Clinical Procedures in Emergency Medicine – Roberts and Hedges
- Tintinalli's Emergency Medicine: A Comprehensive Study Guide
- Emergency Procedures: A Handbook for Medical Professionals – Oxford University Press
- The ICU Book – Paul L. Marino (Ventilation, Mechanical support, and advanced procedures)
- Manual of Pediatric Emergency Procedures – Fleisher, Ludwig

## 2. Disaster Management

CL	CP	L	P
4	-	60	-

**Instructors in charge:** Masters of Advance Care Paramedic or Equivalent with experience.

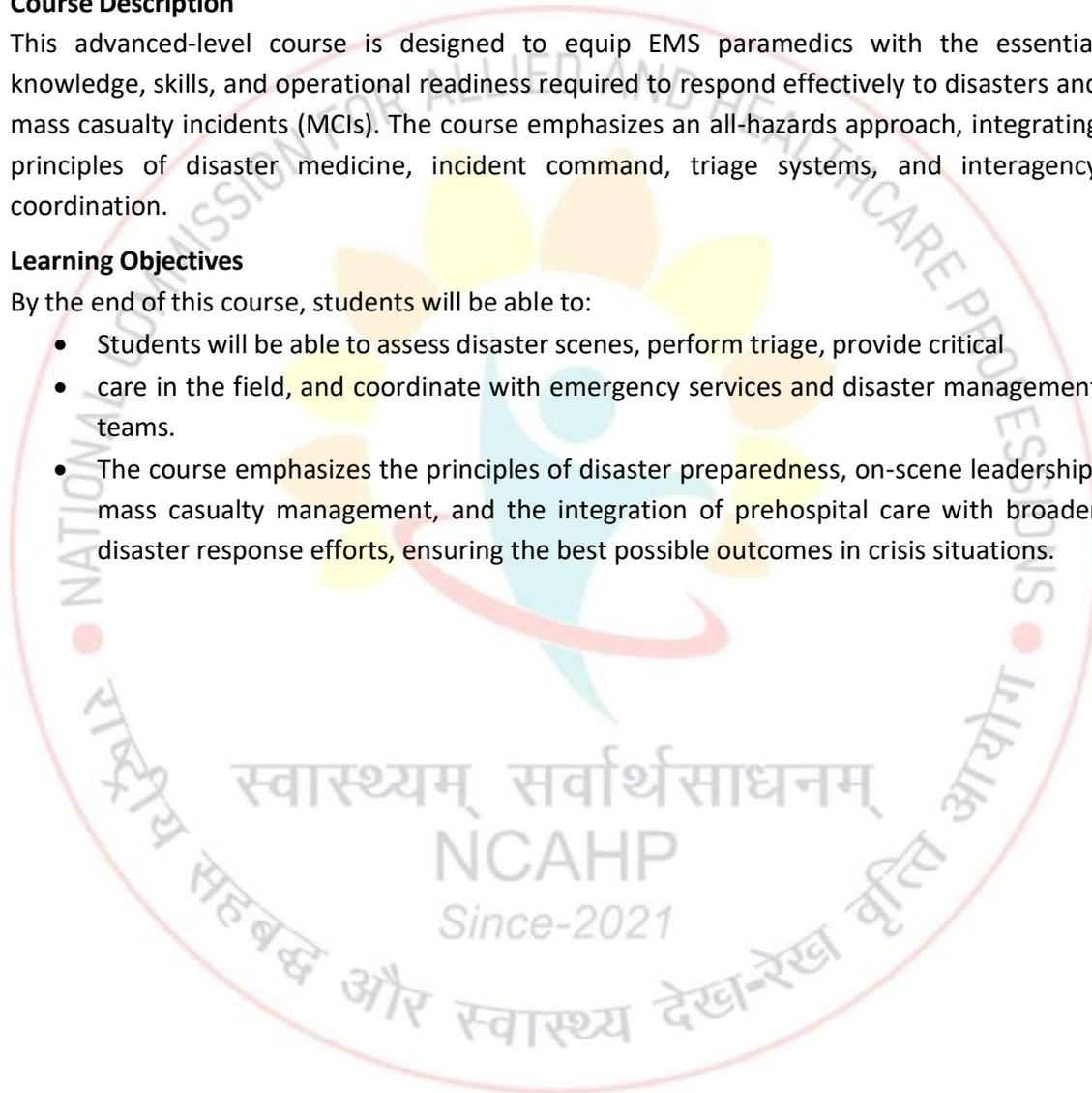
### Course Description

This advanced-level course is designed to equip EMS paramedics with the essential knowledge, skills, and operational readiness required to respond effectively to disasters and mass casualty incidents (MCIs). The course emphasizes an all-hazards approach, integrating principles of disaster medicine, incident command, triage systems, and interagency coordination.

### Learning Objectives

By the end of this course, students will be able to:

- Students will be able to assess disaster scenes, perform triage, provide critical care in the field, and coordinate with emergency services and disaster management teams.
- The course emphasizes the principles of disaster preparedness, on-scene leadership, mass casualty management, and the integration of prehospital care with broader disaster response efforts, ensuring the best possible outcomes in crisis situations.



## Course Plan

Unit	Topics	Hours
Unit I	<ul style="list-style-type: none"> <li>• Disasters and Mass-Casualty Incidents (MCIs)</li> <li>• Disaster management preparedness, planning, training, response, and after-action review</li> <li>• Types of Disaster- Natural and Man-made.</li> <li>• Incident command system (ICS)-Roles and Responsibilities</li> <li>• Medical Incident Command</li> <li>• EMS response within ICS,</li> <li>• Triage               <ul style="list-style-type: none"> <li>a) Triage principles</li> <li>b) Overview of triage systems (START, JumpSTART, SALT, etc.)</li> <li>c) Resource management</li> <li>d) Triage                   <ul style="list-style-type: none"> <li>i. Performing</li> <li>ii. Retriage</li> <li>iii. Destination decisions</li> <li>iv. Critical Incident Stress Management</li> <li>v. Post- traumatic and cumulative stress</li> </ul> </li> </ul> </li> <li>• Hospital disaster preparedness and planning</li> <li>• Public health emergencies and outbreak-driven disasters</li> <li>• Urban Search and Rescue (USAR) operations</li> </ul>	15 Hours
Unit II	<ul style="list-style-type: none"> <li>• Mass-Casualty Incidents Due to Terrorism and Disaster</li> <li>• Terrorism and weapons of mass destruction- Paramedic response,</li> <li>• Chemical/biological/Explosive/radiological/nuclear agents.</li> <li>• Railway accidents and derailment trauma</li> <li>• Terrorist bombing: blast injuries, scene safety, multi-casualty triage</li> <li>• Air crash disasters: triage, extrication, field stabilization</li> <li>• Maritime disasters and offshore rescue</li> <li>• Air crash disasters: triage, extrication, field stabilization</li> <li>• Tactical Emergency Medical Support (TEMS)</li> </ul>	15 Hours

Unit	Topics	Hours
Unit III	<ul style="list-style-type: none"> <li>Hazardous material incidents – Hazardous material scene size up/scene management, identification of hazardous material, contamination and Poisoning, chemical and toxicological terminology.</li> <li>Establishing Safety Zones</li> <li>Personal Protective Equipment</li> <li>Decontamination and treatment, medical monitoring and rehabilitation.</li> </ul>	15 Hours
Unit IV	<ul style="list-style-type: none"> <li>Crime scene awareness – Awareness, highway incidents, residential incidents, violence on streets, contact and cover, self- defense, crime scenes.</li> <li>Vehicle Extrication and Special Rescue</li> </ul>	15 Hours
	<b>Total</b>	<b>60 Hours</b>

#### Text Books

- Disaster medicine –2<sup>nd</sup> edition David E .Hogan, Jonathan-Lippincott Williams and Wilkins
- Rosens emergency medicine- Marx ,Hockberger Walls, Adams-Mosby Elsevier
- Ciottone’s Disaster Medicine, 3rd Edition – Gregory R. Ciottone

#### Reference Books

- EMS and disaster management – A holistic approach PK Dane
- Principles of Emergency Management and Emergency Operations Centers – Michael J. Fagel
- Nancy Caroline’s Emergency Care in the Streets – Latest Edition
- Disaster Response and Recovery: Strategies and Tactics for Resilience – David A. McEntire

### 3. Advanced Medical Emergencies -II

CL	CP	L	P
4	2	60	60

**Instructors in charge:** M.D Emergency Medicine

Masters of Advance Care Paramedic or Equivalent with experience.

## Course Description

This course teaches how to approach and manage patients with life-threatening conditions such as respiratory distress, acute kidney injury, diabetic emergencies, and other critical illnesses in the emergency department and EMS settings.

## Learning Objectives

By the end of this course, students will be able to:

- Assess and manage patients with respiratory failure and distress.
- Diagnose and treat patients with acute kidney injury and chronic kidney disease.
- Recognize and manage endocrine emergencies.
- Interpret and arterial blood gas (ABG) analysis and manage fluid and electrolyte imbalances

## Course Plan

Unit	Topics	Hours
Unit I	<b>Respiratory Emergencies</b> <ul style="list-style-type: none"><li>• Approach of Respiratory distress patients. Respiratory failure.</li><li>• Asthma and status asthmaticus. Chronic Obstructive Pulmonary Disease. Upper Respiratory Tract Infections Pneumonia.</li><li>• Tuberculosis.</li><li>• Hemoptysis.</li></ul>	15 Hours
Unit II	<ul style="list-style-type: none"><li>• Interpretation of Chest X-ray.</li><li>• Basic concepts and Modes of mechanical ventilation Parameters and Graphs of mechanical ventilation Acute Respiratory Distress Syndrome.</li><li>• Non cardiogenic Pulmonary Edema Pulmonary Thromboembolism Spontaneous pneumothorax.</li><li>• Pleural effusion.</li></ul>	15 Hours
Unit III	<b>Renal Emergencies</b> <ul style="list-style-type: none"><li>• Acute kidney Injury</li><li>• Chronic Kidney Disease</li><li>• Renal Replacement Therapy (Hemodialysis, CRRT, SLED) Urinary Tract Infections &amp; Hematuria</li><li>• Rhabdomyolysis Renal stone disease.</li><li>• Testicular Torsion &amp; Epididymitis</li></ul>	10 Hours

Unit	Topics	Hours
Unit IV	<b>Endocrine Emergencies</b> <ul style="list-style-type: none"> <li>• Hypoglycemia Diabetic Ketoacidosis</li> <li>• Hyperosmolar Hyperglycemic State Hypothyroidism and Myxedema Crisis Hyperthyroidism and Thyroid storm</li> <li>• Adrenal Insufficiency</li> </ul>	10 Hours
Unit V	<b>Metabolic Emergencies</b> <ul style="list-style-type: none"> <li>• Fluid Management</li> <li>• Analysis and interpretation of ABG Metabolic acidosis and alkalosis Respiratory acidosis and alkalosis Hyponatremia &amp; Hypernatremia Hypokalemia &amp; Hyperkalemia Hypocalcemia &amp; Hypercalcemia</li> <li>• Hypomagnesemia &amp; Hypermagnesemia</li> </ul>	10 Hours
<b>Practical Skills</b> (lab/clinical/simulation)	<ul style="list-style-type: none"> <li>• Assessment of respiratory distress patients</li> <li>• Administration of drugs through nebulization</li> <li>• Interpretation and detect abnormalities in chest X-ray</li> <li>• Initiation of invasive &amp; non-invasive mechanical ventilation</li> <li>• Weaning and extubation of ventilating patients</li> <li>• Needle thoracocentesis</li> <li>• Assist tube thoracostomy</li> <li>• Assist and monitoring of hemodialysis</li> <li>• Urinary catheterization</li> <li>• Perform ABG (Arterial Blood Gas) sampling</li> </ul>	60 Hours
	<b>Total</b>	<b>120 Hours</b>

**Text Book/Reference Books:**

- **Tintinalli's Emergency Medicine:** A Comprehensive Study Guide, 9<sup>th</sup> edition
- **Rosen's Emergency Medicine:** Concepts and Clinical Practice, 10<sup>th</sup> Edition
- **Nancy Caroline's Emergency Care in the Streets,** 9<sup>th</sup> Edition

**4. Dissertation**

CL	CP	L	P
-	4	-	120

**Instructors in charge:** Masters of Advance Care Paramedic or Equivalent with experience.

**Course Description:** This course teaches how to choose a research topic, plan and carry out their study, analyze data, and write a clear dissertation. It also teaches how to prepare research papers for journals, including tips on writing, publishing, and handling feedback.

**Objectives:** At the end of the course the students will acquire knowledge in the following aspects-

- Select a clear and focused research topic and make good research questions.
- Plan and carry out research using proper methods and tools.
- Understand and explain research results clearly in writing.
- Write research papers for journals and handle the publication process.

### Course Plan

Unit	Practical Topics	Hours
1 Identification, Research Framing & Literature Review	<ul style="list-style-type: none"> <li>• Identification of dissertation topic Classification of the type of dissertation</li> <li>• Defining and outlining a research area with a clear Research question Identifying the leading issues</li> <li>• Prepare an overview of the topic Prior research</li> <li>• Prepare a rationale for the paper</li> <li>• Identify the context of the topic</li> </ul>	24
2 Research Design & Methodology	<ul style="list-style-type: none"> <li>• Describe the methodology used in detail Identify the tools required for the research Ensure the reproducibility of the methods Identify control group and include those data Identify inclusion and exclusion criteria</li> <li>• Use all available tools for detailed acquisition of data Identify modern software for statistical and data analysis</li> </ul>	24
3 Data Analysis & Presentation	<ul style="list-style-type: none"> <li>• Describe the type of analysis used</li> <li>• Add pictures and tables for data representation Include results of your research questions</li> <li>• Provide a concise summary of each relevant result, both positive and negative</li> <li>• Describe a brief statement of how each result relates to the question, or whether the hypothesis was supported</li> <li>• whether the hypothesis was supported</li> <li>• Describe recurring points of agreement or disagreement Describe patterns and trends</li> <li>• Identify particularly significant snippets from individual responses</li> </ul>	24

Unit	Practical Topics	Hours
4 Findings, Interpretation & Critical Discussion	<ul style="list-style-type: none"> <li>Describe a clear statement of the principal findings Discuss the implications of the findings realistically.</li> <li>State whether the results prove or disprove the hypothesis.</li> <li>Introduce new or expanded ways to think about the research question Discuss possible consequences if the problem is avoided</li> </ul>	24
5 Research Paper Writing & Journal Publication	<ul style="list-style-type: none"> <li>Structuring a research paper</li> <li>Adhering to journal guidelines and formatting standards</li> <li>Ethical considerations in publishing (authorship, plagiarism, data integrity) Selecting appropriate journals for submission (impact factor, scope, audience) Understanding the peer review process</li> <li>Strategies for effective revision and resubmission Open access vs. traditional publishing options</li> </ul>	24
	<b>Total</b>	<b>120 Hours</b>

#### Text Book/Reference Books:

- Introduction to biostatistics and research methods by P.s.sundarrao and J.Richard,phd - 5th Edition
- The Craft of Research by Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams-5th Edition.

### Credits and Assessment Outline

#### First Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
<b>MACP 101</b>	Pre-Hospital Care Management	3	2	5	45	60	105	50	150	200
<b>MACP 102</b>	Musculoskeletal Emergencies	3	2	5	45	60	105	50	150	200
<b>MACP 103</b>	Surgical Emergencies	3	2	5	45	60	105	50	150	200
<b>MACP 104</b>	Research Methodology and Bio statistics	4	-	4	60	-	75	50	150	200
	Clinical Rotation 1		4	4	60		60			
	<b>Total</b>	<b>13</b>	<b>10</b>	<b>23</b>	<b>255</b>	<b>180</b>	<b>450</b>	<b>200</b>	<b>600</b>	<b>800</b>

## Second Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
MACP 201	Pharmacology	4	2	6	60	60	120	50	150	200
MACP 202	Critical Care Management	4	2	6	60	60	120	50	150	200
MACP 203	Toxicology	4	2	6	60	60	120	50	150	200
MACP 204	Open Elective	2	-	1	30	-	30	-	-	-
	Clinical Rotation 2		4	4	60		60			
<b>Total</b>		<b>14</b>	<b>10</b>	<b>23</b>	<b>270</b>	<b>180</b>	<b>450</b>	<b>150</b>	<b>450</b>	<b>600</b>

## Third Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
MACP 301	Obstetric and Gynecological Emergencies	4	2	6	60	60	120	50	150	200
MACP 302	Pediatric Emergencies	4	2	6	60	60	120	50	150	200
MACP 303	Advanced Medical Emergencies Part- I	4	2	6	60	60	120	50	150	200
MACP 304	Open Elective	2	-	1	30	-	-	-	-	-
	Clinical Rotation 3		4	4	60		60			
<b>Total</b>		<b>14</b>	<b>10</b>	<b>23</b>	<b>270</b>	<b>180</b>	<b>420</b>	<b>150</b>	<b>450</b>	<b>600</b>

## Fourth Semester

Course code	Course Titles	Credits/Week			Hours/Semester			Assessments		Total (IA+UE)
		L	P	C	L	T/P	Total	IA*	UE**	
MACP 401	Emergency Clinical Procedure	4	2	6	60	60	120	50	150	200
MACP 402	Disaster Management and Industrial Emergency	4	-	4	60	-	60	50	150	200
MACP 403	Advanced Medical Emergencies - II	4	2	6	60	60	120	50	150	200
MACP 404	Dissertation	-	4	4		120	120	50	50(Viva)	100
	Clinical Rotation 4		4	4	60		60			
<b>Total</b>		<b>12</b>	<b>12</b>	<b>24</b>	<b>240</b>	<b>240</b>	<b>480</b>	<b>200</b>	<b>450</b>	<b>700</b>

Distribution of marks for Internal and External assessments will be based on the credit distribution of the theory and practical for the courses. For eg. If a course has 3 credits for Lecture and 0.5 credits for Practicals, 25 marks for theory and 5 marks for practical will be considered for internal assessments out of the 50 marks. Similar ratios will be followed for External assessments.

For Practical examinations, an internal and external examiner will assess the candidates.

Research Project: An internal and external examiner will assess the candidates for the final evaluation with PhD (Preferably in the relevant disciplines of emergency care) should be the examiner for assessment of research projects.



## PhD Guidelines

Minimum Standards and Procedure for Award of Ph.D. Degree:

- Every University established or incorporated by or under a Central Act, a Provincial Act, or a State Act, and every Institution Deemed to be a University under Section 3 of UGC Act, 1956 and every degree-granting autonomous College and every affiliated college, allowed to offer Ph.D. programmes.
- Candidates for admission to the Ph.D. programme shall have successfully completed:
- A 2-year/4-semester Master's degree programme, (after 4 year undergraduate degree) with at least 55% marks in aggregate or its equivalent grade 'B' (or an equivalent grade in a point scale wherever grading system is followed) or an equivalent degree from a foreign educational institution accredited by an Assessment and Accreditation Agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of educational institutions.
- A candidate seeking admission after a 4-year/8-semester Bachelor's degree with Research should have a minimum CGPA of 7.0/10.
- A relaxation of 5% of marks, from 55% to 50%, or an equivalent relaxation of grade, may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-Abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the Commission from time to time.
- **Note:** The eligibility marks of 55% (or an equivalent grade in a point scale wherever grading system is followed) and the relaxation of 5% to the categories mentioned above are permissible based only on the qualifying marks without including the grace mark procedures, if any.
- A relaxation of 0.5 score in CGPA or an equivalent relaxation of grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-Abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the Commission from time to time.
- Ph.D. programme shall be for a minimum duration of two years excluding course work or minimum of 3 years including course work, and a maximum of six years
- Extension beyond the above limits will be governed by the relevant clauses as stipulated in the Statute/Ordinance of the individual Institution concerned, but not beyond more than two years or 3 years as mentioned above
- All Universities shall admit Ph.D. Scholars through a National Eligibility Test (NET) or National Entrance Test or an Entrance test/exit exam conducted by NCAHP.
- Eligibility criteria to be a Research Supervisor, Co-Supervisor, Number of Ph.D. scholars permissible per Supervisor, etc

- Any regular Professor/Associate Professor of the University/ College, with at least five research publications in peer-reviewed or refereed journals after obtaining PhD and any regular Assistant Professor of the university/ college with a minimum of five years teaching/research experience with a Ph.D. degree and at least **three** research publications in peer-reviewed or refereed journals may be recognized as Research Supervisor.
- Provided that in areas/disciplines where there is no or only a limited number of peer-reviewed or refereed journals, the Institution may relax the above condition for recognition of a person as Research Supervisor with reasons recorded in writing.
- Only a full-time regular teacher of the University/ College concerned can act as a Research Supervisor. Adjunct faculties are not permitted to be Research Supervisors except being Co-supervisor. However, Co-Supervisors from within the same department or other departments of the same institution or sister institutions may be permitted with the approval of the Research Advisory Committee.
- In specific cases of a formal institutional collaboration based on the MoUs, the Universities/Colleges concerned may approve a faculty member as Research Supervisor/Co-Supervisor for a Ph.D. candidate from the collaborating institution.
- In the case of topics which are inter-disciplinary and where the Department concerned feels that the expertise in the Department has to be supplemented from outside, the Department may appoint a Research Supervisor from the Department itself, who shall be known as the Research Supervisor, and a Co-Supervisor from outside the Department/ Faculty/College/University on such terms and conditions as may be specified and agreed upon by the consenting Institutions
- The allocation of Research Supervisor for a selected research scholar shall be decided by the Department concerned depending on the number of scholars per Research Supervisor, the available specialization among the Supervisors, and research interests of the scholars as indicated by them at the time of interview
- A Research Supervisor/Co-Supervisor who is a professor cannot guide more than eight (8) Ph.D. scholars at any given point of time. An Associate Professor as Research Supervisor can guide up to a maximum of six (6) Ph.D. scholars (including co-supervision) and an Assistant Professor as Research Supervisor can guide up to a maximum of four (4) Ph.D. scholars. One additional research scholar can be allotted to each supervisor over and above the allotted number provided the Research Supervisor is implementing a major sponsored research project. Further, each Research Supervisor/Co-Supervisor can guide two international students on a supernumerary basis. At any point of time the total number of candidates under a research supervisor shall not exceed the number as prescribed above including the candidates under co-supervision.
- **Note:** The Research Supervisor should declare the number of Ph.D. scholars registered with him/her periodically to the University/College. He/she cannot increase the number by using recognition from multiple universities/colleges.

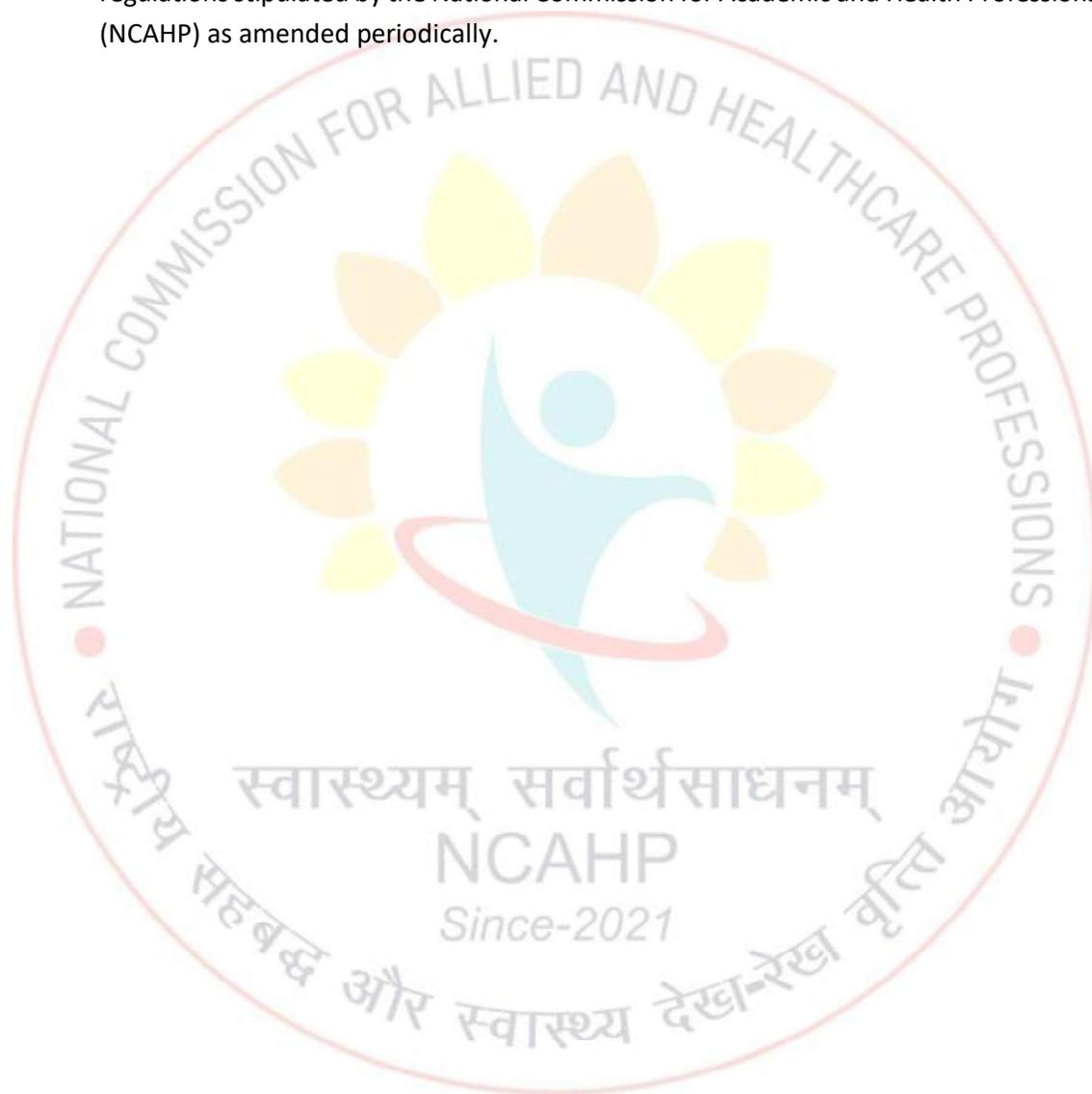
- University teachers after superannuation, if they are re-appointed in the parent University as contract or honorary or distinguished or emeritus professor, may continue as Research Supervisors till the age of 70. The university/college, after considering the research track record and fitness of such superannuated teachers to supervise scholars, may decide on his/her continuation as Research Supervisor with or without financial commitment. Minimum number of the credit requirement for the Ph.D. programme should be at least 12 credits and a maximum of 16 credits.
- The coursework shall be treated as a prerequisite for Ph.D. preparation. A minimum of four credits shall be assigned to one or more courses on Research Methodology which could cover areas such as quantitative methods, qualitative methods, computer applications, research ethics, and review of published research in the relevant field, fieldwork, etc.
- Students who register for Ph.D. directly from four-year undergraduate with research will have to undertake 6-8 credit courses (at Ph.D. level) about relevant skills/research techniques/domain-specific subjects offered by the University.
- All Ph.D., entrants irrespective of discipline, shall be required to take credit-based courses in teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period. Other courses shall be advanced-level courses preparing the students for the Ph.D. degree. Lifelong learners/ accomplished researchers as evinced from their original contributions in terms of patents granted or new relevant knowledge or/and artistic practices desirous to get a research degree the Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated. Credits earned for completed course work are transferable from one institution to another institution through the Academic Bank of Credits. All fresh Ph.D. entrants, irrespective of discipline, will be required to take credit-based courses in teaching/education/pedagogy/writing related to their chosen Ph.D subject during their doctoral training period. Ph.D. scholars may also have 3-4 hours per week of actual teaching experience gathered through teaching assistantships or other forms of knowledge dissemination that are not repetitive. All dissemination activities including External presentations and posters, popular articles conveying scientific information (or scientific articles) to the general public, production of books, commissioned research and Internal presentations must be approved by the departmental level Research Committee. Teaching for the Department, supervision of fellow students/technical staff, dissemination tasks can also be credited as knowledge dissemination and as a work commitment.
- The Department where the scholar pursues his/her research shall prescribe the course(s) to him/her based on the recommendations of the Research Advisory Committee (RAC) of the research scholar.

- All candidates admitted to the Ph.D. programmes shall be required to complete the course work prescribed by the Department during the initial one or two semesters. Grades in the course work, including research methodology courses shall be finalized after a combined assessment by the Research Advisory Committee and the Department and the final grades shall be communicated to the Institution/College.
- Post Graduate Departments of Universities/Colleges may be considered eligible to offer Ph.D. programmes only if they satisfy the availability of eligible Research Supervisors, required infrastructure, and supporting administrative and research promotion facilities as per these Regulations.
- Post Graduate Departments of such Colleges, Research laboratories of Government of India/State Government with at least two Ph.D. qualified teachers/scientists/other academic staff in the Department concerned along with required infrastructure, supporting administrative and research promotion facilities as per these Regulations, stipulated below, shall be considered eligible to offer Ph.D. programmes. Post Graduate Colleges should additionally have the necessary recognition by the Institution under which they operate to offer Ph.D. programme.

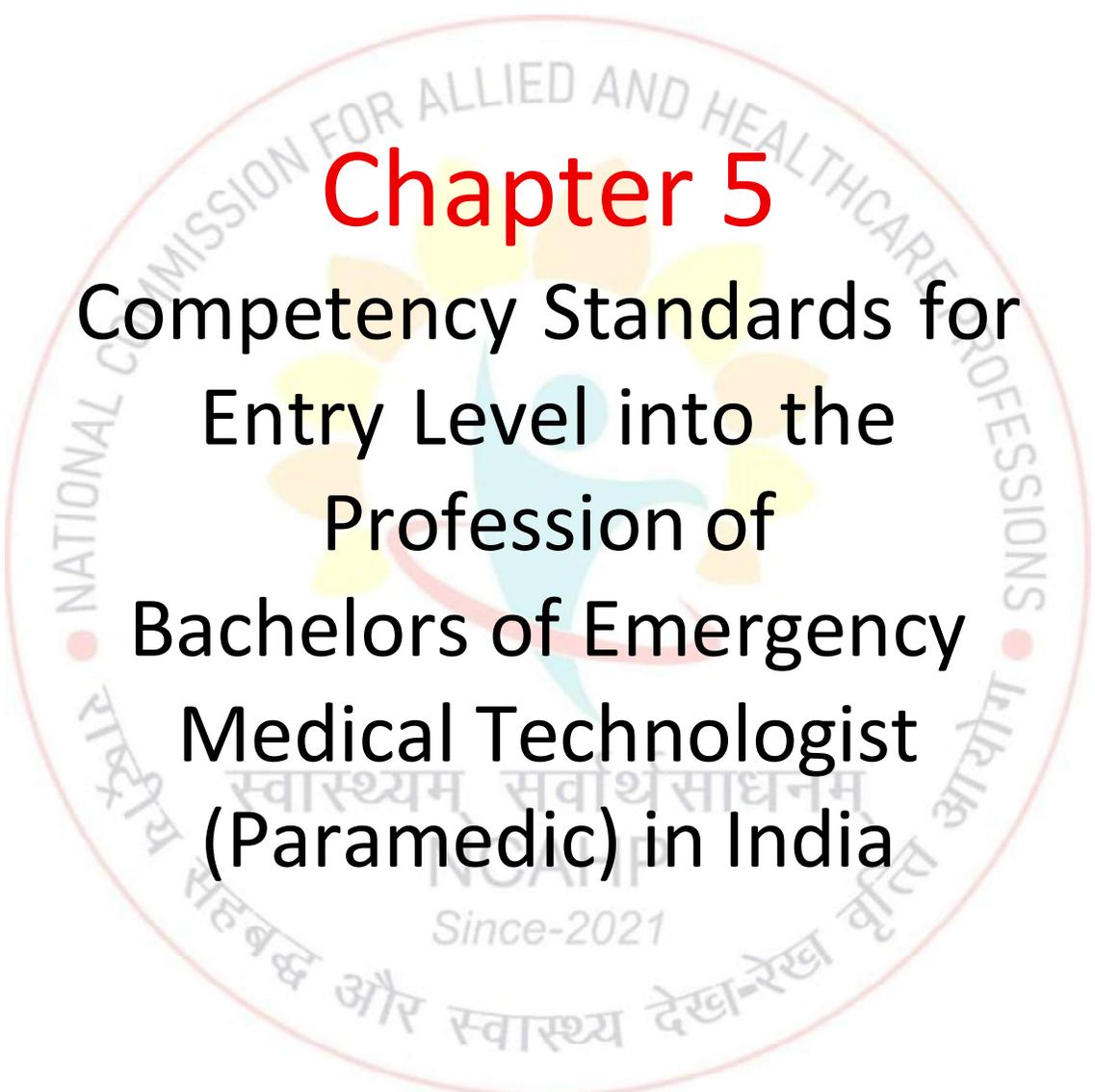
**Colleges with adequate facilities for research as mentioned below alone shall offer Ph.D. programmes:**

- Exclusive research laboratories with sophisticated equipment as specified by the Institution concerned with provision for adequate space per research scholar along with computer facilities and essential software, and uninterrupted power and water supply;
- Earmarked library resources including latest books, Indian and International journals, e-journals, extended working hours for all disciplines, adequate space for research scholars in the Department/ library for reading, writing and storing the study and research materials;
- Colleges may also access the required facilities of the neighboring Institutions/Colleges, or those Institutions/Colleges/R&D laboratories/Organizations which have the required facilities.
- All requirements for the Ph.D. degree of such candidates must be duly fulfilled. It is the joint responsibility of the affiliated Colleges, University departments/ Universities.
- Not with standing anything contained in these Regulations or any other Rule or Regulation, for the time being in force, no University/College shall conduct Ph.D. programmes through distance education mode/online mode.
- Candidates in service shall be allowed to do Ph.D., provided all the eligibility conditions mentioned in the extant Ph.D. Regulations are met.
- Following the successful completion of the evaluation process and before the announcement of the award of the Ph.D. degree(s), the Institution concerned shall submit an electronic copy of the Ph.D. thesis to the INFLIBNET/Institutional Electronic Archive, for hosting the same so as to make it accessible to all Institutions.

- The guidelines pertaining to matters such as full-time and part-time enrolment, roles and responsibilities within departmental research committees, admissions procedures, supervision arrangements including co-supervisors, regulations concerning leave and vacation entitlements, funding protocols, fee structures, registration processes, duration of study, coursework requirements, qualifying examination procedures, criteria for publication, guidelines for the submission of final theses, and appointment of external examiners, etc., are subject to alignment or modification in accordance with the regulations stipulated by the National Commission for Academic and Health Professions (NCAHP) as amended periodically.







# Chapter 5

## Competency Standards for Entry Level into the Profession of Bachelors of Emergency Medical Technologist (Paramedic) in India

## Competency Standards for Entry-Level EMS Professionals in India

These standards have been developed for the EMS Professionals

### What is a competency?

‘Competency is the Ability to perform the activities within an occupation or function to the standard expected in employment’.

OR

Competency has been defined as the Ability to perform the responsibilities required of professionals to the standards necessary for safe and effective practice.

A competency will be a combination of the specification and application of a knowledge or skill within the occupation, to the appropriate standard. It will include the requirement to perform individual tasks; to manage a number of different tasks, to respond to irregularities and breakdowns in routine and to deal with the responsibilities and expectations of the work environment. Thus, it will be a combination of task skills, task management skills, contingency management skills and job/role environment skills.

Competency-based standards are seen to encompass all forms of achievement of competence rather than only formal indicators such as formal qualifications from educational institutions and could have a role in the process of articulation or linkage between professions and related trades or occupations.

### What is the goal of developing Entry Level EMS Professionals Competency Skill document

To establish a standardized framework of essential skills, knowledge, and professional behaviors reducing variability in training quality and ensuring uniform preparedness of graduates. Clearly outline the minimum clinical, operational, communication, and ethical skills expected of an entry-level EMS professional to ensure safe and effective patient care.

### Terminology:

Some terms used in this document have specific meanings within the context of competency standards

### Unit:

A major segment of the overall competency of the profession, typically representing a major function or role of the profession.

**Performance criteria:** Evaluative statements which specify the required level of performance.

### Indicators:

Measurable and observable features, which can assist in determining whether a competency is achieved.

## Classification Units of Competency Skills at Entry level for EMS Professionals

Unit of Competency	Specific Competencies
<b>Emergency Response &amp; Scene Management</b>	<ul style="list-style-type: none"> <li>• Pre-Arrival Instructions Scene safety,</li> <li>• Hazard identification, personal protection,</li> <li>• Incident command awareness,</li> <li>• Extrication, disaster triage</li> </ul>
<b>Patient Assessment</b>	<ul style="list-style-type: none"> <li>• Primary survey (ABCDE), Secondary survey,</li> <li>• Vital signs (BP, HR, RR, SpO<sub>2</sub>, GCS),</li> <li>• Early recognition of emergencies</li> </ul>
<b>Immediate Interventions</b>	<ul style="list-style-type: none"> <li>• BLS &amp; CPR,</li> <li>• AED/defibrillation, oxygen,</li> <li>• Airway adjunct use, Active bleeding control, splinting,</li> <li>• Wound care,</li> <li>• Spinal motion restriction devices.</li> </ul>
<b>Ambulance Operations &amp; Technical Skills</b>	<ul style="list-style-type: none"> <li>• Ambulance checks,</li> <li>• Safe driving (as per licensing), lifting &amp; moving patients, stretcher handling, equipment readiness</li> </ul>
<b>Infection Prevention &amp; Safety</b>	<ul style="list-style-type: none"> <li>• PPE use, hand hygiene, aseptic techniq biomedical waste disposal, ambula</li> <li>• Decontamination</li> </ul>
<b>Communication, Documentation and Professional Practice</b>	<ul style="list-style-type: none"> <li>• Patient communication, empathy, cultu sensitivity, documentation (PCRs), structure</li> <li>• Handover (SBAR/ATMIST), teamwork</li> </ul>
<b>Ethical &amp; Legal Competencies</b>	<ul style="list-style-type: none"> <li>• Confidentiality, consent, medico-le documentation, understanding scope of practice</li> <li>• Ethics in emergency care</li> </ul>
<b>Soft Skills</b>	<ul style="list-style-type: none"> <li>• Teamwork, leadership in emergencies, str management, conflict resolution, dealing with gr and family support</li> </ul>
<b>Public Health &amp; Community Preparedness</b>	<ul style="list-style-type: none"> <li>• Health education, community CPR traini disaster preparedness, awareness of CB</li> <li>• Hazards, community response participation</li> </ul>
<b>Lifelong Learning &amp; Professional Development</b>	<ul style="list-style-type: none"> <li>• Reflective practice, participation CME/simulation, self-assessment, adherence new protocols and guidelines</li> </ul>

<b>Performance Criteria (Unit of Competency)</b>	<b>Knowledge</b>	<b>Skill</b>	<b>Behavior</b>
<b>1. Emergency Response &amp; Scene Management</b>	Principles of scene safety, ICS, disaster triage protocols	Conducts scene size-up, applies PPE, performs safe extrication, participates in mock drills	Demonstrates situational awareness, ensures own/patient/bystander safety, collaborates with other responders
<b>2. Patient Assessment</b>	Steps of primary & secondary survey, vital signs ranges, recognition of emergencies	Accurately measures BP, HR, RR, SpO <sub>2</sub> , GCS; conducts systematic patient assessment	Remains calm, systematic, and reassuring while assessing patient
<b>3. Clinical Care</b>	Indications for CPR, oxygen therapy, splinting, wound care, shock recognition	Performs CPR/AED, airway adjunct use, hemorrhage control, splinting, spinal precautions	Shows urgency, empathy, and adherence to protocol under pressure
<b>4. Ambulance Operations &amp; Technical Skills</b>	Ambulance readiness protocols, safe lifting principles, equipment checklists	Conducts daily ambulance checks, uses stretchers & immobilization devices safely, operates monitoring equipment	Follows safety standards, maintains accountability for equipment
<b>5. Infection Prevention &amp; Safety</b>	Principles of hand hygiene, PPE, waste management, aseptic practice	Performs hand hygiene, dons/doffs PPE, segregates biomedical waste, disinfects ambulance	Consistently applies safety practices, promotes infection control culture
<b>6. Communication &amp; Professional Practice</b>	Principles of therapeutic communication, handover formats (SBAR/ATMIST), documentation standards	Provides structured handovers, completes accurate PCRs, communicates effectively with patients/families	Demonstrates empathy, respect, cultural sensitivity, and professionalism

<b>Performance Criteria (Unit of Competency)</b>	<b>Knowledge</b>	<b>Skill</b>	<b>Behavior</b>
<b>7. Ethical &amp; Legal Competencies</b>	Scope of practice, confidentiality, informed consent, medico-legal documentation	Obtains consent appropriately, secures medico-legal reports, maintains confidentiality	Acts with integrity, accountability, and respect for patient rights
<b>8. Psychosocial &amp; Soft Skills</b>	Stress response, teamwork principles, conflict resolution strategies	Works effectively in teams, applies de-escalation techniques, uses coping strategies	Demonstrates resilience, emotional stability, and collaborative attitude
<b>9. Public Health &amp; Community Preparedness</b>	Basics of community health, disaster preparedness, CBRN awareness	Conducts CPR awareness sessions, participates in drills, demonstrates safe CBRN precautions	Shows responsibility towards community, encourages preventive health
<b>10. Lifelong Learning &amp; Professional Development</b>	Principles of reflective practice, CPD requirements, evidence-based updates	Engages in CME, uses simulation, applies updated EMS protocols	Demonstrates willingness to learn, adaptability, and accountability for self-improvement

**Pedagogy:**

The course will aim to develop competencies to BEMTome effective teacher/ instructor in Emergency Care program by imparting knowledge and skills of health professions education. The main objective is to develop the teaching and assessment capabilities of the candidates. Candidates are expected to possess and exhibit cognitive abilities, which include comprehension, analysis, evaluation, understanding the structure of arguments, deductive and inductive reasoning. The candidates are also expected to have a general awareness about teaching and learning processes in higher education system, with focus on medical and health professional education.

## **The Circle of Learning:**

The Circle of Learning is about maintaining competence over time and, most importantly, continuous improvement.

### **1. Knowledge Acquisition**

- Healthcare professionals must be able to recognize conditions in need of emergency treatment.
- This ability requires comprehensive knowledge.
- Individual learners can acquire the necessary knowledge by accessing suitable sources such as recommended books, journals and Internet sites.
- A facilitator could be an “on demand” learning source.
- Knowledge acquisition is stimulated by engaging learning processes and self-assessment.
- Results can be documented in self-administered knowledge checks, or in a test offered by the teacher.

### **2. Skills Proficiency**

- To master defined skills is essential for emergency medical personnel in order to provide adequate treatment, whether working alone or in teams.
- Personal skills can be acquired by individuals in self-directed hands-on practice.
- Enhancement of skills may require supervision.
- Team skills, such as efficient communication, should be learnt by teams.
- After initial learning, considerable practice is needed to master and maintain the skills sufficiently well.

### **3. Decision Making**

- Decision making offers unique interactivity with a visualized learning program that simulates real patient cases.
- Such programs are particularly suitable for decision making and procedural training.
- Use is preferably allowed at any time and from anywhere.

### **4. Simulation in teams**

- Every day healthcare professionals have to interact and work together as teams in order to save patients’ lives.
- Group practice of realistic scenarios help to improve teamwork, leadership and communication skills, and reduce human error.
- Using simulation, a wide variety of clinical conditions can be simulated in controlled environments to produce standardized experiences.
- The patient actor or simulator and the training scenarios must be realistic. The environment should closely resemble the learner’s workplace
- The relevance of the training must be underpinned by clear and unambiguous learning objectives
- Suitable debriefing provides objective assessment of individual and team training
- Debriefing has been proven to enhance learning results decisively

## 5. Clinical experience

- Learning by apprenticeship is a well acknowledged educational method in healthcare; juniors watch seniors, then perform under supervision and guidance before eventually being left to perform on their own.
- Learning by apprenticeship will always remain important.
- However, available learning resources are usually scarce, and not everyone will get enough practice before being expected to demonstrate proficiency.
- This is a sound basis for applying the Circle of Learning approach to master medical emergencies.

**The Circle of Learning should be regarded as an extension into a spiral that allows individuals to revisit core skills on a regular basis.**

- The Circle of Learning offers a structured approach to continued learning resulting in a higher level of proficiency.
- This helps trained healthcare professionals to BEM Tome experts in their fields.
- Such an approach can also be appreciated as a measure to bridge the gap between education and practice.

## Simulation based education

- Simulation-based education is an educational tool with a clear methodology, allowing teaching, learning, and assessment in a safe learning environment.
- Simulating healthcare practice in such an environment can and does allow errors to occur at no risk to patients, with valuable learning opportunities presenting as a result.
- The recognition of and focus on patient safety have increased the utilization of simulation- based training.
- In many areas, the simulation modality replaces the traditional apprenticeship model in health care education solving ethical issues and improving patient safety.
- Aiming for the reduction in the time that students spent in clinical areas and the requirement to provide equity of training for newly qualified graduates necessitated the adoption of simulation within pre-service/in-service curricula.
- Simulation provides an alternative means of promoting skill development at set stages. Programs of technical skills (cannulation, airway management, and catheterization) and non-technical skills development (task management, team working, communication, situation awareness, and decision making) allow learners to demonstrate competency throughout the continuum of learning.
- In the process of reflection, the learner must utilize his or her knowledge and apply it in the analysis of the experience and the outcome, identify gaps and areas for improvement and make an action plan.

**Required tools: Classroom/ clinical setup for teaching, course curriculum for experimentation**

Performance criteria	Indicators		
	Knowledge	Skill	Behavior
Ability to frame learning objectives of a course in alignment with program objectives.	<ul style="list-style-type: none"> <li>• Has basic knowledge of learning taxonomy, SMART objectives</li> <li>• Knowledge of steps to frame the learning objectives.</li> <li>• Knowledge of various types of curricula</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the ability to frame learning objectives for the course/program</li> <li>• Aligns the course objectives with the program objectives</li> </ul>	<p>Awareness about roles and responsibilities Paramedic practice</p>
Ability to design learning and assessment modules for the given course.	<ul style="list-style-type: none"> <li>• Knowledge of principles of adult learning</li> <li>• Knowledge of various components of instructional design, models, and strategies,</li> <li>• Knowledge of Various teaching-learning and assessment methods</li> <li>• Familiarity with cognitive and developmental psychology</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiency in learner analysis</li> <li>• Designs an instructional module for given learning objective.</li> <li>• Finds resources and develops study material for a given module.</li> <li>• Defines measurable learning outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Learner centric approach</li> <li>• Communication and teamwork</li> <li>• Organisational skills</li> <li>• Analytical thinking</li> </ul>

Performance criteria	Indicators		
	Knowledge	Skill	Behavior
Ability to impart the instructional module to achieve learning objectives	<ul style="list-style-type: none"> <li>• (pre-requisite) In depth knowledge of the subject assigned to teach</li> <li>• Understanding of different types of learners and learning environment and factors that contribute to learning.</li> <li>• Knowledge of Various teaching-learning methods</li> <li>• Use of technology in delivery of modules</li> <li>• Knowledge of bedside/ clinical teaching methods</li> <li>• Knowledge of evidence-based teaching.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate strong communication skills.</li> <li>• Implements various teaching assignments using appropriate technological solutions.</li> <li>• Ability to conduct demonstration of various lab experiments / clinical tests.</li> <li>• Demonstrates ability of evidence-based teaching</li> </ul>	<ul style="list-style-type: none"> <li>• Critical thinking and problem-solving ability.</li> <li>• Collaborative working in team</li> <li>• Care and inclusiveness</li> <li>• Flexibility and adaptability in different learning environments</li> <li>• Cultural sensitivity</li> <li>• Role model behaviour</li> </ul>

Performance criteria	Indicators		
	Knowledge	Skill	Behavior
Ability to choose the form and conduct assessment for the given course.	<ul style="list-style-type: none"> <li>• Knowledge of summative and formative assessments</li> <li>• Knowledge of various assessment tools</li> <li>• Understanding of performance criteria</li> <li>• Knowledge of assessment reports and feedback</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical skills to judge the performance against given criteria.</li> <li>• Ability to communicate with the students during and after the assessment.</li> <li>• Demonstrates reporting of assessment.</li> <li>• Gives constructive feedback to students</li> <li>• explaining outcomes of assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Unbiased / neutral behaviour</li> <li>• Analytical skills</li> <li>• Flexible approach of communication, appropriate for pre assessment, during assessment and post assessment sessions</li> </ul>
Ability to reflect on the academic processes by analysing learner's feedback and program outcomes	<ul style="list-style-type: none"> <li>• Knowledge of different models of program evaluation</li> <li>• Knowledge of different models of feedback</li> <li>• Knows basis statistics to draw results from data.</li> <li>• Understanding of various delivery channels/ tools to give feedback / reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Designs a student's feedback questionnaire.</li> <li>• Performs statistical Analysis of data collected.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructive and collaborative approach</li> <li>• Curiosity</li> <li>• Life-long learning skills</li> </ul>

## Minimum Standard Requirement (MSR)

### Bachelors in Emergency Medical Technologist (Paramedic) program

All existing colleges / institute or A new college will impart Bachelors in Emergency Medical Technologist (Paramedic) education is suggested the following conditions are fulfilled:

#### 1. Infrastructural, Functional & Equipment and human resource Requirements

**The establishment of an Bachelors in Emergency Care (Paramedic) college** – No person shall establish a college/institute except after obtaining prior permission from the National commission (NCAHP). education prepares a person for **equip individuals with the knowledge, skills, and professional attributes** necessary to function effectively as first-line emergency care providers in pre-hospital and emergency departments.

The following organizations shall be eligible to apply for permission to set up a college, Bachelors in Emergency Medical Technologist (Paramedic) college namely:

- A State Government/Union territory;
- A University and Deemed to be University,
- An autonomous body promoted by Central and State Government by or under a Statute for the purpose of medical education;
- A society registered under the Societies Registration Act, 1860 (21 of 1860) or corresponding Acts in States; or
- A public religious or charitable trust registered under the Trust Act, 1882 (2 of 1882) or the WAKFS Act, 1954 (29 of 1954).
- Companies registered under Company Act may also be allowed to open Paramedic colleges.

#### 2. Land and Building

- If the college is in the premises of NMC permitted / recognized medical college, no separate land is required. Existing norms of land for medical college will suffice. Besides that, the constructed area /Building norms for Bachelors in Emergency Medical Technologist (Paramedic) College must be fulfilled as per the requirement mentioned below. In all other cases, the applicant must provide the land details on which the institution will be established for providing paramedic education. It should be in the name of society/ Trust/company applying for the same (sale deed/lease/gift deed etc.).
- That the applicant Institution / Trust should have an independent building for Bachelors in Emergency Medical Technologist (Paramedic) College and facilities for clinical training as per the curriculum as prescribed by the commission from time to time.
- Such a building should be constructed in such a way that there is adequate parking space and recreational area or open space for students as prescribed by the commission.

- Such a building should have adequate space and should have out-patient with emergency department, various laboratories as needed, office space, class rooms, hostel and other ancillary facilities. Teaching Hospital Facility and Emergency Department and the college can be placed in different buildings within 50 KM (or as per the NCAHP regulations) distance in the same state of India
- Minimum exclusive built up area for such a college should be 26675 sq.ft for an intake of minimum of 50 students per batch and 35750sq.ft for the maximum intake of 100 students per batch.
- Building should be barrier free accessible to persons with disability and as per NBCI guidelines (National Building Code of India).
- Building must be recorded on the appellate institute name or if the land is under lease agreement, it must be for at least 10 years
- Building must have requisite clearances from the respective civic and administrative authorities' like - Fire NOC, structural stability certificate, land use certificates etc.
- Building must have CCTV camera for CCTV surveillance for every area of common use as can be prescribed.
- Biometric facility for students and staff, faculty attendance record/documentation

### 3. Emergency Departments with Emergency Medical services

A well-equipped OPD facility with in patient facility with all specialties like medical, trauma, surgical, Intensive Care Units, Obstetrics & Gynecology (Maternity, Labor room) pediatrics & neonatology, cardiology, neurology etc should be available at the college premises. A student/ patient ratio of 1:5 should be maintained. That means a hospital with 100 OPD can have a maximum intake of 50-100 students per year. In addition to the own hospital in the college building (in case of the existing institutions) if required, the College can get attachment (through signed MOUs) with various hospitals with minimum 100 patients workload per day.

### 4. Hospital / Hospital Attachment –

- If the college is in the premises of MCI/NMC permitted/recognized Medical College as constituent college, then, there is no requirement for attachment of any other hospital.
- In all other cases Proof of availability of own/attached hospital (Government/Private) for clinical training of 50 students shall be furnished (student: Patient ratio of 1:5). The hospital must be within 20 km in urban area and 30 km radius of rural area College. College must provide mandatory bus service to the students if the hospital is located more than 1 km away from the College. Within 5 years of application of these Rules, the colleges must have Own Prescribed Hospital in the college premises

**Maximum Distance (Km) Allowed from Hospital/OPD/Practicing Area to College/Institute/University**

Profession	Name of Program	Urban	Rural	Remarks
Bachelor of Emergency Medical Technologist (Paramedic)	Bachelor's Degree	20 Kms	30 Kms	
Masters of Advanced Care Paramedic	Master's Degree	20 Kms	30 Kms	

- College can be affiliated to maximum five (05) hospitals having indoor and outdoor facility in the above mentioned specialty clinics.
- Tie up hospitals cannot get attached to more than two colleges. If the affiliated hospital is attached with two colleges, the patient strength must be adequately divided amongst the colleges as per the prescribed student: patient ratio.
- The affiliated hospital shall provide information regarding any MOU with other colleges, if any & MOU should be for at least five years.
- The MOU should mention the available clinical specialties, patient loads, and availability of required equipment for clinical training with names and designations of the faculties responsible for the training in the hospital.
- FACULTY: The college/institute must arrange for Bachelor of Emergency Medical Technologist (Paramedic) faculty members for supervision and clinical teaching of students inside the hospital. This can be done either by posting its own faculty members in the hospital or making remunerative arrangement for recruiting faculty members of the hospital.



**5) Space allotment for an annual intake of 50 students of Bachelors and 15 students of post-graduation students**

**Area (Sq. Ft.) X Number of Units**

S.no	Details	Bachelors Degree	Master Degree
1	Department Office	500X1	
2	Dean/Director/Principal	300X1	200X1
3	Professor Office	200X2	
4	Associate Professor Office	100X4	100X1
5	Assistant Professor	50X4	50X2
6	Common Staff	500X1	300X1
7	Visiting Faculty Room	300X1	
8	Seminar	1000X1	
9	Conference	1500X1	
10	Classrooms	1200X4	400X2
11	Students Common Room (Girls)	500X1	
12	Students Common Room (Boys)	500X1	
13	Library with Reading Room	2000X1	
14	Discussion Room	300X1	
15	OPD		

**6) Minimum Infrastructure Recommendation for Bachelors of Emergency Medical Technologist (Paramedic) College for the batch of 50 students of Bachelors and 15 students of post-graduation students**

1. Classrooms (4)
  - a. Minimum number of classrooms -4
  - b. Size of each classroom: 1200 x 4
2. Library: (1)
  - a. 2000 x 1
3. Common Room for girls- (1)
4. Common Room for boys- (1)
5. Auditorium (optional)- (1)
6. Principal and Administration office: 300 x 1 and 500 x 1
7. Faculty room: One room of 500 x 1 sq. ft.
8. Computers: Twenty Desktop computers with necessary software applications

**Desirable Batch size for Bachelors of Emergency Medical technologist (Paramedic)**

It should be proportional patient flow to the at hospital. Each student should be able to examine minimum of 5 patients per day. For example: For an OPD of 150.

Institutions can have an intake of minimum 50 students per batch and maximum of 100 students per year. A clinic/hospital having an OPD of 500 can have the intake of 100 students per batch. If the intake is more than 50, infrastructure should also be increased proportionally. Student and faculty ratio is 10:1. The maximum batch size should be proportional to infrastructure, number of faculties and OPD.

**Desirable Batch size for Masters of Advanced Paramedic:**

Maximum of 10-15 students shall be the batch size of a post graduate program.

Teachers at the level of Assistant Professor II or Scientist D and above shall guide the students The teacher student ratio for dissertation guidance shall be 1:4.

**Guidelines for standalone institutes**

A clear legal vetted (Notarised stamp paper) Memorandum of understanding (MoU) needs to be provided for any institute/hospital for sharing the infrastructure and it should follow the NCAHP guidelines.

**Faculty requirement for UG**

- Full time (FT); Part time (PT)
- It is recommended that a core faculty and student ratio for UG 1:10 to be followed.
- Faculty ratio shall be approximately 1:2:5 for Professor: Associate Professor: Assistant Professor.
- Ideally all the faculties should be full time. In case of non-availability of full time faculty, 40% may be part time/visiting/Ad hoc faculties (non-core subjects only)
- Faculties appointed for academics for teaching purposes are considered as Full time (Maximum of 8 hours per day or Minimum 40 hours per week).

- If the college/hospital wants faculties to take care of OPD for 3 days in a week, then faculty requirement shall be doubled.
- Visiting faculties can also be considered as part time

#### Faculty requirement for PG:

- Principal/Vice principal/HOD is same for both UG and PG programs.
- It is recommended that a core faculty and student ratio of 1:5 for PG to be followed.
- Student faculty ratio needs to be 5:1 at least Associate professor Level for PG teaching.
- In case of non-availability of full time faculty, 30% may be part time/visiting/Ad hoc faculties.
- Separate facilities need to be provided for PG students/Fellowship programs/PhD programs.

Name of Program	Annual Intake Capacity	Professor	Associate Professor	Assistant Professor	Tutor/Demonstrator
Bachelors of Emergency Care (Paramedic)	50	2	4	6	4
Masters of Emergency Care (Advance Care Paramedic)	15 - 20	1	1	2	-

#### Library Details:

Item	Requirement
Text Books As per syllabus; one copy of Book per 10 students.	Approximately 500 books for 50 intake
Reference books	100 Advanced Books As per requirement
Journals	At least 2 international and 2 national journals
Subscription to electronic data base / e- journals	Required
Mandatory Internet facility Access to e-library Equipment	Minimum 15 computer terminals for 60 students/8 for 30 students.

### List of Practical Laboratories /Simulation Lab

S.I No	Profession	Name of Program	List of Departments	Area (Sq. Ft.) X No. of units	Remarks
1	Trauma and Burn Care	Bachelors of Emergency medical technologist (Paramedic)	Simulation lab with AV recording and Debriefing Room	Minimum of 3000 Sq ft or 400 x 6	
2		Masters of Advanced Care Paramedic	Task Training skills lab		
3			Obstetrics and gynaecology lab		
4			Trauma simulation lab		
5			Pediatric and Neonatal lab		
6			Pharmacology lab		
7			Ambulance Simulator or Mock Ambulance Bay	500 x 2	

## Equipment's

S.NO	TASK TRAINERS / Mannequins/ Essential Equipment's for skill Lab
1	Adult CPR mannequins with feedback device
2	Infant CPR mannequins with feedback device
3	Child CPR Mannequins
4	Defibrillaion Mannequins
5	ECG Rhythm simulators
6	Intra Venous arm Training Adult
7	Intra Venous arm Training Pediatric
8	Arterial access Training
9	Adult Airway Management Trainer
10	Airway training Infant
11	Airway training Child
12	New Born Intubation Trainer
13	Pneumothorax and chest tube training
14	NG tube and tracheostomy care
15	Trauma Simulator
16	BTLS wound module
17	Pediatric Trauma mannequin
18	Birthing Simulator -task trainer
19	PPH simulator
20	Basic suturing model
21	LP and Epidural Trainer
22	IV Torso
23	IO Mannequins pediatric
24	IO Mannequins Adult
25	CVA mannequins
26	Suturing mannequins
27	Full body Manikins
28	Crash Cart
29	Required Disposable and Non Disbosable equipments
30	Triage Tags and MCI Kits

## Text Books

- Mosby's Paramedic Textbook Author: Mick J. Sanders
- Detailed reference for EMS providers with operational and clinical topics  
Fundamentals of Emergency Care Author: Richard Beebe
- Provides foundation in EMS skills, ambulance procedures, and scene management
- Paramedic: Anatomy and Physiology (for understanding transport physiology)  
Author: American Academy of Orthopedic Surgeons (AAOS)\
- Nancy Caroline Emergency Care in the streets - 8th edition
- Mosby's EMT basic textbook 2nd edition
- The Emergency Medical Responder Training And Succeeding As An Emt/Emr - 2021  
Edition by Christian Ventura
- Handbook of Hospital Administration 2018 Edition by Madhav, Elsevier
- Hospital Orientation handbook for Nurses and Allied health professionals, Haggard,  
Ann
- Ross And Wilson Anatomy And Physiology In Health And Illness - 13th edition
- Essentials of Medical Physiology, 8th edition - K. Sembulingam
- Basics in Human Anatomy for BSc Paramedical Courses
- Memmler's structure and function of the Human Body - 14th edition
- Essentials Of Medical Pharmacology 8th Edition 2018 - KD Tripathi
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition
- An Introduction to Clinical Emergency Medicine 2nd Edition - Dr. S.V. Mahadevan ,  
Gus.M. Garmel
- Pharmacology for Prehospital professional, Geffery S Ghai - 2nd edition
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition
- International Trauma Life Support (ITLS) for Emergency care providers - provider  
manual
- Fundamentals of Nursing - Patricia potter - 9th edition
- Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice - 2017  
edition
- Rosen's Emergency Medicine: Concepts and Clinical Practice, vol.1 and 2
- Textbook of Community Medicine, 4th edition – Bhalwar
- Textbook Of Community Medicine Preventive And Social Medicine 5Th Edition by  
Sunder Lal and Adarsh and Pankaj
- American college of Emergency Physicians - First Aid manual - 5th edition
- American Heart Association - First Responder provider Manual 2020 guidelines
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition
- Fundamentals of Nursing - Patricia potter - 9th edition
- Mosby's EMT basic textbook 2nd edition
- Ciotonnes Disaster medicine- Dr. Gregory ciotonne - 2nd edition
- Disaster management P. Kumar
- Basic Disaster life support - BDLS provider manual

- International Trauma Life Support (ITLS) for Emergency care providers - provider manual
- Pre hospital Trauma Life Support (PHTLS) NAEMT provider manual -8th edition
- Nancy Caroline Emergency Care in the streets - 8th edition
- Mosby's EMT basic textbook 2nd edition
- Tintinalli's textbook of Emergency Medicine- Judith E. Tintinalli 9th edition
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition
- American Heart Association - Basic Life Support provider Manual 2020 guidelines
- American Heart Association - Advanced Cardiac Life Support provider Manual 2020 guidelines
- Tim Phalen and Barbara Aehlert The 12 Lead ECG in ACS 4th edition
- Basic arrhythmias - Gail walraven 8th edition
- Barbara J Aehlert - Paramedic Practice Today
- Mosby's paramedic textbook 2nd edition
- Tintinalli's textbook of Emergency Medicine- Judith E. Tintinalli 9th edition
- Rosen's Emergency Medicine: Concepts and Clinical Practice, vol.1 and 2
- DC Dutta Textbook of Obstetrics - 9th edition
- Textbook of Obstetrics - Dr. B. Usha Kumari
- Pharmacology for medical graduates - 4t edition , Smita Shinoy and Tara shanbag
- American Heart Association - Advanced Cardiac Life Support supplementary Manual
- Tim Phalen and Barbara Aehlert The 12 Lead ECG in ACS 4th edition
- Basic arrhythmias - Gail walraven 8th edition
- IAP textbook of Pediatrics - 8th edition A. Parthasarathy
- Roberts and Hedges' Clinical Procedures in Emergency Medicine - 7th edition
- Nancy Caroline Emergency Care in the streets - 8th edition
- Manipal Manual of Surgery - KR Shenoy 5th edition
- Egan's fundamentals of Respiratory Care - 12 th edition
- SRB Manual of surgery -7th edition Bhatt M. Sriram

## References:

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## List of Abbreviations

Abbreviation	Full Form
NCAHP	National Commission for Allied and Healthcare Professions
EMS	Emergency Medical Services
CPR	Cardiopulmonary Resuscitation
AED	Automated External Defibrillator
BLS	Basic Life Support
ACLS	Advanced Cardiac Life Support
GCS	Glasgow Coma Scale
AVPU	Alert, Verbal, Pain, Unresponsive
SBAR	Situation, Background, Assessment, Recommendation
FAST	Focused Assessment with Sonography in Trauma
POCUS	Point-of-Care Ultrasound
ICU	Intensive Care Unit
NICU	Neonatal Intensive Care Unit
CSSD	Central Sterile Services Department
MTP	Massive Transfusion Protocol
DIC	Disseminated Intravascular Coagulation
TTP	Thrombotic Thrombocytopenic Purpura
ABG	Arterial Blood Gas
AI	Artificial Intelligence
CRRT	Continuous Renal Replacement Therapy
ECMO	Extracorporeal Membrane Oxygenation
IABP	Intra-Aortic Balloon Pump
VAD	Ventricular Assist Device
SOAP	Subjective, Objective, Assessment, Plan
SBAR/ATMIST	Structured handover formats (ATMIST: Age, Time, Mechanism, Injuries, Signs, Treatment)
PCR	Patient Care Report
NEET	National Eligibility cum Entrance Test
CAS	Career Advancement Scheme

## Annexure : Log Book

### BEMT INTERNSHIP LOGBOOK PROFORMA

**Institute Name & Logo**

**Logbook for BEMT Internship Program**

**Student Name** .....

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

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

#### **Introduction:**

This logbook is designed for trainees enrolled in the Advanced Care Paramedic program. It serves both as a structured guide to the training curriculum and as a portfolio to document clinical experience, competencies, and evaluations. All trainees are required to maintain this logbook. The records within will serve as official evidence of acquired competencies essential for professional development and successful completion of the program.

#### **Goals and Objectives:**

The primary aim of the Advanced care Paramedic Training Program is to develop highly skilled, independent, and competent professionals who can deliver high-quality emergency care in pre-hospital and emergency department settings.

The fellowship program aims to equip the paramedic with:

- Comprehensive knowledge in **triage and prioritization of patients** in various emergency scenarios.
- Ability to **recognize and manage life-threatening conditions**, including trauma, cardiac arrest, stroke, and shock.
- Proficiency in assessing and managing **non-life-threatening emergencies** and determining the need for referral or hospital transport.
- **Advanced resuscitation skills** for critically ill or injured patients, including adult and pediatric populations.
- Competence in performing **advanced emergency and life-saving procedures**, such as airway management, IV/IO access, defibrillation, ECG interpretation, and medication administration.
- Active participation in **academic activities**, journal clubs, skill labs, and emergency medicine conferences to stay updated with evidence-based practices.
- Understanding the principles of **emergency response in mass casualty incidents**, humanitarian crises, and disaster medicine.
- Development of **leadership and administrative capabilities** to coordinate EMS teams and manage emergency scenes or units.
- Ability to evaluate clinical responses, **participate in debriefing**, and implement **continuous quality improvement**.

### Learning Objectives:

Upon completion of the advanced care paramedic training, the trainee should be able to:

- Understand the **role of advanced care paramedics** within the healthcare system and their importance in the emergency care chain.
- Demonstrate **independent and collaborative practice** in the field of emergency medicine.
- Apply foundational knowledge of **anatomy, physiology, pharmacology, and pathophysiology** relevant to pre-hospital and emergency care.
- Accurately assess, diagnose (within scope), and initiate management of emergency conditions based on clinical findings and pre-hospital protocols.
- Plan and implement appropriate **preventive and safety measures** during emergency care delivery.
- Exhibit proficiency in **life-saving procedures** and **pre-hospital critical interventions** (e.g., airway management, hemorrhage control, fluid resuscitation).
- Maintain accurate, concise, and **legally appropriate documentation** of all patient encounters, including medico-legal cases.
- Display **compassion, professionalism, and ethical behavior** when interacting with patients and their families.
- Work effectively as part of a **multidisciplinary team**, demonstrating clear communication and collaboration.
- Take leadership roles during **emergency scenes**, ensuring efficient team coordination and safe patient handover.
- Reflect on clinical experiences, accept constructive feedback, and engage in **self-directed learning and performance improvement**.



### Personal Details

Name:	
Gender:	Date of Birth (dd/mm/yyyy) :
Parents Name	
Registration Number:	
Year of Passing +12	
Date of Joining BEMT	
Date of completion of Final Semester	
Address	
Mobile No. of Student	Mobile No. of Parents
Email ID	

I certify that this is a true and recent likeness of the candidate.

AFFIX  
PASSPO  
RT SIZE  
PHOTO

\_\_\_\_\_  
Signature of Dean

## Educational and Academic Activities

Trainees are required to participate in a variety of **certified prerequisite courses** relevant to emergency pre-hospital and advanced paramedic care. These include, but are not limited to:

- **Advanced Cardiovascular Life Support (ACLS)**
- **Pediatric Advanced Life Support (PALS)**
- **International Trauma Life Support (ITLS)**
- Or other equivalent programs recognized by the **Society for Emergency Medicine India (SEMI)** or relevant national/international bodies.

Additionally, active participation in **conferences, workshops, continuing medical education (CME) programs, specialty updates, academic meetings, and journal clubs** must be recorded. These engagements are essential for enhancing knowledge, staying current with evolving best practices, and networking within the emergency medical community.

## Tutorials

Regular tutorials and **scheduled teaching sessions** led by qualified faculty members will cover both **clinical and operational aspects of pre-hospital emergency care**. These tutorials will include:

- Systematic case reviews
- Protocol-based learning
- Simulation training
- Updates on emergency medicine guidelines and innovations

Attendance and key takeaways should be documented as part of the trainee's academic portfolio.

## Case Sheets

This section of the logbook is intended to showcase the **range and complexity of clinical cases** handled or observed by the trainee during the program. Trainees must document:

- Notable clinical encounters
- Pre-hospital assessment and interventions
- Diagnostic impressions
- Referrals or transfers
- Learning points and reflections

Each case sheet should reflect the trainee's **growing competence in managing emergency scenarios**, in line with the core competencies of the Advanced Paramedic curriculum.

---

Name and hospital stamp of  
Certifying Consultant

## Educational and Academic Activities

### Mandatory Courses:

Certification	Location	Valid Date	Expired Date
BLS / Equivalent from AHA			
ACLS/ Equivalent from AHA			
ITLS/ Equivalent from International guidance			
PHTLS/ Equivalent from NREMT			
PALS/ Equivalent from AHA			
BLSO Equivalent from AAFM			
ALSO Equivalent from AAFM			

### Other Courses, Conferences, Specialty Updates, Journal clubs:

Activity	Date	Location

### Tutorial Sheet

Date	Tutorial Topic	Monitor Signature

### Case Sheet

Date	PT ID No.	Clinical Problem	Intervention	Learning points

**Procedures & Skills****IV/IO/EJV**

Date	Pt ID NO	Site	Indication	Difficult Y/N (Reason)	Certifiers Signatures

**Oropharyngeal / Nasopharyngeal Airway Insertion**

Date	Pt ID NO	Indication	OPA / NPA with site of nostril	Difficulty Y/N	Certifiers Signature

**Insertion Of Laryngeal Mask Airway**

Date	Pt ID NO	Indication	No. Attempts	Difficulty Y/N	Certifiers Signature

**Needle Cricothyroidotomy**

Date	Pt ID NO	Contraindication	Complications	Success/Failure (If Failure Reason)	Certifiers Signatures

### Rapid Sequence Intubation

Date	Pt ID NO	Location	Indication	No. Attempts	Success/Failure (If Failure Reason)	Certifiers Signatures

Note-

Cormack –Lehane Classification

Lemon's

C-Collar Application

Date	Pt ID NO	Indication	Success/Failure (If Failure Reason)	Certifiers Signatures

Bag Mask. Ventilation

DAY	Pt ID NO	Duration	Complication	Certifiers Signatures

Code Blue

Date	Pt ID NO	Reason	Ward	Success/Failure (If Failure Reason)	Certifiers Signatures

### Intercoastal Tube Drianage (Icd) Placement

Date	Pt ID NO	Location	Indication	Supervised/Self	Complications	Certifiers Signatures

### Synchronised Cardioversion

Date	Pt ID NO	Location	Indication	No. Attempts	Success/Failure (If Failure Reason)	Certifiers Signatures

### Defibrillation

Date	Pt ID NO	Location	Indication	Complications	Certifiers Signatures

### Central Vein Access

Date	Pt ID NO	Site Of Access	Indication	No. Attempts	Complications	Certifiers Signatures

### Arterial Line Placement

Date	Pt ID NO	Location	Indication	No. Attempts	Complications	Certifiers Signatures

**CPR**

Date	Pt ID NO	Location	Indication	No Of Cycles	Complications	Certifiers Signatures

**Urinary Catheterization**

Date	Pt ID NO	Location	Indication	Complications	Success/Failure (If Failure Reason)	Certifiers Signatures

**Lumbar Puncture**

Date	Pt ID NO	Location	Indication	No. Attempts	Success/Failure (If Failure Reason)	Certifiers Signatures

**Ambulance Calls In Emergency (Trauma, Medical,)**

Date	No Pt No	Location	Reason	Dispatch Timing	Reaching Time	In Timing	Differential Diagnosis	Management	Certifiers Signatures

**Reduction of Fractures and Displacements**

Date	Pt ID No	Site	Dd	Self / Assist	Complications	Success/Failure (If Failure Reason)	Certifiers Signatures

### Initial Management of Burns

Date	Pt ID No	Site	Degree of burns	% of burns	Fluid calculation using parkland formula	Certifiers Signatures

### Parkland formula:

Fluid for first 24 hours (ml) = 4 \* Patient's weight in kg \* %BSA

### Incision And Drainage of Abscess

Date	Pt id no	Location	Diagnosis	Regional anatomy	complications	Certifiers Signatures

### Management of Epistaxis

Date	Pt id no	Location	Anterior/posterior/mixed	Drugs used	Certifiers Signatures

### Cooling/Warming Techniques for Hypothermia/Hyperthermia

Date	Pt id no	Location	Hypothermia/hyperthermia	Warming/Cooling methods	Certifiers Signatures

### Pop Application

Date	Site	Diagnosis	Material	Cast / slab	Certifiers Signatures

### Wound Dressing

Date	Pt id no	site	Type of dressing	Certifier Signatures

### Multi-Casualty Disaster

Date	Pt id no	Location	Reason	No of pt	Certifiers Signatures

### Suturing

Date	Pt id no	Material	Size	Site	No of bites	Certifiers Signatures

### Ryle's Tube Insertion

Date	Pt id no	Location	Indication	No of attempt	Conformation	Certifiers Signatures

## OVER ALL PERFORMANCE

	<b>Relationships with Colleagues</b>	<b>Rating (UNKNOWN / 1 - 5)</b>
1	Is a team-player	
2	Asks for others' point of view and advice	
3	Encourages discussion	
4	Shows empathy and sensitivity	
5	Is clear and precise with instructions	
6	Treats colleagues with respect	
7	Communicates well (incl. non-verbal communication)	
8	Is reliable	
9	Can lead a team well	
10	Takes responsibility	
	<b>Relationships with Patients</b>	<b>Rating (UNKNOWN / 1 - 5)</b>
1	Empathy and sensitivity	
2	Communicates well with all patient groups	
3	Treats patients and relatives with respect	
4	Appreciates the psycho-social aspects of patient care	
5	Offers explanations	
	<b>Good Clinical Care</b>	<b>Rating (UNKNOWN / 1 - 5)</b>
1	Medical knowledge and clinical skills	
2	Problem-solving skills	
3	Note-keeping – clarity; legibility and completeness	
4	Emergency Care skills	
	<b>Teaching and Training</b>	<b>Rating (UNKNOWN / 1 - 5)</b>
1	Teaching is structured	
2	Is enthusiastic about teaching	
3	Teaching is presented well	
4	Uses varied teaching skills	

	Global rating	Rating (UNKNOWN / 1 - 5)
	How would you rate this trainee's performance at this stage of training?	

No	Hospital Unit / Department	Duration	Starting Date to Ending date	Signature of HOD
1	Pre-Hospital Care / EMS / Ambulance Services	4 weeks		
2	Emergency Department (Casualty)	8 weeks		
3	Medical Intensive Care Unit (MICU)	6 weeks		
4	Surgical ICU (SICU)	4 weeks		
5	Neuro ICU (NICU)	3 weeks		
6	Cardiac ICU (CCU)	3 weeks		
7	Trauma Unit / Trauma ICU	4 weeks		
8	Post-Anaesthesia Care Unit (PACU)	4 weeks		
9	Operation Theatre (Emergency & Elective Surgeries)	1 weeks		
10	Anaesthesia Department	2 weeks		
11	Toxicology / Poison Management Unit	2 weeks		
12	Respiratory Therapy Unit / Pulmonology	1 week		
13	Radiology & Imaging (Emergency USG, CT, CXR, FAST)	1 week		
14	Burns Unit	2 week		
15	Dialysis Unit / Renal Emergency Care	1 week		
16	Labour Room & Obstetric Emergency Unit	2 weeks		
17	Paediatric Emergency / NICU / PICU	1 week		
18	Central Sterile Supply Department (CSSD)	1 week		
19	Disaster Management & Mass Casualty Simulation	2 weeks		

