Model Curriculum Handbook

PHYSIOTHERAPY

Ministry of Health and Family Welfare

Allied Health Section
# CONTENTS

Contributors to drafting and review................................................................................................................. 3
List of Abbreviations............................................................................................................................................. 5

## Chapter 1: Introduction to the Handbook ......................................................................................................... 9

- Who is an Allied and Healthcare Professional? ................................................................................................. 9
- Scope and need for allied and healthcare professionals in the Indian healthcare system ............................. 10
- Learning goals and objectives for allied and healthcare professionals ............................................................. 11
- Introduction of new elements in allied and healthcare education ...................................................................... 15
- Competency-based curriculum ................................................................................................................................. 15
- Promoting self-directed learning of the professionals .......................................................................................... 16
- Credit hours vs traditional system ......................................................................................................................... 16
- Integrated structure of the curriculum .................................................................................................................. 16
- Introduction of foundation course in the curriculum .......................................................................................... 17
- Learning methodologies ........................................................................................................................................ 17
- Assessment methods............................................................................................................................................ 18

## Chapter 2: Methodology of curriculum development ..................................................................................... 23

## Chapter 3: Background of the profession ....................................................................................................... 27

- Statement of Philosophy—Why this profession holds so much importance ..................................................... 27
- About Physiotherapy ........................................................................................................................................... 27
- Scope of practice ................................................................................................................................................ 27
- Recognition of Title and qualification ..................................................................................................................... 28
- Definition of Physiotherapy and Physiotherapist ................................................................................................. 30
- Education of the Physiotherapist ........................................................................................................................ 31
- Entry requirements ............................................................................................................................................... 31
- Course duration .................................................................................................................................................... 31
- Teaching faculty and infrastructure ...................................................................................................................... 32
- Job availability ..................................................................................................................................................... 32

## Chapter 4: Curriculum ....................................................................................................................................... 35

- Bachelors of Physiotherapy ................................................................................................................................. 39
- Introduction: ....................................................................................................................................................... 39
- Eligibility for admission: ...................................................................................................................................... 40
- Duration of the course ......................................................................................................................................... 40
- Medium of instruction: ....................................................................................................................................... 40
- Attendance: ......................................................................................................................................................... 40
- Assessment: ....................................................................................................................................................... 41
- Curriculum Outline ............................................................................................................................................ 43
- Skills Based Outcomes And Monitorable Indicators For Bachelor Of Physiotherapy .................................. 114

- Masters of Physiotherapy .................................................................................................................................. 123
- Introduction: ....................................................................................................................................................... 123
- Eligibility for admission: ...................................................................................................................................... 124
- Duration of the course ......................................................................................................................................... 125
- Medium of instruction: ....................................................................................................................................... 125
- Attendance: ......................................................................................................................................................... 125
- Methods of training ........................................................................................................................................... 125
- Assessment: ....................................................................................................................................................... 125
- Curriculum Outline ............................................................................................................................................ 127

MODEL CURRICULUM HANDBOOK OF PHYSIOTHERAPY
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### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AED</td>
<td>Automated External Defibrillator</td>
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<tr>
<td>AHP</td>
<td>Allied and Healthcare Professional</td>
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<td>BLS</td>
<td>Basic Life Support</td>
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<td>BMW</td>
<td>Bio Medical Waste</td>
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<td>BSc</td>
<td>Bachelor of Science</td>
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<tr>
<td>BVMs</td>
<td>Bag Value Masks</td>
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<tr>
<td>CATS</td>
<td>Credit Accumulation and Transfer System</td>
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<td>CBCS</td>
<td>Choice-Based Credit System</td>
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<tr>
<td>CbdD</td>
<td>Case-based Discussion</td>
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<tr>
<td>CBSE</td>
<td>Central Board of Secondary Education</td>
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<td>CNS</td>
<td>Central Nervous System</td>
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<td>CPR</td>
<td>Cardiopulmonary Resuscitation</td>
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<td>CPU</td>
<td>Central Processing Unit</td>
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<td>CR</td>
<td>Confidential Report</td>
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<tr>
<td>CVS</td>
<td>Cardio Vascular System</td>
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<td>DOPs</td>
<td>Direct observation of procedures</td>
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<tr>
<td>ECTS</td>
<td>European Credit Transfer System</td>
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<td>ESR</td>
<td>Erythrocyte Sedimentation Rate</td>
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<td>HSSC</td>
<td>Healthcare Sector Skill Council</td>
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<tr>
<td>ICT</td>
<td>Information &amp; Communication Technology</td>
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<td>JCI</td>
<td>Joint Commission International</td>
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<td>LAN</td>
<td>Local Area Network</td>
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<tr>
<td>M CEX</td>
<td>Mini Case Evaluation Exercise</td>
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<td>MoHFW</td>
<td>Ministry of Health and Family Welfare</td>
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<td>NABH</td>
<td>National Accreditation Board for Hospitals &amp; Healthcare Providers</td>
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<td>NCRC</td>
<td>National Curricula Review Committee</td>
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<td>NIAHS</td>
<td>National Initiative for Allied and Healthcare Sciences</td>
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<td>NSDA</td>
<td>National Skills Development Agency</td>
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<td>NSQF</td>
<td>National Skills Qualification Framework</td>
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<tr>
<td>OSCE</td>
<td>Objective Structured Clinical Examination</td>
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<td>OSPE</td>
<td>Objective Structured Practical Examination</td>
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<td>OSLER</td>
<td>Objective Structured Long Examination Record</td>
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<tr>
<td>PCV</td>
<td>Packed Cell Volume</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<td>PG</td>
<td>Post Graduate</td>
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<tr>
<td>TSU</td>
<td>Technical Support Unit</td>
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<td>UGC</td>
<td>University Grants Commission</td>
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<td>UG</td>
<td>Under Graduate</td>
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<td>UHC</td>
<td>Universal Health Coverage</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WWW</td>
<td>World Wide Web</td>
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Chapter 1

Introduction to the Handbook
Chapter 1: Introduction to the Handbook

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

Individually created for different professional groups of allied and healthcare, this handbook aims to reduce the variation in education by comprising of a standardized curriculum, career pathways, nomenclature and other details for each profession. The change from a purely didactic approach will create better skilled professionals and improve the quality of overall patient care. In the absence of a national standard-setting authority, this handbook can also guide the thousands of young adults who choose healthcare as a profession – not as physician or nurses but to play several other critical support roles – on the appropriate course of action to enable them to be skilled allied and healthcare professionals of the future.

Who is an Allied and Healthcare Professional?

The Ministry of Health and Family Welfare, accepted in its entirety the following definition of an allied and healthcare professional based on the afore-mentioned report:

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

Primary care refers to the work of health professionals who act as a first point of consultation for all patients within the health care system. Such a professional would usually be a primary care physician, such as a general practitioner or family physician, a licensed independent practitioner such as a physiotherapist, or a non-physician primary care provider (mid-level provider) such as a physician assistant or nurse practitioner. Depending on the locality, health system organization, and sometimes at the patient’s discretion, they may see another health care professional first, such as a pharmacist, a nurse (such as in the United Kingdom), a clinical officer (such as in parts of Africa), or an Ayurvedic or other traditional medicine professional (such as in parts of Asia). Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

Since the past few years, many professional groups have been interacting and seeking guidance on all those who would qualify under the purview of “allied and healthcare professionals”. In the healthcare system, statutory bodies exist for clinicians, nurses, pharmacists and dental practitioners; but a regulatory structure for around 50 professions is absent in India. Currently, the Government is considering these professions under the ambit of the allied and healthcare system. However, this number is subject to
changes and modifications over time, particularly considering how quickly new technologies and new clinical avenues are expanding globally, creating newer cadres of such professionals.

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

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

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

As the Indian government aims for Universal Health Coverage, the lack of skilled human resource may prove to be the biggest impediment in its path to achieve targeted goals. The benefits of having AHPs in the healthcare system are still unexplored in India. Although an enormous amount of evidence suggests that the benefits of AHPs range from improving access to healthcare services to significant reduction in the cost of care, the Indian healthcare system still revolves around the doctor-centric approach. The privatization of healthcare has also led to an ever-increasing out-of-pocket expenditure by the population. However, many examples assert the need of skilled allied and healthcare professionals in the system, such as in the case of stroke survivors, it is the support of AHPs that significantly enhance their rehabilitation and long term return to normal life. AHPs also play a significant role to care for patients who struggle mentally and emotionally in the current challenging environment and require mental health support; and help them return to well-being.⁴ Children with communication difficulties, the elderly, cancer patients, patients with long term conditions such as diabetes people with vision problems and amputees; the list of people and potential patients who benefit from AHPs is indefinite.

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

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

Learning goals and objectives for allied and healthcare professionals

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

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 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 medical 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 certain emergency care, 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 with the patient, and decide 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 patient’s ideas, beliefs and expectations 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 of physiotherapy
- 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 physiotherapy 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

• Advocate for the services and resources needed for optimal patient care

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 practice 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 new elements in allied and healthcare education

Competency-based curriculum

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

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

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

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

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

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

Credit hours vs traditional system

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

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

Integrated structure of the curriculum

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

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

The aim of an integrated curriculum is to lead students to a level of scientific fluency that is beyond mere fact and concept acquisition, by the use of a common language of medical science, with which they can begin to think creatively about medical problems.\(^1\)

This innovative new curriculum has been structured in a way such that it facilitates horizontal and vertical integration between disciplines; and bridges the gaps between both theory & practice, and between hospital-based practice and community practice. The amount of time devoted to basic and laboratory sciences (integrated with their clinical relevance) would be the maximum in the first year, progressively decreasing in the second and third year of the training, making clinical exposure and learning more dominant.\(^2\) 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**

<table>
<thead>
<tr>
<th>Teaching modality</th>
<th>Learning opportunity examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>Teach and assess in selected clinical scenarios</td>
</tr>
<tr>
<td></td>
<td>Practice soft skills</td>
</tr>
<tr>
<td></td>
<td>Practice physical examination</td>
</tr>
<tr>
<td></td>
<td>Receive feedback on performance</td>
</tr>
<tr>
<td>Mannequins</td>
<td>Perform acquired techniques</td>
</tr>
<tr>
<td></td>
<td>Practice basic procedural skills</td>
</tr>
<tr>
<td></td>
<td>Apply basic science understanding to clinical problem solving</td>
</tr>
<tr>
<td>Simulators</td>
<td>Practice teamwork and leadership</td>
</tr>
<tr>
<td></td>
<td>Perform cardiac and pulmonary care skills</td>
</tr>
<tr>
<td></td>
<td>Apply basic science understanding to clinical problem solving</td>
</tr>
<tr>
<td>Task under trainers</td>
<td>As specific to the physiotherapy profession. Joint manipulation, chest physiotherapy etc.</td>
</tr>
</tbody>
</table>

**Assessment methods**

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

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

- Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OSPE), Objective Structured Long Examination Record (OSLER)
• Mini Case Evaluation Exercise (CEX)
• Case-based discussion (CBD)
• Direct observation of procedures (DOPs)
• Portfolio
• Multi-source feedback
• Patient satisfaction questionnaire

An objective structured clinical examination (OSCE) is used these days in a number of allied and healthcare courses, e.g. Optometry, Physiotherapy, and Radiography. It tests the performance and competence in communication, clinical examination, and medical procedures/prescriptions. In physiotherapy, orthotics, and occupational therapy, it tests exercise prescription, joint mobilization/manipulation techniques; and in radiography it tests radiographic positioning, radiographic image evaluation, and interpretation of results. The basic essential elements consist of functional analysis of the occupational roles, translation of these roles (“competencies”) into outcomes, and assessment of trainees' progress in these outcomes on the basis of demonstrated performance. Progress is defined solely by the competencies achieved and not the underlying processes or time served in formal educational settings. Most methods use predetermined, agreed assessment criteria (such as observation check-lists or rating scales for scoring) to emphasize on frequent assessment of learning outcomes. Hence, it is imperative for teachers to be aware of these developments and they should suitably adopt them in the allied and healthcare education system.
Chapter 2
Methodology of Curriculum Development
Chapter 2: Methodology of curriculum development

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

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

- Audiology and Speech Pathology
- Orthotics and Prosthetics

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

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

Steps undertaken in the curricula review process –

1. Curricula were sought from various States and institutions across the country in response to which the NIAHS TSU reviewed–
   a. 118 curricula of allied and healthcare courses (different levels and different professions) from 10 states across the country;
   b. 133 curricula of various allied and healthcare courses collected during phase-I of the NIAHS project.
2. Literature review – a comprehensive literature review was undertaken resulting in a detailed curriculum of the allied and healthcare courses, which included competency and skills-based
models followed nationally as well as internationally, methodologies of curriculum development, assessment protocols, and many such aspects of curriculum development. The literature review helped the TSU to develop a reference document that comprised of a standard framework for a competency-based curriculum to be followed for the curricula review and redesign. A detailed mapping of all the resources was undertaken and shared with the taskgroup experts via email.

3. Constitution of the National Curricula Redesign Taskforces for various professional groups – Specific taskforces were then instituted comprising of technical as well as subject experts who were engaged in the process of redesigning the curriculum.

4. Constitution of the National Curricula Review Committee (NCRC) – The NCRC comprising of experts with versatile and immense experiences of their respective domain, was then constituted for final review and approval on the curriculum drafted by the taskforce and NIAHS TSU.

5. National Curricula Redesign Taskforce Consultations – a series of consultations were conducted with subject experts including both regional and national taskgroup experts to develop a ‘skill and competency’ framework for education and career pathways. The consultations were facilitated by the NIAHS TSU members and were led by the chairperson of the group. Post this, the draft version and recommendations were compiled by the TSU members and sent to the experts for final review and consent.

6. Local consultations – These were also conducted in different hospitals and other healthcare settings to get suggestions, feedbacks and ideas from the subject experts for their respective curricula.

7. Response draft – Comments and suggestions were received on the draft and a response draft curriculum was prepared, which was then re-circulated for final consent and validation by the taskgroup experts.

8. Submission and approval of draft curriculum – The final draft of the curriculum handbook was then submitted by the taskforce chairman to the National Curricula Review Committee for approval and final sign-off.

9. Public opinion – The handbook was uploaded to seek public opinion from national and international experts, students, faculty, and practitioners of the respective professional groups.

10. Final approval by the NCRC - The comments and suggestions by the public were then reviewed and considered for any possible modification by the taskforce group. The final approval and sign off for the overall structure was then sought from NCRC.

11. Dissemination - The final handbook (guidelines) is disseminated by the Ministry of Health and Family Welfare for further adoption and incorporation by institutes/universities as applicable to ensure standardization.
Chapter 3

Background of the profession
Chapter 3: Background of the profession

Statement of Philosophy– Why this profession holds so much importance

Physiotherapy practice spans the continuum from health promotion to prevention to rehabilitation for individuals and populations throughout the lifespan. Physiotherapy diagnoses movement dysfunctions based on skillful examination and evaluation regardless of the cause or etiology and provide skilled therapeutic intervention to foster improvement in physical functioning and maximizing overall quality of life. Physiotherapists provide the initial access into the health care system for persons with impairments and functional limitations amenable to physiotherapy and engage in collegial referral relationships with other health care professionals.

Physiotherapist's role also includes that of case manager, teacher, researcher, and consultant. The faculty believes the first priority of education is to prepare people for a well-rounded, balanced life with broad social and cultural interests and as involved, active citizens of our country.

Physiotherapist must have commitments to lifelong learning and to search for the evidence that supports and advances practice. Critical thinking, problem solving, intellectual perseverance and courage are all essential characteristics of the successful physiotherapist.

About Physiotherapy

Physiotherapists are health care professionals with a significant role in health promotion and treatment of injury and diseases. They combine their in-depth knowledge of the body and how it works with specialized hands-on clinical skills to assess, diagnose and treat symptoms of illness, injury or disability.

All physiotherapists registered to practice are qualified to provide safe and effective physiotherapy. They have met national entry-level education and practice standards, and have successfully passed a standardized physiotherapy competence examination.

Scope of practice

Physiotherapists plan and administer physiotherapy/ rehabilitation treatments independently and also being a part of the multidisciplinary team. The minimum education requirement is often a baccalaureate degree or postgraduate degrees in Physiotherapy.

Physiotherapy is an essential part of the health and community/welfare services delivery system. Physiotherapists practice independently of other health care/service providers and also within multidisciplinary rehabilitation/habilitation programmes to prevent, gain, maintain or restore optimal function and quality of life in individuals with loss and disorders of movement.

Physiotherapists are guided by their own code of ethical principles. Thus, they may be concerned with any of the following purposes:

1. Promoting the health and well-being of individuals and the general public/society, emphasizing the importance of physical activity and exercise.

2. Preventing impairments, activity limitations, participatory restrictions and disabilities in individuals at risk of altered movement behaviors due to health or medically related factors, socio-economic stressors, environmental factors and lifestyle factors.
3. Providing interventions/treatment to restore integrity of body systems essential to movement, maximize function and recuperation, minimize incapacity, and enhance the quality of life, independent living and workability in individuals and groups of individuals with altered movement behaviors resulting from impairments, activity limitations, participatory restrictions and disabilities

4. Modifying environmental, home and work access and barriers to ensure full participation in one’s normal and expected societal roles

Physiotherapists may also contribute to the development of local, national and international health policies and public health strategies.

**Settings in which physiotherapy is practiced**

Physiotherapy is delivered in a variety of settings which allow it to achieve its purpose. Prevention, health promotion, treatment/intervention, habilitation and rehabilitation take place in multiple settings that may include, but are not confined to, the following:

1. Community based rehabilitation programmes
2. Community settings including primary health care centres, individual homes, and field settings
3. Education and research centres
4. Fitness clubs, health clubs, gymnasia and spas
5. Hospices
6. Hospitals
7. Nursing homes
8. Occupational health centres
9. Out-patient clinics
10. Physiotherapist private offices, practices, clinics
11. Prisons
12. Public settings (e.g., shopping malls) for health promotion
13. Rehabilitation centres and residential homes
14. Schools, including pre-schools and special schools
15. Senior citizen centres
16. Sports centres/clubs
17. Workplaces/companies

**Recognition of Title and qualification**

Within the multidisciplinary team, the professional responsible for administrating physiotherapy treatment also at times referred to as the physiotherapist. The terminology Physiotherapist is an internationally adopted nomenclature and thus should also be applicable in an Indian context.

**The recommended title thus stands as the “Physiotherapist” with the acronym –“PT” for this group of professionals.**

It is a known fact that with the career advancement, the nomenclature will also vary and will also depend on the sector and profile of the professional. Considering the 10 NSQF levels designed by the NSDA, the following level progression table has been proposed by the taskforce to map the
nomenclature, career pathways and progression in different sectors of professional practice for Physiotherapist.

The table 2 below indicates the various channels of career progression in three distinct sectors such as clinical setting, academic and research route. It is envisaged that the physiotherapist will have one entry pathway – students with baccalaureate. The level of responsibility will increase as the career progresses and will starts with level six (6) for baccalaureate holders. The table also indicates the corresponding level of qualification with experience required by the professional to fulfill the requirements of each level. Considering the extent of patient dealing in case of physiotherapist and such other professions, government aims to phase out the Diploma and PG Diploma level courses and promote bachelor and master degree courses. In the academic front, as per UGC guidelines, to work at the position of a Lecturer/Assistant Professor the candidate must attain master degree. The table also indicates that career progression of physiotherapist is up to the level 10, however it needs to be stated that therapy prescription of patients, department management and final Clinical decision will be with the treating physiotherapist, unit head and Head of Physiotherapy department.

**Table 2 Nomenclature based on career progression for Physiotherapist**

<table>
<thead>
<tr>
<th>Levels</th>
<th>Clinical (Designation)</th>
<th>Academic (Designation)</th>
<th>Research (Designation)</th>
<th>Eligibility &amp; Experience</th>
<th>Annual performance based appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 6</td>
<td>Physiotherapist</td>
<td>Tutor</td>
<td>Professio nal Field Worker</td>
<td>Fresh BPT</td>
<td>• Proficiency test CR, self-appraisal &amp; HOD/Principal’s Appraisal/year</td>
</tr>
<tr>
<td>Level 7</td>
<td>Senior Physiotherapist</td>
<td>Lecturer</td>
<td>Junior Research Fellow</td>
<td>5 years of experience as Physiotherapist (BPT)/Fresh MPT</td>
<td>• Proficiency test CR, self-appraisal &amp; HOD/Principal’s Appraisal/year • 2 Conference presentation • 1 publication during tenure period</td>
</tr>
<tr>
<td>Level 8</td>
<td>Chief Physiotherapist</td>
<td>Assistant Professor</td>
<td>Research Fellow</td>
<td>For Clinical, Five years’ experience in the post of senior physiotherapist for BPT and for MPT its 5 years. For Academic And Research Fresh MPT-Exclusively (.55 % required for taking Academic (Designation as per UGC Norms)</td>
<td>• Proficiency test CR, self-appraisal &amp; HOD/Principal’s Appraisal/year • 2 Conference presentation • 2 publications during tenure period • Enrollment for PhD</td>
</tr>
<tr>
<td>Level 9</td>
<td>Superintendent Physiotherapist / Deputy Director PT</td>
<td>Associate Professor</td>
<td>Senior research Fellow</td>
<td>For Clinical including 5 years’ experience as chief Physiotherapist For Academic And Research 8 years as Assistant Professor</td>
<td>• Proficiency test CR &amp; Self-appraisal/year • 2 Conference presentation • 3 publications(as first author) during tenure period</td>
</tr>
<tr>
<td>Levels</td>
<td>Clinical (Designation)</td>
<td>Academic (Designation)</td>
<td>Research (Designation)</td>
<td>Eligibility &amp; Experience</td>
<td>Annual performance based appraisal</td>
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<td>------------------------------------</td>
</tr>
<tr>
<td>Level 10</td>
<td>Director Physiotherapist/Head of the Physiotherapy Department</td>
<td>Professor/Principal/Dean</td>
<td>Research Head</td>
<td>For Clinical Including 5years’ experience as Deputy Director PT/Superintendent Physiotherapist For Academic And Research (Designation as per UGC Norms) 5 years’ experience as Associate Professor PhD(Desirable)</td>
<td>• 5 Publication(as first author) during tenure period • PhD (desirable) (Designation as per UGC Norms) • Judgment on all aspects of Physiotherapy work and protocol development on treatment delivery and quality assurance</td>
</tr>
</tbody>
</table>

A relaxation of 5% may be provided at the graduate and master’s level for the Scheduled Caste/Scheduled Tribe/Differently-abled (Physically and visually differently-abled) categories for the purpose of eligibility and for assessing good academic record during direct recruitment to teaching positions. The eligibility marks of 55% marks (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 on only the qualifying marks without including any grace mark procedures.

*Persons entering the teaching profession in universities and colleges shall be designated as Assistant Professors and shall be placed in the Pay Band of Rs.15600-39100 with AGP of Rs.6000. Lecturers already in service in the Pre-revised scale of Rs8000-13500, shall be re-designated as Assistant Professors with the said AGP of Rs.6000. (Ref: HRD regulation No.1-32/2006-U.II/U.I(1) dated 31st December,2008)

**Definition of Physiotherapy and Physiotherapist**

"Physiotherapy means a system which includes comprehensive examination, treatment, advice and instructions to any persons preparatory to or for the purpose of or in connection with movement/functional dysfunction, bodily malfunction, physical disorder, disability, healing and pain from trauma & disease, physical and mental conditions using physical agents, activities & devices including exercise, mobilization, manipulations, electrical & thermal agents and other electro therapeutics for prevention, screening, diagnosis, treatment, health promotion and fitness."

This includes treatment preparation, planning, treatment delivery, clinical and rehabilitative care of the patient on a daily basis during treatment and immediate post treatment review. However, the role of the PT always encompasses the safe and accurate delivery of the physiotherapy treatment. As the physiotherapy professional in daily contact with the patient it also includes monitoring of daily improvement of the patient according to his/her condition. Furthermore the PT’s liaise with all the other associated professionals in ensuring that the needs of the patient are met.
Physiotherapists assess, plan and implement rehabilitative programs that improve or restore human motor functions, maximize movement ability, relieve pain syndromes, and treat or prevent physical challenges associated with injuries, diseases and other impairments. They apply a broad range of physical therapies and techniques such as movement, ultrasound, heating, laser and other techniques. They may develop and implement programmes for screening and prevention of common physical ailments and disorders.

Education of the Physiotherapist

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 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.

Entry requirements

The students entering the PT program should have completed the recognized secondary school studies as the qualification stipulated for physiotherapy course (degree) is 10+2 or equivalent examination with science subject from a recognized university or board which would provide the foundation for and prepare them for higher education studies.

Course duration

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

- 4 years and six months program (including six months of internship) - Bachelor's degree level

- 2 year program – Master’s degree level

The emphasis initially should be on the academic content establishing a strong scientific basis and in the later year on the application of theory to clinical/reflective practice. In Bachelor degree program minimum one year (starting from 2nd year onwards) should be devoted to clinical practice and this should be on a continuum of rotation from theory to practice over the program. The aim of the 4 and 1/2 year degree program is to enable the development of the PT as a key member of the multidisciplinary team and to enable him/her to execute advanced preparation/planning/delivery of physiotherapy treatment as well as quality assurance.

With the change in the disease dynamics and multifold increase in the cases needing physiotherapy treatment, it is imperative that a well-structured program 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 program is recommended with minimum of two years of education.
in specialized field of physiotherapy. The post graduate students can contribute significantly in research and academics.

PhD also play a significant role in the academic system of physiotherapy, however the curriculum has not indicated any prescriptive guidelines for that level apart from mapping it on the career and qualification map.

**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. Large lecture theatres may be appropriate, but smaller teaching areas should also be provided for tutorial and problem/case-based learning approaches.

It is recommended that a faculty and student ratio of 1:3 for PG and for UG 1:10 to be followed.

**Job availability**
As per ILO documentation, employers worldwide are looking for job applicants who not only have technical skills that can be applied in the workplace, but who also can communicate effectively, including with customers; can work in teams, with good interpersonal skills; can solve problems; have good ICT skills; are willing and able to learn; and are flexible in their approach to work. Graduates can expect to be employed in hospitals and private practices as physiotherapists. A career in research, following the completion of a higher degree such as a PhD, is an option chosen by some graduates. Graduates are eligible for employment overseas where their qualifications, training and experience are highly regarded.

Graduates have good employment prospects, and will enter a field in which the demand for professionals has increased in recent years and will keep on increasing due to chronic conditions, lifestyle change. An ageing population requiring increased medical rehabilitation services, together with the continuing introduction of hi-tech equipment, ensures strong demand for future graduates.
Chapter 4
Curriculum of Physiotherapy courses
Chapter 4: Curriculum

Background

The need for quality in treatment is a critical component of physiotherapy and requires knowledge and understanding of the basic sciences as well as the interaction between the techniques and procedures used in physiotherapy. In an era of greater complexity of technology and techniques, the role of the physiotherapist (PT) and his/her level of responsibility is continually evolving and expanding. Given the complexity of modern physiotherapy, the recognition of the profession of PT and development of dedicated education programmes specific to that profession must be addressed. Education programmes should provide the PT with the scientific theoretical foundation of the profession and enable them, as practitioners, to be able to synthesize, evaluate and apply their knowledge in a clinical setting.

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

- Technically and clinically competent for independent decision making;
- Enable to assess a patient;
- Aware of patient conditions and treatment along with the importance of quality assurance;
- Understand the theoretical basis for evidence based practice;
- Effective members of the multidisciplinary team;
- Prepared to participate in or initiate research into practice;

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

The National Curriculum Taskforce on Physiotherapy and NIAHS TSU has successfully designed the career and qualification map indicating the growth opportunities for a professional in the career pathway based on the level as indicated in the National Skills Qualification Framework (NSQF). The career pathway indicates level 6 as the entry level after the completion of a minimum 3.5/4.5 years of degree level program on physiotherapy (Bachelor in physiotherapy). The component of the programs starting from degree and above has been detailed out in the coming chapters.

Foundation course has also been designed to bring all the students at the same level of understanding with respect to basic healthcare related norms before the start of a career in a healthcare professional course. The foundation course is mandatory for all the allied and healthcare professional courses and for entry level courses also.
4.1. Bachelor in Physiotherapy
Bachelors of Physiotherapy

Introduction:

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

1. The purpose of this curriculum is to delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team.
2. Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
3. Able to operate and maintain physiotherapy equipment used in treatment of patient, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.
4. Able to provide patient education about various physiotherapeutic interventions to the patient and care givers.

Expectations from the future physiotherapy graduates

1. Coursework entitles independent physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat movement disorders as per red and yellow flags.
3. Course works will skill the graduate’s physical/functional diagnosis, treatment planning, management, administration of physiotherapy treatment and for patient support.
4. Graduates can found employment opportunities in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation /Health planning boards/health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
5. Physiotherapy graduate is encouraged to pursue further qualification to attain senior position in the professional field and also to keep abreast with the recent advances, new technology and research. The professional should opt for continuous professional education credits offered by national and international institutes.

Terminal Objectives (Expected Outcomes):

6. The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.
7. The graduate will utilize critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
8. The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.
9. The graduate will demonstrate lifelong commitment to learning and professional development.
Eligibility for admission:

Selection procedure:

1. He/she has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with pass marks (50%) in physics, chemistry and biology (botany & zoology), mathematics.(i.e. Physics, chemistry and biology as mandates requirements).

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.

3. 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.
   a. English, Physics, Chemistry, Botany, Zoology
   b. English, Physics, Chemistry, Biology and any other language

4. He/she has attained the age of 17 years as on current year

5. 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.

6. Admission to Bachelor of Physiotherapy course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.
   a. Entrance test, to be conducted by the university as per the syllabus under 10 +2 scheme
   b. Successful candidates on the basis of written test will be called for counseling(s) nominated by the University or the board.
   c. During subsequent counseling(s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.
   d. Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.
   e. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course without giving any notice will be governed as per the respective University rules.

Duration of the course

Duration of the course: 4 years or 8 semesters. (Total of 4320 hours in theory, practical & clinical) and minimum 960 hours of internship (to be completed in six months duration).

Total hours - 5280

Medium of instruction:

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

Attendance:

A candidate has to secure minimum-
1. 75% attendance in theoretical
2. 85% in Skills training (practical) for qualifying to appear for the final examination.

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

**Assessment:**
Assessments should be completed by the academic staff, based on the compilation of the student’s theoretical & clinical performance throughout the training program. To achieve this, all assessment forms and feedback should be included and evaluated. The passing marks for every subject in the semester should be 50% marks in aggregate in theory/practical.

**Commencement of the course -**
The course shall commence not later than 1st September of an academic year

**Commencement of examination -**
University examination will be conducted at the end of each semester.

**Working days during the semester -**
Each semester shall consist not less than 100 working days excluding examination days.

**Marks qualifying for pass -**
50% marks in aggregate in theory and Practical is required.

**Promotion criteria etc. will be as prescribed by the Universities affiliated by the UGC.**

Promotion criteria to the next year shall be as prescribed by the University. However, it is recommended that students may be permitted to next year only if the number of failed subject is two or less than two and Student must clear these subjects before appearing for the final examination of next year. For example failed subjects of I year must be cleared before appearing for 4th Semester examination and before the 6th Semester examination in case of failed subjects of II year and so on.

Only after passing all the subjects in all semesters he/she will be allowed to undergo internship.

**Review of answer papers of failed candidates -**
As per the regulations prescribed for review of answer papers by the University.

**Re-admission after break of study -**
1. Candidates having a break of study of five years and above from the date of admission and more than two spells of break will not be considered for readmission
2. The five years period of break of study shall be calculated from the date of first admission of the candidate to the course for the subsequent spells of break of study
3. Candidates having break of study shall be considered for re admission provided that they are not subjected to any disciplinary action and no charges are pending or contemplated against them.
4. All re admissions of candidates are subjected to the approval of the Vice Chancellor.
5. The candidates having a break of study up to five years shall apply for readmission to the Registrar of this University. The candidates shall be granted exemption in the subjects they have already passed.

**Maximum duration of the program -**

Candidates should complete the Bachelor of Physiotherapy degree course within a period of eight years from the date of joining in the course.

**Discharge from the program –**

1. “If a student admitted to a course of study in an University and for any reason not able to complete the course or qualify for the degree by passing the examinations prescribed within a period comprising twice the duration prescribed in the Regulations for the concerned course, he/she will be discharged from the said course, his/her name will be taken off the rolls of the University and he/she will not be permitted to attend classes or appear for any examination conducted by the University thereafter.”

2. “In respect of courses where internship is prescribed and if a student is for any reason not able to complete the internship within a period comprising twice the duration prescribed in the Regulations for the concerned course, such cases will be placed before a Committee to be constituted by the Vice-Chancellor for making appropriate decision on a case to case basis, based on individual merits.

3. “The course of study shall mean and include all the undergraduate, post graduate diploma/degree broad and super specialty courses in medical and all the other Faculties of the University”.

4. The above Regulations shall be applicable to all students already admitted and to be admitted to a course of study in an University.”

5. “Notwithstanding anything contained in the foregoing, the students who fall in the category clause I above and who are in the final year of the respective courses be given one more last and final chance to appear for the University Examination with a condition that if they do not pass the examination even in their last chance, they shall be discharged from the course. The Controller of Examinations will admit such candidate to the University examinations only after their producing an undertaking (as per format given in students manual) to this effect.”

**Migration/transfer of candidates -**

The Vice Chancellor shall have the powers to place any migration/transfer he deems fit in the Board of Management and get approval for grant of permission for migration/transfer to candidates undergoing course of study in another University as prescribed by university

**Vacation -**

The Head of the Institution may declare 45 days of vacation in an academic year to the students without a semester break. The period(s) of vacation can be decided by the Head of the Institution.
Internship -

All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a continuous period of 6 months approved by the college after passing all examinations in all subjects.

Classification of successful candidates -

A successful candidate

1. Who secures 75% and above in the aggregate marks shall be declared to have secured ‘FIRST CLASS WITH DISTINCTION’ provided he/she passes the whole examination in the FIRST ATTEMPT;

2. Who secures above 60% and less than 75% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the ‘FIRST CLASS, provide he/she passes the whole examination in the FIRST ATTEMPT’;

3. Who secures above 50% and less than 60% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the ‘SECOND CLASS’; and

All other successful candidates shall be declared to have PASSED the examinations.

Curriculum Outline

First Semester (0-6 months)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-001</td>
<td>Human Anatomy-1</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>BPT-002</td>
<td>Human Physiology -1</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>BPT-003</td>
<td>Biochemistry</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>BPT-004</td>
<td>Sociology</td>
<td>45</td>
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Foundation course - Internal examination

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
</tr>
</thead>
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<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-005</td>
<td>Introduction to Healthcare Delivery System in India</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>BPT-006</td>
<td>Basic computer and information science</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>BPT-007</td>
<td>English, Communication and soft skills</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>PBL/Assignment/ICT learning</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Community orientation and clinical visit</td>
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<td>Total</td>
<td>285</td>
<td>165</td>
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Second Semester (7 – 12 months)

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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-008</td>
<td>Human Anatomy-2 (Including Applied Anatomy)</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>BPT-009</td>
<td>Human Physiology -2 (Including Applied Physiology)</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>BPT-010</td>
<td>General and Clinical Psychology</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>BPT-011</td>
<td>Basic principles of Biomechanics</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Foundation course - Internal examination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
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</tr>
<tr>
<td>BPT-012 Medical terminology and record keeping</td>
<td>30</td>
<td>30</td>
<td>2</td>
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<tr>
<td>PBL/Assignment/ICT learning/Integrated seminar</td>
<td>45</td>
<td>3</td>
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<tr>
<td>Clinical observation</td>
<td>75</td>
<td>75</td>
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<td>Total</td>
<td>240</td>
<td>255</td>
<td>540</td>
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**Third Semester (13-18 months)**

<table>
<thead>
<tr>
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<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-013</td>
<td>Pathology</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>BPT-014</td>
<td>Microbiology</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>BPT-015</td>
<td>Pharmacology</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>BPT-016</td>
<td>Biomechanics and kinesiology</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>BPT-017</td>
<td>Foundation of Exercise Therapy and therapeutic massage</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td><strong>Foundation course – Internal examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-018</td>
<td>Introduction to quality and patient safety( Including Emergency care, BLS, Biomedical waste management, Infection prevention and control, etc)</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Clinical observation</td>
<td>75</td>
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<tr>
<td><strong>Total</strong></td>
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**Fourth Semester (19-24 months)**

<table>
<thead>
<tr>
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<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-019</td>
<td>Exercise Therapy</td>
<td>75</td>
<td>105</td>
</tr>
<tr>
<td>BPT-020</td>
<td>Bio physics</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>BPT-021</td>
<td>Electrotherapy (LMHF &amp; Equipment care)</td>
<td>75</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td><strong>Foundation course – Internal examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-022</td>
<td>Medical/ Physiotherapy Law and Ethics</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Clinical Education</strong></td>
<td></td>
<td>90</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>195</td>
<td>345</td>
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**Fifth Semester (25-30 months)**

<table>
<thead>
<tr>
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<th>Hours</th>
<th>Weekly class hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-023</td>
<td>Clinical Orthopedics &amp;Traumatology</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>BPT-024</td>
<td>General Surgery including burns and plastic surgery &amp; Obstetrics and Gynecology</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>BPT-025</td>
<td>General Medicine, Paediatrics &amp; psychiatry</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>BPT-026</td>
<td>Community Medicine</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Not for university examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-027</td>
<td>Evaluation Methods &amp; Outcome Measures</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>BPT-028</td>
<td>Diagnostic imaging for Physiotherapist</td>
<td>15</td>
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<tr>
<td></td>
<td>Clinical education</td>
<td>195</td>
<td>195</td>
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<td><strong>Total</strong></td>
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<td>285</td>
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Sixth Semester (31-36 months)

<table>
<thead>
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<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-029</td>
<td>Physiotherapy in Orthopedics &amp; sports</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>BPT-030</td>
<td>Physiotherapy In General Medicine and General</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-031</td>
<td>Clinical Neurology &amp; Neurosurgery</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Not for university examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-032</td>
<td>Professionalism and values</td>
<td>15</td>
<td>-</td>
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<tr>
<td></td>
<td>Clinical education</td>
<td>195</td>
<td>195</td>
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<td><strong>Total</strong></td>
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<td>360</td>
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Seventh Semester (37-42 months)

<table>
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<tr>
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<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-033</td>
<td>Physiotherapy in Neurology &amp; psychosomatic disorder</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>BPT-034</td>
<td>Biostatistics &amp; Research Methodology</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>BPT-035</td>
<td>Health Promotion and Fitness</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>BPT-036</td>
<td>Clinical cardiovascular &amp; pulmonary</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td><strong>Not for university examination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-037</td>
<td>Principles of Management</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>BPT-038</td>
<td>Critique inquiry, case presentation and discussion</td>
<td></td>
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<tr>
<td></td>
<td>Clinical education</td>
<td>195</td>
<td>195</td>
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<td><strong>Total</strong></td>
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<td>315</td>
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Eighth Semester (43-48 months)

<table>
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<tr>
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<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td>BPT-039</td>
<td>Physiotherapy in cardiovascular, pulmonary &amp;</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>intensive care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPT-040</td>
<td>Community Physiotherapy</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>BPT-041</td>
<td>Clinical reasoning &amp; Evidence based physiotherapy</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>BPT-042</td>
<td>Administration and Teaching Skills</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Research Project</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Clinical education</td>
<td>195</td>
<td>195</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>150</td>
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Ninth Semester

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course Titles</th>
<th>Hours</th>
<th>Weekly class hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Theory</td>
<td>Practical</td>
</tr>
<tr>
<td></td>
<td>Internship</td>
<td>960</td>
<td>(minimum)</td>
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<td></td>
<td>Total</td>
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</table>

INTERNSHIP – Minimum 960 hours (calculated based on 8 hours per day, if 120 working days in six month span)
HUMAN ANATOMY I

SUBJECT DESCRIPTION - It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies.

THEORY –

1. Histology : General Histology, study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue – TS & LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.

2. Embryology
   a. Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.
   b. Development of skin, Fascia, blood vessels, lymphatic,
   c. Development of bones, axial and appendicular skeleton and muscles,
   d. Neural tube, brain vessels and spinal cord,
   e. Development of brain and brain stem structures

3. Regional Anatomy
   a. Thorax:
      i. Cardio – Vascular System Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.
      ii. Respiratory system - Outline of respiratory passages: Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.
      iii. Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.
      iv. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

   b. Abdomen:
      i. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
      ii. Large blood vessels of the gut.
      iii. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.

   c. Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.
d. Endocrine glands: Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus.

HUMAN PHYSIOLOGY – I

SUBJECT DESCRIPTION: The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body. The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system.

THEORY

1. General Physiology
   a. Cell: Morphology. Organelles: their structure and functions
   b. Transport Mechanisms across the cell membrane

2. Blood
   a. Introduction: Composition and functions of blood.
   d. WBC: Classification. Morphology, functions, count, its variation of each. Immunity
   e. Platelets: Morphology, functions, count, its variations
   g. Blood Groups: Landsteiner’s law. Types, significance, determination, Erythroblastosis foetalis.
   i. Lymph: Composition, formation, circulation and functions.

3. Nerve Muscle Physiology
   c. Neuroglia: Types and functions.

4. Cardiovascular System


e. Arterial pulse.

f. Shock – Definition. Classification–causes and features

g. Regional Circulation: Coronary, Cerebral and Cutaneous circulation.

h. Cardiovascular changes during exercise.

5. Respiratory System -


d. Dead Space: Types and their definition.


i. Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types Artificial respiration

j. Respiratory changes during exercise.

6. Digestive System -

a. Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system


e. Pancreatic Secretion: Composition, production, function. Regulation.

f. Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall
bladder: Functions.
g. Intestine: Succus entericus: Composition, function and regulation of secretion. Intestinal
motility and its function and regulation.
h. Mechanism of Defecation.

7. Endocrine System -
   Functions of hormones
b. Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells,
   action on target cells, regulation of secretion of each hormone. Disorders: Gigantism,
   Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development:
   hormonal and other influences.
c. Pituitary-Hypothalamic Relationship.
d. Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage,
   action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave’s disease.
e. Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders:
f. Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion
   of Aldosterone, Cortisol, and Androgens. Disorders: Addison’s disease, Cushing’s
   syndrome, Conn’s syndrome, Adrenogenital syndrome.
g. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and
   noradrenaline. Disorders: Phoeochromocytoma.
h. Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and
i. Calcitrol, Thymus and Pineal gland (very brief).
j. Local Hormones. (Briefly).

PRACTICALS – Practical classes include hematology experiments, clinical examinations, amphibian
chart, and recommended demonstrations.

1. Haematology: To be done by the students
   a. Study of Microscope and its uses
   b. Determination of RBC count
   c. Determination of WBC count
d. Differential leukocyte count
   e. Estimation of hemoglobin
   f. Calculation of blood indices
g. Determination of blood groups
   h. Determination of bleeding time
   i. Determination of clotting time

Demonstrations only
   j. Determination of ESR
   k. Determination of PCV

   a. Simple muscle curve.
   b. Effect of increasing the strength of the stimuli
   c. Effect of temperature on muscle contraction
   d. Effect of two successive stimuli.
   e. Effect of Fatigue.
   f. Effect of load on muscle contraction
   g. Genesis of tetanus and clonus.
   h. Velocity of impulse transmission.

**BIOCHEMISTRY**

**THEORY**

1. Nutrition –
   b. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person
   c. Balanced diet
      i. Recommended dietary allowances
      ii. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers
      iii. Role of lipids in diet
      v. Nutritional disorders.

2. Carbohydrate Chemistry –
   a. Definition, general classification with examples, Glycosidic bond
   b. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides.
   c. Glycosaminoglycan (mucopolysaccharides)

3. Lipid Chemistry –
   a. Definition, general classification
   b. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol
   c. Essential fatty acids and their importance
   d. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies

4. Amino-acid Chemistry –
   a. Amino acid chemistry: Definition, Classification, Peptide bonds
   b. Peptides: Definition, Biologically important peptides
   c. Protein chemistry: Definition, Classification, Functions of proteins,

5. Enzymes –
a. Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)

6. Nucleotide and Nucleic acid Chemistry -
   b. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.

7. Digestion and Absorption -

8. Carbohydrate Metabolism -
   a. Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
   b. Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle
   c. Hormonal regulation of glucose, Glycosuria, Diabetes mellitus.

9. Lipid Metabolism -
   a. Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids,
   b. Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues
   c. Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis, Rothera’s test.
   d. Cholesterol metabolism: synthesis, degradation, cholesterol transport
   e. Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) Hypcholesterolemic agents, Common hyperlipoproteinemia, Fatty liver

10. Amino acid and Protein Metabolism -
    a. Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle
    b. Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine.

11. Vitamins -
    a. Definition, classification according to solubility,
    b. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.

12. Mineral Metabolism-
    a. Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.

13. Cell Biology -

14. Muscle Contraction -
a. Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction.

15. Biochemistry of Connective tissue -

16. Hormone Action -
   a. Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function.

17. Acid-Base balance -

18. Water balance -
   a. Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre.

19. Electrolyte balance -
   b. Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF.

20. Clinical Biochemistry -
   a. Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

SOCIOLOGY

SUBJECT DESCRIPTION - Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

THEORY

1. Introduction:
   a. Meaning- Definition and scope of sociology
   b. Its relation to Anthropology, Psychology, Social Psychology.
   c. Methods of Sociological investigations- Case study, social survey, questionnaire, interview and opinion poll methods.
   d. Importance of its study with special reference to Health Care Professionals.

2. Social Factors in Health and disease situations:
   a. Meaning of social factors
   b. Role of social factors in health and illness

3. Socialization:
   a. Meaning and nature of socialization.
   b. Primary, Secondary and Anticipatory socialization.
   c. Agencies of socialization.

4. Social Groups:
   a. Concepts of social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and
5. Family:
   a. The family, meaning and definitions.
   b. Functions of types of family
   c. Changing family patterns
   d. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

6. Community:
   a. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.
   b. Urban community: Meaning and features- Health hazards of urbanities.

7. Culture and Health:
   a. Concept of Health
   b. Concept of Culture
   c. Culture and Health
   d. Culture and Health Disorders

8. Social change:
   a. Meaning of social changes.
   b. Factors of social changes.
   c. Human adaptation and social change
   d. Social change and stress.
   e. Social change and deviance.
   f. Social change and health programme
   g. The role of social planning in the improvement of health and rehabilitation.

9. Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.
   a. Population explosion
   b. Poverty and unemployment
   c. Beggary
   d. Juvenile delinquency
   e. Prostitution
   f. Alcoholism
   g. Problems of women in employment
   h. Geriatric problems
   i. Problems of underprivileged.

10. Social Security:
    a. Social security and social legislation in relation to the disabled.

11. Social worker:
    a. Meaning of Social Work
    b. The role of a Medical Social Worker.
INTRODUCTION TO NATIONAL HEALTHCARE DELIVERY SYSTEM IN INDIA

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

1. Introduction to healthcare delivery system
   a. Healthcare delivery system in India at primary, secondary and tertiary care
   b. Community participation in healthcare delivery system
   c. Health system in developed countries.
   d. Private Sector
   e. National Health Mission
   f. National Health Policy
   g. Issues in Health Care Delivery System in India
2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.
3. Introduction to AYUSH system of medicine
   a. Introduction to Ayurveda.
   b. Yoga and Naturopathy
   c. Unani
   d. Siddha
   e. Homeopathy
   f. Need for integration of various system of medicine
4. Health scenario of India- past, present and future
5. Demography & Vital Statistics-
   a. Demography – its concept
   b. Vital events of life & its impact on demography
   c. Significance and recording of vital statistics
   d. Census & its impact on health policy
6. Epidemiology
   e. Principles of Epidemiology
   f. Natural History of disease
   g. Methods of Epidemiological studies
   h. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

BASIC COMPUTERS AND INFORMATION SCIENCE

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

1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

3. Processor and memory: The Central Processing Unit (CPU), main memory.

4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

5. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

6. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

7. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

8. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

9. Introduction of Operating System: introduction, operating system concepts, types of operating system.


11. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.


**PRACTICAL:** Practical on fundamentals of computers -

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

**ENGLISH, COMMUNICATION AND SOFT SKILLS**

Major topics to be covered under Communication course –

3. Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.
4. Basic concepts & principles of good communication
5. Special characteristics of health communication
6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.
7. Therapeutic communication: empathy versus sympathy.
10. Barriers of communication & how to overcome.
COMMUNITY ORIENTATION AND CLINICAL VISIT

The objective of this particular section of the foundation course is to sensitize potential learners with essential knowledge; this will lay a sound foundation for their learning across the under-graduate program and across their career. Innovative teaching methods should be used to ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bed-side demonstrations.

1. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system - Sub centre, PHC, CHC, SDH, DH and Medical college, private hospitals, dispensaries and clinics.
2. The student will also be briefed regarding governance at village level including interaction and group discussion with village panchayat and front line health workers.
3. Clinical visit to their respective professional department within the hospital.

Second Semester

HUMAN ANATOMY II

Studies are concerned with the topographical and functional anatomy of the limbs and thorax. Particular attention is paid to the muscles, bones and joints of the regions. The head and neck and central nervous system (CNS) are studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.

1. Musculo Skeletal Anatomy - (All the topics to be taught in detail)
   a. Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)
   b. Connective tissue classification.
   c. Bones- Composition & functions, classification and types according to morphology and development.
   d. Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.
   e. Muscles – origin, insertion, nerve supply and actions.
   f. Upper Extremity
      i. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
      ii. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
      iii. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
      iv. Arches of hand, skin of the palm and dorsum of hand.
   g. Lower Extremity
      i. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.
      ii. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the
foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.


h. Trunk & Pelvis:
   i. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.
   ii. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc.
   iii. Pelvic girdle and muscles of the pelvic floor.

i. Head and Neck:
   i. Osteology: Mandible and bones of the skull.
   ii. Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.
   iii. Gross anatomy of eyeball, nose, ears and tongue.

j. Neuro Anatomy - Organization of Central Nervous system - Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system
   i. Cranial nerves
   ii. Peripheral nervous system
   iii. Peripheral nerve
   iv. Neuromuscular junction
   v. Sensory end organs
   vi. Central Nervous System
   vii. Spinal segments and areas
   viii. Brain Stem
   ix. Cerebellum
   x. Inferior colliculi
   xi. Superior Colliculi
   xii. Thalamus
   xiii. Hypothalamus
   xiv. Corpus striatum
   xv. Cerebral hemisphere
   xvi. Lateral ventricles
   xvii. Blood supply to brain
   xviii. Basal Ganglia
   xix. The pyramidal system
   xx. Pons, medulla, extra pyramidal systems
   xxi. Anatomical integration

PRACTICAL - List of Practical / Demonstrations *
1. Upper extremity including surface Anatomy.
2. Lower extremity including surface Anatomy.
3. Head & Spinal cord and Neck and Brain including surface Anatomy.
4. Thorax including surface anatomy, abdominal muscles.
5. Histology-Elementary tissue including surface Anatomy.
PHYSIOLOGY II

1. Special Senses -
   b. Visual Pathway and the effects of lesions.
   c. Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.
   h. Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders

2. Nervous System -
   e. Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.
   h. Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome
   i. Reticular Formation and Limbic System: Components and Functions.
l. EEG: Waves and features. Sleep: REM and NREM sleep.
n. ANS: Features and actions of parasympathetic and sympathetic nervous system.

3. Renal System -
e. Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.
g. Acid-Base balance (very brief)
h. Artificial Kidney: Principle of haemodialysis.
i. Skin and temperature regulation.

4. Reproductive System -

5. Physiology of exercise –
a. Effects of acute and chronic exercise on
   i. O2 transport
   ii. Muscle strength/power/endurance
   iii. B.M.R. /R.Q.
   iv. Hormonal and metabolic effect
   v. Cardiovascular system
   vi. Respiratory system
   vii. Body fluids and electrolyte
b. Effect of gravity / altitude /acceleration / pressure on physical parameters
c. Physiology of Age
APPLIED PHYSIOLOGY -
More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.

1. Pulmonary Functions
   b. Respiratory adjustments in exercises.
   c. Artificial respiration
   d. Breath sounds.

2. Cardiovascular Functions
   a. Blood flow through arteries, arterioles, capillaries, veins and venules.
   b. Circulation of Lymph, Oedema
   c. Factors affecting cardiac output.
   d. Circulatory adjustment in exercise and in postural and gravitational changes,
   e. Pathophysiology of fainting and heart failure.

3. Muscles and Nervous System Functions
   a. Peripheral nervous system, neuromuscular transmission, Types of nerve fibers.
   b. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV
   c. Degeneration and regeneration of nerve, Reactions of denervations.
   d. Synaptic transmission, Stretch reflex - Mechanism and factors affecting it.
   e. Posture, Balance and Equilibrium/Coordination of voluntary movement.
   f. Voluntary motor action, clonus, Rigidity, incoordination.
   g. Special senses- Vision, taste, hearing, vestibular, Olfaction
   h. Sympathetic and Parasympathetic regulation, Thermoregulation.

4. Blood functions
   a. Thalassemia Syndrome, Hemophilia, VWF
   b. Anemia, Leukocytosis
   c. Bone marrow transplant

5. Metabolic Functions
   a. Diabetes Mellitus, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency.

PRACTICAL

1. Clinical Examination
   a. Examination of Radial pulse.
   b. Recording of blood pressure
   c. Examination of CVS
   d. Examination of Respiratory system
   e. Examination of Sensory system
   f. Examination of Motor System
   g. Examination of reflexes
   h. Examination of cranial nerves

a. Normal cardiogram of amphibian heart.
   i. Properties of Cardiac muscle
   ii. Effect of temperature on cardiogram.

3. Recommended Demonstrations
   a. Spirometry
   b. Artificial Respiration
   c. ECG
   d. Perimetry
   e. Mosso’s Ergometry

GENERAL & CLINICAL PSYCHOLOGY

SUBJECT DESCRIPTION -

Human Psychology involves the study of various behavioral patterns of individuals, theories of
development, normal and abnormal aspects of motor, social, emotional and language development,
communication and interaction skills appropriate to various age groups.

The study of these subjects will help the student to understand their clients while assessment and while
planning appropriate treatment methods.

THEORY -

1. Introduction to Psychology
   a. Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
   b. Methods: Introspection, observation, inventory and experimental method.
   c. Branches: pure psychology and applied psychology
   d. Psychology and physiotherapy

2. Growth and Development
   a. Life span: Different stages of development (Infancy, childhood, adolescence, adulthood,
      middle age, old age).
   b. Heredity and environment: role of heredity and environment in physical and
      psychological development, “Nature v/s Nurture controversy”.

3. Sensation, attention and perception
   a. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement,
      equilibrium and visceral sense.
   b. Attention: Types of attention, Determinants of attention (subjective determinants and
      objective determinants).
   c. Perception: Gestalt principles of organization of perception (principle of figure ground
      and principles of grouping), factors influencing perception (past experience and context).
   d. Illusion and hallucination: different types.

4. Motivation
   a. Motivation cycle (need, drive, incentive, reward).
   b. Classification of motives.
   c. Abraham Maslow’s theory of need hierarchy

5. Frustration and conflict
a. Frustration: sources of frustration.
b. Conflict: types of conflict.
c. Management of frustration and conflict

6. Emotions
   a. Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).
   b. Theories of emotion
   c. Stress and management of stress.

7. Intelligence
   a. Theories of intelligence.
   b. Distribution of intelligence.
   c. Assessment of intelligence

8. Thinking
   a. Reasoning: deductive and inductive reasoning
   b. Problem solving: rules in problem solving (algorithm and heuristic)
   c. Creative thinking: steps in creative thinking, traits of creative people

9. Learning
   a. Factors effecting learning.
   b. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.
   c. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

10. Personality
    a. Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach.
    b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

11. Social psychology
    a. Leadership: Different types of leaders. Different theoretical approaches to leadership.


**BASIC PRINCIPLES OF BIOMECHANICS**

Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.
THEORY

1. Basic Concepts in Biomechanics: Kinematics and Kinetics
   a. Types of Motion
   b. Location of Motion
   c. Direction of Motion
   d. Magnitude of Motion
   e. Definition of Forces
   f. Force of Gravity
   g. Reaction forces
   h. Equilibrium
   i. Objects in Motion
   j. Force of friction
   k. Concurrent force systems
   l. Parallel force system
   m. Work
   n. Moment arm of force
   o. Force components
   p. Equilibrium of levers

2. Joint structure and Function -
   a. Joint design
   b. Materials used in human joints
   c. General properties of connective tissues
   d. Human joint design
   e. Joint function
   f. Joint motion
   g. General effects of disease, injury and immobilization.

3. Muscle structure and function -
   a. Mobility and stability functions of muscles
   b. Elements of muscle structure
   c. Muscle function
   d. Effects of immobilization, injury and aging

4. Biomechanics of the Thorax and Chest wall -
   a. General structure and function
   b. Rib cage and the muscles associated with the rib cage
   c. Ventilatory motions: its coordination and integration
   d. Developmental aspects of structure and function
   e. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

5. The Temporomandibular Joint-
   a. General features, structure, function and dysfunction

MEDICAL TERMINOLOGIES AND RECORD KEEPING

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

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.
4. Basic medical terms in health care and physiotherapy.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.
7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
8. Interpret medical records/reports.

**Third Semester**

**PATHOLOGY**

**SUBJECT DESCRIPTION:** This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of Microbiology & Pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.

**THEORY – General Pathology**

1. Introduction to Pathology
2. Cell injuries –
   a. Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure. Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes. Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations,
   b. Pigments - Melanin / Hemosiderin.
   c. Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains.
3. Inflammation and Repair –
   a. Acute inflammation: features, causes, vascular and cellular events.
   b. Inflammatory cells and Mediators. Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.
   c. Repair, Wound healing by primary and secondary union, factors promoting and delaying the process.
   d. Healing in specific site including bone healing.
4. Immunopathology –
a. Immune system: General concepts.
b. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concepts and classification, SLE.
c. AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education.

5. Infectious diseases –
a. Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.
b. Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery.
c. Viral diseases: Poliomyelitis, Herpes, Rabies, Measles, Ricktsia, Chlamydial infection, HIV infection.
d. Fungal disease and opportunistic infections.
e. Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

6. Circulatory Disturbances –
b. Infarction: Types, Common sites.
c. Shock: Pathogenesis, types, morphologic changes.

7. Growth Disturbances and Neoplasia
a. Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis, dysplasia.
b. Precancerous lesions.
c. Neoplasia: Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma.
d. Malignant Neoplasia: Grades and Stages, Local & Distant spread.

8. Nutritional Disorders –
a. Protein energy malnutrition: Marasmus, Kwashiorkor, and Vitamin deficiency disorders, classification with specific examples.

9. Genetic Disorders –
a. Basic concepts of genetic disorders and some common examples and congenital malformation.

THEORY – Systemic pathology

10. Hematology –
a. Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis.

c. Acquired hemolytic anaemias
   i. Alloimmune, Autoimmune
   ii. Drug induced, Microangiopathic Pancytopenia - Aplastic anemia.

d. Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies –
   i. Inherited
   ii. Acquired with lab diagnosis.

e. Leukocytic disorders: Leukocytosis, Leukopenia, Leukemoid reaction.

f. Leukemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and disproteinemias.

g. Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis, Blood-components & plasma-pheresis.

11. Respiratory System
   a. Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

12. Cardiovascular Pathology
   b. Endocarditis. Rheumatic Heart disease.
   d. Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.

13. Alimentary tract:
   b. Stomach: Gastritis, Ulcer & Tumours.
   c. Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma.

   b. Alcoholic liver disease
   c. Cirrhosis: Postnecrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver

15. Lymphatic System
Hyperplasia, Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas, Metastatic Tumours.
b. Causes of Splenic Enlargements.
16. Musculoskeletal System
   a. Osteomyelitis, acute, chronic, tuberculous, mycetoma
17. Endocrine pathology
   a. Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis.
18. Neuropathology
   a. Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess
   b. Tuberculosis, Cysticercosis
   c. CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma
19. Dermatopathology
   a. Skin tumors: Squamos cell carcinoma, Basal cell carcinoma, Melanoma

PRACTICAL
Demonstration of Slides – The students may be demonstrated the common histopathological, hematological and cytological slides and specimens and charts and their interpretations.

MICROBIOLOGY

THEORY

1. General Microbiology -
   c. Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.
   d. Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated.
   e. Physiology: Essentials of bacterial growth requirements.
   g. Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.
2. Immunology -
a. Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.
b. Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Immunology of hypersensitivity, Measuring immune functions.

3. Bacteriology -
a. To be considered under the following headings
b. Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports.
c. Staphylococci, Streptococci and Pneumococci.
d. Mycobacteria: Tuberculosis, M.leprae, atypical mycobacteria, Enterobacteriaceae,
e. Vibrios: V. cholerae and other medically important vibrios, Campylobacters and Helicobacters, Pseudomonas.
f. Bacillus anthracis, Sporing and non-sporing anaerobes: Clostridia, Bacteroides and Fusobacteria.

4. General Virology -

5. Mycology -

6. Clinical/Applied Microbiology -
a. Streptococcal infections: Rheumatic fever and Rheumatic heart disease, Meningitis.
b. Tuberculosis,
c. Pyrexia of unknown origin, leprosy,
d. Sexually transmitted diseases, Poliomyelitis,
e. Hepatitis,
f. Acute-respiratory infections, Central nervous System infections, Urinary tract infections,
g. Pelvic inflammatory disease, Wound infection, Opportunistic infections, HIV infection,
h. Malaria, Filariasis, Zoonotic diseases.

PRACTICAL
1. Demonstration of Microscopes and its uses
2. Principles, uses and demonstration of common sterilization equipment
3. Demonstration of common culture media
4. Demonstration of motility by hanging drops method
5. Demonstration of Gram Stain, ZN Stain
6. Demonstration of Serological test: ELISA
7. Demonstration of Fungus
PHARMACOLOGY –

SUBJECT DESCRIPTION - This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

1. General Pharmacology –
   a. Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.
2. Autonomic Nervous system –
   a. General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
   b. Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.
3. Cardiovascular Pharmacology –
   a. Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
   b. Antiarrhythmic Drugs
   c. Drugs used in the treatment of vascular disease and tissue ischemia : Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.
4. Neuropharmacology –
   a. Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
   b. Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
   c. Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
   d. Antipsychotic drugs
5. Disorders of Movement -
   a. Drugs used in Treatment of Parkinson ‘s disease
   b. Antiepileptic Drugs
   c. Spasticity and Skeletal Muscle Relaxants
6. Inflammatory/Immune Diseases -
   a. Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interactins with NSAIDs
   b. Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
   c. Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
d. Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematosus, Scleroderma, Demyelinating Disease

e. Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

7. Digestion and Metabolism -
   a. Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

8. Geriatrics -

**BIOMECHANICS AND KINESIOLOGY** -

1. Biomechanics of the vertebral column -
   a. General structure and function
   b. Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region
   c. Muscles of the vertebral column
   d. General effects of injury and aging

2. Biomechanics of the peripheral joints -
   a. The shoulder complex: Structure and components of the shoulder complex and their integrated function
   b. The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
   c. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand.
   d. The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur:
   e. The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
   f. The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

3. Analysis of Posture and Gait – Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation; general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait;Movement Analysis : ADL activities like sitting – to standing, lifting, various grips , pinches.
PRACTICAL- shall be conducted for various joint movements and analysis of the same. Demonstration may also be given as how to analyze posture and gait. The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

FOUNDATION OF EXERCISE THERAPY AND THERAPEUTIC MASSAGE

EXERCISE THERAPY

SUBJECT DESCRIPTION - In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

THEORY

1. Introduction to Exercise Therapy - The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient’s problems, Assessment of patient’s condition – Measurements of Vital parameters, Starting Positions – Fundamental positions & derived Positions, Planning of Treatment
2. Methods of Testing
   a. Functional tests
   b. Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints
   c. Tests for neuromuscular efficiency
      i. Electrical tests
      iii. Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf
      iv. Static power Test
      v. Dynamic power Test
      vi. Endurance test
      vii. Speed test
d. Tests for Co-ordination
e. Tests for sensation
f. Pulmonary Function tests
g. Measurement of Limb Length: true limb length, apparent limb length, segmental limb length
h. Measurement of the angle of Pelvic Inclination
3. Relaxation
   a. Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on
the body mechanism, Indications of relaxation, Methods & techniques of relaxation-
Principles & uses: General, Local, Jacobson’s, Mitchel’s, additional methods.

4. Passive Movements
   a. Causes of immobility, Classification of Passive movements, Specific definitions related to
      passive movements, Principles of giving passive movements, Indications,
      contraindications, effects of uses, Techniques of giving passive movements.

5. Active Movements
   a. Definition of strength, power & work, endurance, muscle actions.
   b. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical
      events during contraction & relaxation, muscle fiber type, motor unit, force gradation.
   c. Causes of decreased muscle performance
   d. Physiologic adaptation to training: Strength & Power, Endurance.
   e. Types of active movements

6. Free exercise: Classification, principles, techniques, indications, contraindications, effects
   and uses

7. Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses
   Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses
   Resisted Exercise: Definition, principles, indications, contraindications, precautions &
   techniques, effects and uses

8. Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise,
   Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable
   resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.

THERAPEUTIC MASSAGE

SUBJECT DESCRIPTION- The students will be able to understand the concepts, different types
and application of massage on patients during clinical practice.

THEORY

1. History and Classification of Massage Technique
2. Principles, Indications and Contraindications
3. Technique of Massage Manipulations
4. Physiological and Therapeutic Uses of Specific Manipulations

PRACTICAL

1. Different test methods
2. Demonstrate relaxation techniques.
3. Demonstrate to apply the technique of passive movements
4. Demonstrate various techniques of Active movements
5. Demonstrate massage technique application according to body parts.
INTRODUCTION TO QUALITY AND PATIENT SAFETY

1. Quality assurance and management - The objective of the course is to help students understand the basic concepts of quality in health care and develop skills to implement sustainable quality assurance program in the health system.
   a. Concepts of Quality of Care
   b. Quality Improvement Approaches
   c. Standards and Norms
   d. Quality Improvement Tools
   e. Introduction to NABH guidelines

2. Basics of emergency care and life support skills - Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the subject are as follows:
   a. Vital signs and primary assessment
   b. Basic emergency care – first aid and triage
   c. Ventilations including use of bag-valve-masks (BVMs)
   d. Choking, rescue breathing methods
   e. One- and Two-rescuer CPR
   f. Using an AED (Automated external defibrillator).
   g. Managing an emergency including moving a patient

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

3. Bio medical waste management and environment safety - The aim of this section will be to help prevent harm to workers, property, the environment and the general public. Topics to be covered under the subject are as follows:
   a. Definition of Biomedical Waste
   b. Waste minimization
   c. BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
   d. Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
   e. BMW Management & methods of disinfection
   f. Modern technology for handling BMW
   g. Use of Personal protective equipment (PPE)
   h. Monitoring & controlling of cross infection (Protective devices)

4. Infection prevention and control - The objective of this section will be to provide a broad understanding of the core subject areas of infection prevention and control and to equip AHPs
with the fundamental skills required to reduce the incidence of hospital acquired infections and improve health outcomes. Concepts taught should include –
   a. Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)],
   b. Prevention & control of common healthcare associated infections,
   c. Components of an effective infection control program, and
   d. Guidelines (NABH and JCI) for Hospital Infection Control

5. Antibiotic Resistance-
   a. History of Antibiotics
   b. How Resistance Happens and Spreads
   c. Types of resistance- Intrinsic, Acquired, Passive
   d. Trends in Drug Resistance
   e. Actions to Fight Resistance
   f. Bacterial persistence
   g. Antibiotic sensitivity
   h. Consequences of antibiotic resistance
   i. Antimicrobial Stewardship- Barriers and opportunities, Tools and models in hospitals

6. Disaster preparedness and management- The objective of this section will be to provide knowledge on the principles of on-site disaster management. Concepts to be taught should include-
   a. Fundamentals of emergency management,
   b. Psychological impact management,
   c. Resource management,
   d. Preparedness and risk reduction,
   e. Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

Fourth Semester

EXERCISE THERAPY

SUBJECT DESCRIPTION- After the course on exercise therapy student will be able to understand the different types of exercise for the benefit of patient in different situations and conditions both in health and disease or disorder.

1. Specific exercise regimens
   a. Isotonic: de Lormes, Oxford, MacQueen, Circuit weight training
   b. Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle
   c. Isometrics Isokinetic regimens

2. Proprioceptive Neuromuscular Facilitation
   a. Definitions & goals
   b. Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb
c. Procedure: components of PNF
d. Techniques of facilitation
e. Mobility: Contract relax, Hold relax, Rhythmic initiation
f. Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization
Stability: Alternating isometric, rhythmic stabilization
g. Skill: timing for emphasis, resisted progression
Endurance: slow reversals, agonist reversal

3. Suspension Therapy
   a. Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy
   b. Types of suspension therapy: axial, vertical, pendular

Techniques of suspension therapy for upper limb
Techniques of suspension therapy for lower limb

4. Functional Re-education
   a. Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upper limb activities.

5. Aerobic Exercise
   a. Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.

6. Stretching
   a. Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.

7. Manual Therapy & Peripheral Joint Mobilization
   b. Biomechanical basis for mobilization, Effects of joint mobilisation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

8. Balance - Definition
   a. Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output
   b. Components of balance (sensory, musculoskeletal, biomechanical)

9. Co-ordination Exercise
   a. Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco-ordination
   b. Causes for Inco-ordination, Test for co-ordination: equilibrium test, non-equilibrium test

Principles of co-ordination exercise.
c. Frenkel’s Exercise: uses of Frenkel’s exercise, technique of Frenkel’s exercise, progression, home exercise.

10. Posture
   a. Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education.

11. Walking Aids
   a. Types: Crutches, Canes, Frames; Principles and training with walking aids

12. Basics in Manual Therapy & Applications with Clinical reasoning
   a. Examination of joint integrity
      i. Contractile tissues
      ii. Non contractile tissues
   b. Mobility - assessment of accessory movement & End feel
   c. Assessment of articular & extra-articular soft tissue status
      i. Myofascial assessment
      ii. Acute & Chronic muscle hold
      iii. Tightness
      iv. Pain-original & referred
   d. Basic principles, Indications & Contra-Indications of mobilization skills for joints & soft tissues.
      i. Maitland
      ii. Mulligan
      iii. McKenzie
      iv. Muscle Energy Technique
      v. Myofascial stretching
      vi. Cyriax
      vii. Neuro Dynamic Testing

13. Hydrotherapy
   a. Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipment, techniques, Effects and uses, merits and demerits

14. Individual and Group Exercises
   a. Advantages and Disadvantages, Organization of Group exercises, Recreational Activities and Sports

15. Introduction to Yoga
   a. Asanas – Principles and elements;
   b. Pranayamas – Principles, Methods and Techniques

**PRACTICAL**
The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to

1. Demonstrate the technique of measuring using goniometry
2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate the techniques for muscle strengthening based on MMT grading
4. Demonstrate the PNF techniques
5. Demonstrate exercises for training co-ordination – Frenkel’s exercise
6. Demonstrate the techniques of massage manipulations
7. Demonstrate techniques for functional re-education
8. Assess and train for using walking aids
9. Demonstrate mobilization of individual joint regions
10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
11. Demonstrate the techniques for muscle stretching
12. Assess and evaluate posture and gait
13. Demonstrate techniques of strengthening muscles using resisted exercises
14. Demonstrate techniques for measuring limb length and body circumference.

BIO-PHYSICS

SUBJECT DESCRIPTION - To understand the concept and basic principles to know electrotherapy equipments is given under this topic. The student will be taught about physics related to electrotherapy and application on human body tissues.

1. Physical principles
   b. Structure of atom, molecules, elements and compound
   c. Electricity: Definition and types. Therapeutic uses. Basic physics of construction. Working
   d. Importance of currents in treatment.
   e. Static Electricity: Production of electric charge. Characteristic of a charged body.
   f. Characteristics of lines of forces. Potential energy and factors on which it depends. Potential difference and EMF.
   g. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt
   h. Condensers: Definition, principle, Types- construction and working, capacity & uses.
   j. Conductors, Insulators, Potential difference, Resistance and intensity
   k. Ohm's law and its application to DC and AC currents. Fuse: construction, working and application.
   l. Transmission of electrical energy through solids, liquids, gases and vacuum.
   m. Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits.
   n. Display devices and indicators-analogue and digital.
   o. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses
   p. Chokes: Principle, Construction and working, Uses

2. Effects of Current Electricity
   a. Chemical effects-Ions and electrolytes, Ionisation, Production of an EMF by chemical actions.
   b. Ionization: Principles, effects of various technique of medical ionization.
   c. Electromagnetic Induction.
3. Electrical Supply  
   a. Brief outline of main supply of electric current  
   b. Dangers: short circuit, electric shocks: Micro/Macro shocks  
   c. Precaution: safety devices, earthing, fuses etc.  
   d. First aid and initial management of electric shock  
   e. Burns: electrical & chemical burns, prevention and management  

4. Various agents  
   b. Ultrasound: Physical Principles of Sound  
   c. Electromagnetic Radiation: Physical Principles and their Relevance to Physiotherapy Practice  
   d. Electric Currents: Physical Principles and their Relevance to Physiotherapy Practice.  

5. Section II – Therapeutic Electricity  

ELECTROTHERAPY  

SUBJECT DESCRIPTION - In this course the student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function. The objective of this course is that after 240hrs of lectures, demonstration, practical and clinics the student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions.  

THEORY  

Section II A - Low frequency Currents  

1. Basic types of current  
   a. Direct Current: types, physiological & therapeutic effects.  
   b. Alternating Current  

2. Types of Current used in Therapeutics  
   a. Modified D.C  
      i. Faradic Current  
      ii. Galvanic Current  
   b. Modified A.C  
      i. Sinusoidal Current  
      ii. Diadynamic Current.  


5. Sinusoidal Current & Diadynamic Current in Brief.  

6. HVPGS – Parameters & its uses
7. Ionization / Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, hyperhydrosis, wound healing.

8. Cathodal / Anodal galvanism.

9. Micro Current & Macro Current

10. Types of Electrical Stimulators
    a. NMES- Construction component.
    b. Neuro muscular diagnostic stimulator- construction component.
    c. Components and working Principles


13. TENS: Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

14. Pain: Define Pain, Theories of Pain (Outline only), Pain Gate Control theory in detail. [2 Hours]

Section II B - Electro-diagnosis
1. FG Test
2. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle, Chronaxie & Rheobase.
3. Nerve conduction velocity studies
4. EMG: Construction of EMG equipment.

Section II C - Medium Frequency
1. Interferential Therapy: Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications.
2. Russian Current
3. Rebox type Current

Section III - Thermo & Actinotherapy (High Frequency Currents)
1. Electro Magnetic Spectrum.
2. SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.
4. Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD. [2 Hours]


6. IRR: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. [2 Hours]


8. LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density [8 Hours]

Section IV – Superficial heating Modalities

1. Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.

2. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.


5. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.


PRACTICAL
The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.
1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Demonstrate placement of electrodes for various electrotherapy modalities
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase
7. Demonstrate FG test
8. Application of Ultrasound for different regions-various methods of application
9. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy
10. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose
11. Demonstrate treatment method using IFT for various regions
12. Calculation of dosage and technique of application of LASER
13. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy
14. Demonstrate the treatment method using whirl pool bath
15. Winding up procedure after any electrotherapy treatment method.

**Equipment care -**

1. Checking of equipments
2. Arrangement of exercise therapy and electro therapy equipment.
3. Calibration of equipment
4. Purchase, billing, document of equipment.
5. Safety handling of equipments.
6. Research lab equipment maintenance.
7. Stock register, movement register maintenance

**MEDICAL/ PHYSIOTHERAPY LAW AND ETHICS**

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

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

1. Medical ethics versus medical law - Definition - Goal - Scope
2. Introduction to Code of conduct
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational drug therapy
5. Autonomy and informed consent - Right of patients
6. Care of the terminally ill- Euthanasia
7. Organ transplantation
8. Medical diagnosis versus physiotherapy diagnosis.
10. Professional Indemnity insurance policy
11. Development of standardized protocol to avoid near miss or sentinel events
12. Obtaining an informed consent.
13. Biomedical ethical principles
14. Code of ethics for physiotherapists
15. Ethics documents for physiotherapists
16. Laws affecting physiotherapy practice

**Fifth Semester**

**CLINICAL ORTHOPEDICS & TRAUMATOLOGY -**

**SUBJECT DESCRIPTION** - This subject follows the basic science subjects to provide the knowledge about Orthopedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

1. Introduction
   a. Introduction to orthopaedics.
   b. Clinical examination in an Orthopedic patient.
   c. Common investigative procedures.
   d. Radiological and Imaging techniques in Orthopedics.
   e. Inflammation and repair, Soft tissue healing.

2. Traumatology
   a. Fracture: definition, types, signs and symptoms.
   b. Fracture healing.
   c. Complications of fractures.
   d. Conservative and surgical approaches.
   e. Principles of management – reduction (open/closed, immobilization etc).
   f. Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).

3. Fractures and Dislocations of Upper Limb
   a. Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
i. Fractures of clavicle and scapula.
ii. Fractures of greater tuberosity and neck of humerus.
iii. Fracture shaft of humerus.
iv. Supracondylar fracture of humerus.
v. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.
vi. Side swipe injury of elbow.

vii. Both bone fractures of ulna and radius.
ix. Chauffer’s fracture.
x. Colle’s fracture.
xi. Smith’s fracture.
xii. Scaphoid fracture.
xiii. Fracture of the metacarpals.
xiv. Bennett’s fracture.
xv. Fracture of the phalanges. (Proximal and middle.)

b. Dislocations of Upper Limb –

i. Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher’s and Hippocrates maneuver), surgical management (putti plat, bankart’s) etc.

ii. Recurrent dislocation of shoulder.

iii. Posterior dislocation of shoulder – mechanism of injury, clinical features and management.


4. Fracture of Spine

a. Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management- immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia).

i. Clay shoveller’s fracture.

ii. Hangman’s fracture.

iii. Fracture odontoid.

iv. Fracture of atlas.

b. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management— conservaive and surgical of common fractures around thoracic and lumbar regions.

c. Fracture of coccyx.


5. Fractures and Dislocations of Lower Limb

a. Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:

i. Fracture of pelvis.

ii. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
iii. Fractures of trochanters.
iv. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.
v. Supracondylar fracture of femur.
vi. Fractures of the condyles of femur.
vii. Fracture patella.
viii. Fractures of tibial condyles.
ix. Both bones fracture of tibia and fibula.
x. Dupuytren’s fracture
xi. Maisonneuve’s fracture.

xii. Pott’s fracture – mechanism of injury, management.
xiii. Bimalleolar fracture
xiv. Trimalleolar fracture
xv. Fracture calcaneum – mechanism of injury, complications and management.
xvi. Fracture of talus.
xvii. Fracture of metatarsals—stress fractures jone’s fracture.
xviii. Fracture of phalanges.

b. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.
i. Anterior dislocation of hip.
ii. Posterior dislocation of hip.
iii. Central dislocation of hip.
iv. Dislocation of patella.
v. Recurrent dislocation of patella.

6. Soft Tissue Injuries - Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis.

   a. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:
      i. Meniscal injuries of knee.
      ii. Cruciate injuries of knee.
      iii. Medial and lateral collateral injuries of knee.
      iv. Lateral ligament of ankle.
      v. Wrist sprains.
      vi. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
      vii. Contusions- quadriceps, gluteal, calf, deltoid etc.
      viii. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

7. Hand Injuries - mechanism of injury, clinical features, and management of the following –
   a. Crush injuries.
   b. Flexor and extensor injuries.
   c. Burn injuries of hand.

8. Amputations - Definition, levels of amputation of both lower and upper limbs, indications, complications.

10. Deformities - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.
   
a. Congenital Deformities –
   
i. CTEV.
   
ii. CDH.
   
iii. Torticollis.
   
iv. Scoliosis.
   
v. Flat foot.
   
vi. Vertical talus.
   
   
   
ix. Osteogenesis imperfecta (fragile ossium).
   
ix. Cervical rib.

b. Acquired Deformities –
   
i. Acquired Torticollis.
   
ii. Scoliosis.
   
iii. Kyphosis.
   
iv. Lordosis.
   
v. Genu varum.
   
vi. Genu valgum.
   
vii. Genu recurvatum
   
ix. Coxa vara.
   
ix. Pes cavus.
   
x. Hallux rigidus.
   
xi. Hallux valgus.
   
ixi. Hammer toe.
   
ixii. Metatarsalgia.

11. Disease of Bones and Joints: Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:
   
a. Infective conditions: Osteomyelitis (Acute / chronic). Brodie’s abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.
   
   
   
d. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.
   

12. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
   
   
b. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)
13. Syndromes: Causes, Clinical features, complications, management- conservative and surgical of the following:
14. Neuromuscular Disorders: Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:
   a. Cerebral palsy.
   b. Poliomyelitis.
   c. Spinal Dysraphism.
   d. Leprosy.
15. Cervical and Lumbar Pathology: Causes, clinical feature, patho-physiology, investigations, management-Medical and surgical for the following:
   a. Prolapsed interverbral disc (PID),
   b. Spinal Canal Stenosis.
   c. Spondylosis (cervical and lumbar)
   d. Spondylolysis.
   e. Spondylolisthesis.
   f. Lumbago/ Lumbosacral strain.
   g. Sacralisation.
   h. Lumbarisation.
   i. Coccydynia.
   j. Hemivertebra.
16. Orthopedic Surgeries: Indications, Classification, Types, Principles of management of the following surgeries:
   a. Arthrodesis.
   b. Arthroplasty (partial and total replacement).
   c. Osteotomy,
   d. External fixators.
   e. Spinal stabilization surgeries (Harrington’s, Luque’s, Steffi plating) etc ,
   f. Limb re attachments.
17. Regional Conditions: Definition, Clinical features and management of the following regional conditions
GENERAL SURGERY INCLUDING BURNS, PLASTIC SURGERY AND OBSTETRICS AND GYNECOLOGY

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about relevant aspects of general surgery. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions.

GENERAL SURGERY INCLUDING BURNS AND PLASTIC SURGERY


2. Reasons for Surgery; Types of anaesthesia and its affects on the patient; Types of Incisions; Clips Ligatures and Sutures; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery.

3. Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pneumothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions.


5. Disorders of the Chest Wall, Lung and Mediastinum


9. Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft; Flaps – Types and uses of Flaps.

10. ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.

11. Ophthalmology: Ophthalmologic surgical conditions, refraction’s, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles-surgical management.

**OBSTETRICS AND GYNECOLOGY**

At the end of the course the candidate will be able to:

1. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post – natal stage and menopause.
2. Discuss the various complications during pregnancy, labour, puerperium and post – natal stage, pre and post-menopausal stage and various aspects of urogenital dysfunction and their management in brief.
3. Acquire the skill of clinical examination of pelvic floor
4. Acquire the skill of clinical examination of pregnant woman.

**THEORY**

1. Anatomy and physiology of the female reproductive organs. Puberty dynamics
2. Physiology of menstrual cycle –
   a. ovulation cycle,
   b. uterine cycle,
   c. Cx cycle,
   d. duration,
   e. amount
   f. Hormonal regulation of menstruation,
3. Hormonal disorders of females-obesity and female hormones
4. Pregnancy
   a. Diagnosis of pregnancy
   b. Abortion
   c. Physiological changes during pregnancy
   d. Importance of antenatal care exercise
   e. High risk pregnancy, prenatal common complications – investigation and management
   f. Musculoskeletal disorders during pregnancy
   g. Multiple child birth
   h. Normal labor
5. Child birth complications, investigation and management
6. Normal puerperium, lactation and importance of post-natal exercises
7. Family planning.
8. Medical termination of pregnancy
9. Infection of female genital tract including sexually transmitted diseases, low backache
10. Prolapse of uterus and vagina
11. Principle of common gynaecological operations – hysterectomy, D&C, D&E, Pop smear
12. Menopause: Its effect on emotions and musculoskeletal system
13. Urogenital dysfunction – pre and post-natal condition
15. Surgical procedures involving child birth.
   a. Definition, Indications and Management of the following surgical procedures – pelvic repair, caesarian section, nephrectomy, Hysterosalpingography, Dilatation and Curettage, Laproscopy, Colposcopy, Hysterectomy.
17. Incontinence – Types, Causes, Assessment and Management.

GENERAL MEDICINE INCLUDING PAEDIATRICS AND PSYCHIATRY

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions.

6. Diseases of the digestive system : Clinical manifestations of gastrointestinal disease – Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract ; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the following conditions : Viral Hepatitis, Wilson’s Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholecystitis.
7. Diseases of the Skin: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.


Etio-pathogenesis, manifestations, and management of psychiatric illness
a. Drug dependence and alcoholism,
b. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue,
c. Personality disorders
d. Child psychiatry - manifestations, and management of childhood disorders -attention deficit syndrome and behavioral disorders.
e. Geriatric psychiatry.

COMMUNITY MEDICINE

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about conditions the therapist would encounter in their practice in the community. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to demonstrate an understanding of various aspects of health and disease list the methods of health administration, health education and disease preventive measures.


2. Epidemiology, definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening.

3. Epidemiology of communicable disease: Respiratory infections, Intestinal infections, Arthropod-borne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardio vascular diseases:
Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, Obesity, Blindness, Accidents and Injuries.

4. Public health administration - an overview of the health administration set up at Central and state levels. The national health programme-highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups - pregnant and lactating women, infants and pre-school children, occupational groups.


6. Demography and Family Planning: Demographic cycle, Fertility, Family planning-objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods.


9. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.


11. Disaster Management: Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.


13. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation.


**EVALUATION METHODS AND OUTCOME MEASURES**

Implement methods to assess individual and collective outcomes of patients/clients with disorders of the musculoskeletal, neuromuscular, cardiovascular-pulmonary and integumentary systems using valid
and reliable measures that take into account the setting in which patients/clients receive services, the variables of cultural competence, and the effect of societal factors.

**DIAGNOSTIC IMAGING FOR PHYSIOTHERAPIST**

**SUBJECT DESCRIPTION** - This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

1. **IMAGE INTERPRETATION**
   a. History
   b. A New Kind of Ray
   c. How a Medical Image Helps
   d. What Imaging Studies Reveal
   e. Radiography (x-rays)
   f. Fluoroscopy
   g. Computed Tomography (CT)
   h. Magnetic Resonance Imaging (MRI)
   i. Ultrasound
   j. Endoscopy.

2. **RADIOGRAPHY AND MAMMOGRAPHY**
   a. Equipment components
   b. Procedures for Radiography & Mammography
   c. Benefits versus Risks and Costs
   d. Indications and contraindications.

3. **FLUOROSCOPY**
   a. What is Fluoroscopy?
   b. Equipment used for fluoroscopy
   c. Indications and Contra indications
   d. How it helps in diagnosis
   e. The Findings in Fluoroscopy

4. **COMPUTED TOMOGRAPHY (CT)**
   a. What is Computed Tomography?
   b. Equipment used for Computed Tomography
   c. Indications and Contra indications
   d. How it helps in diagnosis
   e. The Findings in Computed Tomography

5. **MAGNETIC RESONANCE IMAGING (MRI)**
   a. What is MRI?
   b. Equipment used for MRI
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in MRI
f. Benefits versus Risks and Costs
g. Functional MRI.

6. ULTRASOUND
a. What is Ultrasound?
b. Equipment used for Ultrasound
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in Ultrasound

7. ENDOSCOPY
a. What is Endoscopy?
b. Equipment used for Endoscopy
c. Indications and Contra indications
d. How it helps in diagnosis
e. The Findings in Endoscopy

8. NUCLEAR MEDICINE
a. What is Nuclear Medicine?
b. Equipment used for Nuclear Medicine
c. Indications and Contra indications
d. How it helps in diagnosis.
e. Benefits versus Risks and Costs.

Sixth Semester

PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS

SUBJECT DESCRIPTION - The subject serves to integrate the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

1. PT assessment for Orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental , girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination-
dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up.


4. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions.

5. Principles of various schools of thought in manual therapy. (Briefly Maitland and McKenzie).

6. Degenerative and inflammatory conditions: Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritis shoulder.


8. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program.


11. Poliomyelitis: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program.

12. Leprosy: Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively.

13. Amputations: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.
14. Spinal conditions: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliaic joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.

15. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.


17. Orthopedic surgeries: Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.


19. Elbow and forearm: Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.


23. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management.

24. Introduction to Bio-Engineering; Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; Psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications; Designing and construction of adaptive devises.


PRACTICAL - Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

PHYSIOTHERAPY IN GENERAL MEDICINE & GENERAL SURGERY

SUBJECT DESCRIPTION - At the end of the course the candidate will be able to:

1. Identify discuss and analyze cardiovascular and pulmonary dysfunctions based on pathophysiological principles and arrive at appropriate functional diagnosis.
2. Acquire knowledge of rationally of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries (special emphasis on abdominal surgeries)
3. Execute effective physiotherapeutic measures (with appropriate clinical reasoning) and exercise, conditioning in general medical and surgical conditions.
5. Select strategies for cure, care and prevention, adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work and in community.
6. Acquire the knowledge of evaluation and physiotherapeutic treatment for obstetric and gynecological conditions.
7. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology, geriatric and ENT conditions)
8. Evaluate, grade and treat non healing wounds.

THEORY

1. Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy)
2. Geriatrics – handling of old patients and their problems.
3. Complication common to all operations
4. Abdominal incisions.
5. Physiotherapy in pre and post-operative stages.
6. Operations on upper G.I.T.- oesophagus, stomach, duodenum
7. Operations on large and small intestine – Appendicectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.
8. Physiotherapy in dentistry
11. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases.
12. Physiotherapy in dermatology -Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Massage maneuvers for cosmetic
purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot; Evaluation, planning and management of leprosy-prescription, fitting and training with prosthetic and orthotic devices.

13. ENT – sinusitis, non-suppurative and chronic suppurative otitis media, osteosclerosis, labyrinthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeal – laryngectomy, facial palsy.

CLINICAL NEUROLOGY & NEUROSURGERY

SUBJECT DESCRIPTION-This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & neurosurgery. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various neurological conditions.

2. Classification of neurological involvement depending on level of lesion.
3. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.
4. Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures- skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.
6. Deafness, vertigo, and imbalance: Physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.
7. Lower cranial nerve paralysis – Etiology, clinical features, investigations, and management of following disorders - lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell’s palsy, hemi facial spasm, Glossopharanjal neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve. Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia.


14. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.


17. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications.

18. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.


20. Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic


PROFESSIONALISM AND VALUES

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

1. Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality. Core values- Accountability, Altruism, Compassion/ caring, excellence, integrity, professional duties, social responsibility.
2. Personal values- ethical or moral values
3. Attitude and behavior- professional behavior, treating people equally
4. Code of conduct , professional accountability and responsibility, misconduct
5. Differences between professions and importance of team efforts
6. Cultural issues in the healthcare environment
7. Entry level health care practitioner, direct access, autonomy in profession, practitioner of practice and evidence based practice.
The five roles of the Physiotherapist -

1. The Physiotherapist as Patient/Client manager
   a. Evaluation and diagnosis
   b. Diagnosis as clinical decision making
   c. Prognosis
   d. Discharge planning and discontinuance of care
   e. Discontinuance of care
   f. Outcomes
   g. Clinical decision making
   h. Referral relationships
   i. Interpersonal relationships
   j. Ethical and legal issues
   k. Informed consent
   l. Managed care and fidelity.

2. The Physiotherapist as Consultant
   a. Physiotherapy consultation
   b. Building a consulting business
   c. The consulting process
   d. The skills of a good consultant
   e. Trust in the consultant/client relationship
   f. Ethical and legal issues in consultation
   g. Components of a consulting agreement.

3. The Physiotherapist as Critical Inquirer
   a. History of critical inquiry
   b. Evidence-based practice
   c. Outcomes research
   d. Whose responsibility is research?
   e. Roles of the staff physiotherapist in critical inquiry
   f. Collaboration in clinical research
   g. Ethical and legal issues in critical inquiry.

4. The Physiotherapist as Administrator
   a. History of physiotherapy administration
   b. Contemporary physiotherapy administration
   c. Patient/client management
   d. First-line management
   e. Midlevel managers and chief executive officers
   f. Leadership
   g. Ethical and legal issues.

5. The Physiotherapist as Educator
   a. History of physiotherapy education
b. Contemporary educational roles of the physiotherapist

c. Teaching opportunities in continuing education

d. Academic teaching opportunities

e. Theories of teaching and learning in professional education

f. Ethical and legal issues in physiotherapy education.

Seventh Semester

PHYSIOTHERAPY IN NEUROLOGY & PSYCHOSOMATIC DISORDER

SUBJECT DESCRIPTION - The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.


8. Pre and post-surgical assessment and treatment following conditions - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson’s disease, Chorea, Hemiballism, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.


PRACTICAL: Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.
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.

**RESEARCH METHODOLOGY**

1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.
3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design.
4. Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design.
7. Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions.
8. Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.
9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis.

**BIOSTATISTICS**

1. Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.
2. Tabulation of Data: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.
3. Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.
4. Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skewness, kurtosis.

5. Sampling techniques: Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.


7. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).

HEALTH PROMOTION, FITNESS AND WELLNESS

SUBJECT DESCRIPTION - This course includes discussion on the theories of health and wellness, including motivational theory, locus of control, public health initiative, and psycho-social, spiritual and cultural consideration. Health risks, screening, and assessment considering epidemiological principles are emphasized. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered.

1. Prevention practice: a holistic perspective for physiotherapy
   a. Defining Health
   b. Predictions of Health Care
   c. Comparing Holistic Medicine and Conventional Medicine
   d. Distinguishing Three Types of Prevention Practice.

2. Healthy People
   a. Definition of healthy people
   b. Health education Resources
   c. Physiotherapist role for a healthy community.

3. Key concepts of fitness
   a. Defining & Measuring Fitness
   b. Assessment of Stress with a Survey
   c. Visualizing Fitness
   d. Screening for Mental and Physical Fitness
   e. Body Mass Index calculations.

4. Fitness training
   a. Physical Activities Readiness Questionnaire
   b. Physical Activities Pyramid
   c. Exercise Programs
   d. Evidence-Based Practice.

5. Health, fitness, and wellness issues during childhood and adolescence

6. Health, fitness, and wellness during adulthood

7. Women’s health issues: focus on pregnancy:

8. Prevention practice for older adults

9. Resources to optimize health and wellness

11. Prevention practice for musculoskeletal conditions
12. Prevention practice for cardiopulmonary conditions
13. Prevention practice for neuromuscular conditions
14. Prevention practice for integumentary disorders
15. Prevention practice for individuals with developmental disabilities

CLINICAL CARDIOVASCULAR AND PULMONARY

SUBJECT DESCRIPTION - Following the basic science and clinical science course, this course introduces the Student in cardio-thoracic conditions which commonly cause disability. The objective of this course is that after lectures and demonstration in addition to clinics the student will be able to demonstrate an understanding of Cardio-thoracic conditions causing disability and their management. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by cardiovascular pathology on the functioning of the individual.

1. Anatomy and Physiology
   a. Respiratory system
      i. Upper respiratory tract
      ii. Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments
      iii. Respiratory unit, hilum of lung.
      iv. Muscles of respiration
      v. Pleura, intra pleural space, intra pleural pressure, surfactant
      vi. Mechanics of respiration – Chest wall movements, lung & chest wall compliance
      vii. V/Q relationship, airway resistance
      viii. Respiratory centre, Neural & chemical regulation of respiration
      ix. Lung volumes and lung capacities, Spirometer, lung function test
      x. Pulmonary circulation, Lung sounds, cough reflex
   b. Cardiovascular systems
      i. Chambers of heart, semi lunar and atria ventricular valves
      ii. Coronary circulation, conductive system of heart
      iii. Cardiac cycle, ECG, Heart sounds
      iv. Blood pressure, pulse, cardiac output

2. Cardio Vascular system
   a. Define, etiology, pathogenesis, clinical features, complications,
   b. Conservative and surgical management of the following conditions
      i. Ischemia heart disease
      ii. Myocardial infarction
      iii. Heart failure
      iv. Cardiac arrest
      v. Rheumatic fever
      vi. Hypertension
      vii. Infective endocarditis
viii. Myocarditis & cardiomyopathy

c. Cardiovascular Disease: Examination of the Cardiovascular System
   Investigations: ECG, Exercise Stress Testing, Radiology; Clinical manifestations of
   Cardiovascular disease; Definition, Etiology, Clinical features, signs and symptoms, complications,
   management and treatment of following diseases and disorders of the heart: Pericarditis, Myocarditis,
   Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary
   Valve Disease, Congenital disorders of the Heart, Cardiac Arrest; Examination and Investigations
   of diseases of arteries and veins; Hypertension: Definition, causes, classification, types, assessment,
   investigations and management.

d. Disorders of the Heart – Definition, Clinical features, diagnosis and choice
   of management for the following disorders: Congenital Heart diseases – Acyanotic
   congenital heart disease & Cyanotic congenital heart disease: Patent Ductus Arteriosus, Coarctation
   of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of
   Great Vessels; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and
   Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

3. Respiratory System
   a. Respiratory Disease: Examination of the Respiratory System – Investigations: Chest
      Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis; Clinical
      manifestations of Lung disease; Patterns of lung disease – Chronic Obstructive Lung
      Disease and Restrictive Lung Disease; Definition, Etiology, Clinical features, signs and
      symptoms, complications, management and treatment of following lung diseases:
      Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper
      Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial
      Lung Diseases, Diseases of the pleura, diaphragm and chest wall; Respiratory failure –
      Definition, types, causes, clinical features, diagnosis and management.

   b. Chest wall disorders: Definition, Clinical features, diagnosis and choice of
      management for the following disorders – chest wall deformities, chest wall tumors,
      Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis,
      Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of
      the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea,
      Lesions of the Mediastinum. Carcinoma of the female breast.

PRINCIPLES OF MANAGEMENT

The course is intended to provide a knowledge about the basic principles of Management.

1. Introduction to management
2. Strategic Management
3. Foundations of Planning
4. Planning Tools and Techniques
5. Decision Making, conflict and stress management
6. Managing Change and Innovation
7. Understanding Groups and Teams
8. Leadership
9. Time Management
10. Cost and efficiency

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION

Eighth Semester

PHYSIOTHERAPY IN CARDIO VASCULAR PULMONARY AND INTENSIVE CARE –

SUBJECT DESCRIPTION - The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient’s vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

THEORY -

1. Anatomical and Physiological differences between the Adult and Pediatric lung.
4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP,IPPB.
5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP.
7. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.
9. Physiotherapy in Obstructive lung conditions.
10. Physiotherapy in Restrictive lung conditions.
12. Pulmonary Rehabilitation.
13. Physiotherapy following Lung surgeries
15. Introduction to ICU: ICU monitoring – Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.

16. Physiotherapy management following cardiac surgeries.

17. Cardiac Rehabilitation.

18. Physiotherapy management following PVD.

19. Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.

20. Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes.

21. Home program and education of family members in patient care.

22. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.

**PRACTICAL:**
Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

**COMMUNITY PHYSIOTHERAPY**

**SUBJECT DESCRIPTION** - The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilititating and restoring functions.

1. Rehabilitation: Definition, Types.
2. Community: Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community oriented programme, Community participation and mobilization.
3. Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR.
5. Planning and management of CBR Programmes, CBR Programmed planning and management, Ownership and Governance, Decentralization and CBR, Management of CBR,
Programmed sustainability, Communication and Coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies.


9. Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation.


11. National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker

12. Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuro-musculoskeletal and cardiothoracic disabilities.

13. Screening and rehabilitation of paediatric disorders in the community: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high risk babies, Genetic counselling.


15. Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services.


17. Industrial Health & Ergonomics [10 hours] - Occupational Hazards in the industrial area -- Accidents due to
   a. Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing radiation,
   b. Chemical agents-Inhalation, local action, ingestion,
   c. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy –
i. sedentary table work – executives, clerk,  
ii. inappropriate seating arrangement – vehicle drivers  
iii. constant standing – watchman, Defense forces, surgeons,  

d. Psychological hazards- e.g. – executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management-relaxation modes.

e. Biological Hazards

PRACTICAL: This will consist of Field visits to urban and rural PHC’s., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community, Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

CLINICAL REASONING AND EVIDENCE BASED PHYSIOTHERAPY PRACTICE -

1. Introduction to Evidence Based Practice: Definitions, Evidence Based Practice,
2. Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, and Creativity
3. Development of Evidence based knowledge, The Individual Professional, Professionals within a discipline, and Professionals across disciplines
4. Evidence Based Practitioner: The Reflective Practitioner, The E Model, Using the E Model
5. Finding the Evidence: Measuring outcomes in Evidence Based Practice, Measuring Health Outcomes, Measuring clinical outcomes, Inferential statistics and Causation
7. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system, Outcome Measurement, Biostatistics, The critical review of research using qualitative methods
8. Systematically reviewing the evidence: Stages of systematic reviews, Meta-analysis, The Cochrane collaboration
9. Economic evaluation of the evidence: Types of economic evaluation, conducting economic evaluation, critically reviewing economic evaluation, locating economic evaluation in the literature
10. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs
12. Communicating evidence to clients, managers and funders: Effectively communicating evidence, Evidence based communication in the face of uncertainty; Evidence based communication opportunities in everyday practice
13. Research dissemination and transfer of knowledge: Models of research transfer, Concrete research transfer strategies, Evidence based policy

ADMINISTRATION AND TEACHING SKILLS

1. Introduction:
   a. Branches of administration, Nature and scope of administration, How to be an effective administrator, Planning hospital administration as part of a balanced health care program.
   b. Principles of hospital administration and its applications to physiotherapy.
   c. Planning and organization: Planning cycle, Principles of organizational charts, Resource and quality management, planning change -innovation
   d. Financial issues including budget and income generation
   e. Hospital administration: Organization, Staffing, Information, Communication, Coordination, Cost of services, Monitoring and evaluation.
   f. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources.
   g. Organizing meetings, committees, and negotiations
   h. Personnel management: Personnel performance appraisal system, Quality care delivery from the staff.

2. Aims of physiotherapy education
   a. Concepts of teaching and learning
   b. Curriculum development
   c. Principles and methods of academic and clinical teaching
   d. Measurement and evaluation
   e. Guidance and counseling
   f. Faculty development program
   g. Administration in clinical setting
   h. Use of A-V aids in teaching
   i. Taxonomy of education

RESEARCH PROJECT- The project may be a case study or of recent technique or literature reviews and etc. to make the student to have research mind and to facilitate for higher studies.

CLINICAL EDUCATION- Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU
7. Developmental Pediatrics & Child Guidance Clinic
8. OBG
9. Geriatric – Old Age Homes
10. Industrial Visits - Ergonomics

**Ninth Semester**

**INTERNSHIP** - 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.

1. **Initial Assessment Documentation:** Clinical staff must document the following information:
   a. Initial assessment documented based on SOAP format.
   b. Subjective examination (symptomatic)
   c. Objective examination (measureable, observable)
   d. Action/Analysis (interpretation of current condition/intervention provided)
   e. Plan of action
   f. Written or verbal feedback to the client or other relevant carers
   g. Discharge plan documented
   h. Agreement to treatment plan by patient or “person responsible”

2. **Progress Documentation:** Progress documentation may include the following information:
   a. Any individual intervention should be documented in SOAP format (including response to intervention/s using outcome measures)
   b. Oral consent obtained and documented when there is a significant change in treatment/treatment options/status of patient’s health.
   c. Written consent obtained for designated invasive procedures
   d. Change in status or events that may affect discharge plans/goals
   e. Documented consultation with key clinical team members
SKILLS BASED OUTCOMES AND MONITORABLE INDICATORS FOR BACHELOR OF PHYSIOTHERAPY

Bachelor of Physiotherapy

Competency Statements

1. Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.
2. Collects assessment data relevant to the client’s needs and physiotherapy practice.
3. Be able to conduct the patient evaluation and assessment as per condition.
4. Analyzing Assessment findings & Establish a physiotherapy diagnosis and prognosis.
5. Develops and Recommends an intervention strategy.
6. Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan.
7. Implements intervention.
8. Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises.
9. Advise patient on appropriate nutrition, exercises, rest, relaxation other issues.
10. Evaluates the effectiveness of interventions.
11. Be able to complete accurate treatment documentation.
12. Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.
13. Establishes and maintains inter professional relationships, which foster effective client-centered collaboration.
14. Understand the principles of continuous quality improvement.
15. Be able to carry out the daily/weekly Quality Control (QC) checks.
16. Be able to review the literature.
17. Be able to suggest implementation of research findings.
18. Be able to suggest/initiate topics for physiotherapy research.
19. Be able to interpret, apply and disseminate information as a member of the physiotherapy team.

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<th>Sl No</th>
<th>Learning Outcomes</th>
<th>Knowledge/Comprehension</th>
<th>Application/Synthesis/Evaluation</th>
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<tbody>
<tr>
<td>1.</td>
<td>Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes</td>
<td>● Able to Collect and review background information relevant to the client’s health. ● Understands the client’s expectations related to physiotherapy services. ● Able to Collect and review health information about the client from other sources (e.g., other sources may include previous health records, other health care practitioners,</td>
<td>● Develop rapport to obtain history and current health status. ● Use interviewing skills appropriate to the patient/client. ● Obtain a relevant history and current health status. ● Interpret the patient’s/client’s verbal and non-verbal responses. ● Determines the personality traits.</td>
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<td>professional colleagues, or family).</td>
<td>• Analyze how the differences in personality influence approach</td>
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<td>• Identify client’s prior functional abilities, physical performance, and participation.</td>
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<td></td>
<td>• Identifies the client’s personal and environmental factors affecting his/her functional abilities, physical performance, and participation.</td>
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<td>2.</td>
<td>Collects assessment data relevant to the client’s needs and physiotherapy practice.</td>
<td>• Informs the client of the nature and purpose of assessment as well as any associated significant risk.</td>
<td>• Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment.</td>
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<td></td>
<td>• Perform patient assessment procedure safely and accurately, taking into account client consent, known indications, guidelines, limitations and risk-benefit considerations.</td>
<td>• Monitors the client’s health status for significant changes during the course of assessment and takes appropriate actions as required.</td>
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<td></td>
<td>• Safely and accurately examines and re-examines a patient using standardized measures.</td>
<td>• Perform assessment procedure safely and accurately, taking into account client consent, known indications, guidelines, limitations and risk-benefit considerations.</td>
</tr>
<tr>
<td>3.</td>
<td>Be able to conduct the patient evaluation and assessment as per condition.</td>
<td>• Be familiar with different assessment techniques.</td>
<td>• Safely and accurately examines and re-examines a patient using standardized measures.</td>
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<td>• Able to examine higher motor functions, cranial nerves, ROM, MMT, Muscle tightness, muscle tone, myotome, sensory evaluation, balance, coordination, hand function, functional outcome measures, Physical fitness, cardio-respiratory evaluation, posture &amp; gait.</td>
<td>• Apply pertinent tests and measurements.</td>
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<td>• Be familiar with special tests.</td>
<td>• Interpret all assessment findings to allow for identification of the patient/client’s impairments, activity limitations and participation restrictions.</td>
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<td>• Basic knowledge on radiological findings &amp;</td>
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| 4.    | Analyzing assessment findings & Establish a physiotherapy diagnosis and prognosis. | - Identifies the nature and extent of the client’s impairments, activity limitations, and participation restrictions within the context of the client’s needs.  
- Identifies environmental and personal supports and barriers relevant to the patients.  
- Determines the relationship among the assessment findings.  
- Interprets findings and reaches a differential diagnosis  
- Establishes a diagnosis for physiotherapy, identifies risks of care, and makes appropriate clinical decisions based upon the examination, evaluation and current available evidence.  
- Formulates a physiotherapy diagnosis based on the analysis of patients assessment findings.  
- Discusses physiotherapy diagnosis and prognosis with the patient & care givers | |
| 5.    | Develops and recommends an intervention strategy. | - Establishes and prioritizes, with the patient, expected outcomes based on the assessment findings and evidence-informed practice.  
- Recommends a service approach consistent with the client’s needs, goals and all available resources.  
- Discuss the current patient condition among multidisciplinary team | - Establishes goals that are specific, measurable, action oriented, realistic, and time-specific.  
- Selects interventions that are evidence-based and consistent with the client’s goals, general health status, functional needs, and assessment findings.  
- Identifies when physiotherapy services are not required or indicated and refers for other services as appropriate. |
<p>| 6.    | Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan | Know the patient mental and physical condition | Operate the most appropriate equipment for the individual patient within the context of the protocol. |
| 7.    | Implements intervention | - Oriented the client to the practice setting and | Performs physiotherapy interventions in accordance with the protocol. |</p>
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<td></td>
<td>provides information about relevant service/policies (e.g., location, duration, frequency, cost; introduce client to all staff involved in their care; expected completion of service).</td>
<td>with client consent and in a safe and effective manner.</td>
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<td>- Discuss the importance of exercises and how it should be carried out</td>
<td>- Educates the client about health promotion, self-management, and relevant services with respect to his/her unique condition.</td>
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<td>- Be familiar with the treatment plans for all patients on the treatment unit</td>
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<td>- Identify the co-morbidities that will impact on patient condition</td>
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<td>- Recognize if any adverse reactions is occurring</td>
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<tr>
<td>8.</td>
<td>Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises</td>
<td>- Discuss the importance of exercises and how it should be carried out</td>
<td>- Interpret the treatment plan and use the equipment accordingly</td>
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<tr>
<td></td>
<td></td>
<td>- Be familiar with the treatment plans for all patients on the treatment unit</td>
<td>- Teach patients the exercise procedures and methods of doing them.</td>
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<tr>
<td></td>
<td></td>
<td>- Identify the co-morbidities that will impact on patient condition</td>
<td>- Evaluate the patient’s general condition prior to commencing the exercises.</td>
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<td>- Recognize if any adverse reactions is occurring</td>
<td>- Analyze the information and integrate to define the optimal patient condition.</td>
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<td>9.</td>
<td>Advise patient on appropriate nutrition, exercises, rest, relaxation other issues</td>
<td>- Explain the impact of exercise and nutritional status of patient during treatment</td>
<td>- Assess the patient’s status after exercise and proper diet.</td>
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<td>10.</td>
<td>Evaluates the effectiveness of interventions.</td>
<td>- Discuss with the client, the nature, purpose and results of ongoing assessment and outcome evaluations.</td>
<td>- Monitors client responses and changes in status during the interventions and modifies intervention accordingly.</td>
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<td>- Consults with the patient to redefine goals and modifies or discontinues intervention strategies as necessary.</td>
<td>- Evaluates effectiveness of the intervention strategy on an ongoing basis using appropriate outcome measures.</td>
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<tr>
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<td></td>
<td>- Discuss with the client, the nature, purpose and results of ongoing assessment and outcome evaluations.</td>
<td>- Assesses client status prior to the completion of physiotherapy service and compares with initial assessment findings.</td>
</tr>
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<td>- Consults with the patient to redefine goals and modifies or discontinues intervention strategies as necessary.</td>
<td>- Communicates with the client about service completion &amp; recommends self-management option.</td>
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<tr>
<td>11.</td>
<td>Be able to complete accurate treatment documentation.</td>
<td>- Recognize the importance of accurate transfer of information to allow for</td>
<td>- Ensure that the ethical and legal requirements of documentation are</td>
</tr>
<tr>
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| 12.   | Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication. | ● Be familiar with the psychological status of the patient.  
● Knowledge of few counseling procedures. | ● Demonstrates sensitivity to the uniqueness of others.  
● Listens effectively and facilitates discussion to ensure reciprocal exchange of information.  
● Demonstrates an awareness of self behaviours and the responses of others and adapts communications appropriately.  
● Able to assess psychological status of patient. |
| 13.   | Establishes and maintains inter professional relationships, which foster effective client-centered collaboration. | ● Integrates knowledge and understanding of the physiotherapist role and the roles of others in providing client-centred care.  
● Consults and shares relevant information with clients, other health professionals, and all relevant individuals or groups in a timely manner. | ● Demonstrates an understanding of and respects the roles, responsibilities and differing perspectives of team members.  
● Practice in accordance with legislation regulations and ethical guidelines.  
● Fosters collaboration with relevant others. |
| 14.   | Understand the principles of continuous quality improvement | ● Identify the components of a quality plan.  
● Discuss the role of quality assurance such as principles of an accreditation/audit programme  
● Undertake peer review and self-evaluation | ● Modify and adapt professional practice in response to evaluation and/or feedback from the patient/client, peer, supervisor Contribute to in-service activities  
● Reflect on the outcomes of interventions and modify practice accordingly |
<p>| 15.   | Be able to carry | ● Explain Quality | ● Perform the |</p>
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<td>out the daily/weekly Quality Control (QC) checks</td>
<td>Management System (QMS), Quality Assurance (QA) and Quality Control (QC)</td>
<td>daily/weekly/monthly QC procedures</td>
</tr>
<tr>
<td>16.</td>
<td>Be able to review the literature</td>
<td>• Define search terms for specific treatment sites</td>
<td>• Identify the appropriate literature in the area of interest. • Identifying research gap.</td>
</tr>
<tr>
<td>17.</td>
<td>Be able to suggest implementation of research findings</td>
<td>• Identify relevant sources of Research</td>
<td>• Evaluate research with respect to current departmental practice</td>
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<tr>
<td>18.</td>
<td>Be able to suggest/initiate topics for physiotherapy research</td>
<td>• Identify literature to support research proposal • Define the necessary steps in preparing and carrying out research</td>
<td>• Review the literature in the area. • Formulate a research question. • Conducts research systematically.</td>
</tr>
<tr>
<td>19.</td>
<td>Be able to interpret, apply and disseminate information as a member of the physiotherapy team</td>
<td>• Define and explain the data that must be disseminated</td>
<td>• Identify the appropriate personnel to whom specific information should be disseminated. • Communicate the correct, relevant and appropriate information</td>
</tr>
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4.2. Masters in Physiotherapy
Masters of Physiotherapy

Introduction:

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

1. Able to execute all routine physiotherapeutic procedures with evidence based practice.
2. Able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures.
3. Able to provide adequate knowledge about the treatment procedures and its benefit.
4. Able to transfer knowledge and skills to students as well young professionals.
5. Able to perform independent physiotherapy assessment and treatment for patients.
6. Able to undertake independent research in the field of physiotherapy.
7. Learn multidisciplinary practice skills.
8. Able to practice and assess patient independently.
9. On successful completion of M.P.T programme, the Physiotherapist professional will be able to take up physiotherapy teaching assignments independently for undergraduate teaching programme. He / She will be able to prepare project proposal with selected research design and interpret the evaluated outcome measures (using sound data processing techniques and statistical methods). He/she will be able to practice in his / her specialty area with advanced knowledge and skills.

Expectation from the future graduate in the providing patient care.

1. Course work includes exercise physiology, principles of physiotherapy practice, electrophysiology and electives (during 2nd year of MPT). The student will be skilled in treatment planning, management, administration of physiotherapy treatment and provision of patient support.
2. Acquire in-depth knowledge of structure and function of human body related to the respective branch of specialty.
3. Acquire the in-depth knowledge of movement dysfunction of human body, cause thereof principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.
4. Demonstrate skill in Physical & Functional diagnosis pertaining to patient under his/her care.
5. Demonstrate ability to critically appraise recent physiotherapeutic and related literature from journals & adopt diagnostic & therapeutic procedures based on it.
6. The student will also perform independent research within the department and help the department and the team for treatment planning of the patient.
7. PT post-graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology the professional should opt for continuous professional education credits offered by national and international institutes.
8. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent physiotherapy clinics and as well as teaching institutes.
9. Demonstrate ability to make clinical decision (based on evaluation) regarding Physiotherapy strategy techniques and select appropriate outcome measures based on the comprehensive knowledge of specialty.

10. Demonstrate an expertise in evidence-based skill in the management disorders including movement dysfunction in concerned specialty.

11. Demonstrate an expertise in health promotion, early identification and intervention for quality restoration of function.

12. Planning and implementation of treatment programme adequately and appropriately for all clinical conditions common as well as rare related to respective specialty in acute and chronic stage, in intensive care, indoor, outdoor and institutional care, independent practice, on fields of sports and community and during disaster situations.

13. Demonstrate proficiency in creating awareness using newer technology, at various levels in community for healthcare & professional awareness.

14. Demonstrate leadership, managerial, administrative & communication skills.

15. Demonstrate the knowledge of legislation applicable to compensation for functional disability welfare schemes & rights of the disabled, laws related to industrial workers & disabled & appropriate certification.

16. Demonstrate proficiency in classroom and clinical teaching using newer and appropriate technology.

**Eligibility for admission:**

**Selection procedure:**

1. He/she has passed the BSc in Physiotherapy / Bachelor of Physiotherapy recognized by any Indian University with pass marks (50%).

2. 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.

3. Admission to Masters of Physiotherapy course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.
   a. Entrance test, to be conducted by the university as per the syllabus.
   b. Successful candidates on the basis of written test will be called for the interview & shall have face an interview board. The interview board will include the Head of the Department of Physiotherapy (Chairman of the Board) along with the senior medical doctor apart from other nominees, whose recommendations shall be final for the selection of the students.
   c. During subsequent counseling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.
   d. Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.
   e. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice.
Duration of the course
Duration of the course: 4 semesters/ 2 Years
Total hours – 3240

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 will be permitted to appear for the University Examination for any semester if he / she secure not less than 85% of attendance in the number of instructional days/ practical at hospitals during the calendar year, failing which he / she should complete the number of days/hours and undergo the next semester/year/final examination conducted by the university.

Methods of training
The training of postgraduate for MPT degree shall be on a full time pattern with graded responsibilities in the management and treatment of patients entrusted to his / her care. The participation of all the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, clinical rounds, care demonstrations, clinics, journal review meetings & CME. Every candidate should be required to participate in the teaching and training programs of undergraduate students. Training should include involvement in laboratory experimental work and research studies.

Assessment:
The examination to the first/second year shall be open to a student who:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects.

Work diary
Every candidate shall maintain a work diary and record his/her participation in the training programmers conducted by the department such as journal reviews, seminars etc. Special mention may be made of the presentations by the candidate as well as details of clinical of laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution and presented in the university examination.

Periodic tests
The College may conduct periodic tests. The test may include written theory papers, practical, viva voce and clinical in the pattern of university examination. Records and marks obtained in such tests will be maintained by the Head of Department and sent to the University, when called for.

The assessment will be comprised of. Formative and summative-

- Theory, inter-departmental meeting
• Practical, clinical rounds and bed side evaluation & application.
• Journal club
• Dissertation
• Open discussion, debate, Viva.
• Seminars, recent advances, case presentation, discussion and clinical conference.

**Graded responsibility in the care of patients and operative work** (Structured Training Schedule of clinical & elective subjects only)

<table>
<thead>
<tr>
<th>Category</th>
<th>I year MPT</th>
<th>II year MPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>20 Cases</td>
<td>20 Cases</td>
</tr>
<tr>
<td>A</td>
<td>20 Cases</td>
<td>30 Cases</td>
</tr>
<tr>
<td>PA</td>
<td>100 Cases</td>
<td>60 Cases</td>
</tr>
<tr>
<td>PI</td>
<td>20 Cases</td>
<td>50 Cases</td>
</tr>
</tbody>
</table>

**Key:**

- **O** – Observes
- **A** – Assisted a more senior Physiotherapist
- **PA** – Performed procedure under the direct supervision of a senior specialist. **PI** – Performed Independently

• Teaching Activities – UG Teaching
• Learning Activities : Self Learning, Use of computers & library
• Participation in departmental activities;
  - Journal Review meetings
  - Seminars
  - Clinical presentation
  - Special clinics
  - Inter departmental meetings
  - Community work, camps / field visits
  - Clinical rounds
  - Dissertation work
  - Participation in conferences/ presentation of paper -Minimum 2 in two years
  - Any other – Specify (eg : CME)
  - Rotation and posting in other departments in any – minimum 2 months in 1 specialty
Curriculum Outline

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Teaching &amp; Learning Methods</th>
<th>Weekly Class</th>
<th>Total Hours</th>
</tr>
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<tbody>
<tr>
<td>1st Year</td>
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<td></td>
<td></td>
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<tr>
<td>First semester – 1st Year</td>
<td>Lectures</td>
<td>2</td>
<td>180</td>
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<tr>
<td></td>
<td>Seminars</td>
<td>2</td>
<td>180</td>
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<tr>
<td></td>
<td>Practical and Demonstrations</td>
<td>4</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td>Clinical Discussions</td>
<td>2</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Clinical Case presentations</td>
<td>2</td>
<td>180</td>
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<tr>
<td></td>
<td>Journal Club</td>
<td>2</td>
<td>180</td>
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<tr>
<td></td>
<td>Classroom Teaching</td>
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<td>90</td>
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<td>Library</td>
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<td>270</td>
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<tr>
<td></td>
<td>Clinical Training</td>
<td>15</td>
<td>1350</td>
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<tr>
<td></td>
<td>Synopsis &amp; Dissertation work</td>
<td>3</td>
<td>210</td>
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<tr>
<td></td>
<td>Community Camps, Field Visits, Participation in Workshops &amp; Conferences</td>
<td></td>
<td>60</td>
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<tr>
<td></td>
<td>TOTAL HOURS</td>
<td>36</td>
<td>3240</td>
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</tbody>
</table>

Scheduled outline shall be maintained as minimum standard for MPT program with higher order of teaching and learning process. Hours for lecture shall not be given separately for each subject and will be planned by teacher concerned.

First Semester

PROFESSIONAL PRACTICE -
(History, Laws, Ethics, Administration, Education)
1. Development of Physiotherapy Profession
2. Laws governing physiotherapy practice
4. Roles of the physiotherapist
5. Standards for practice for physiotherapist and the criteria
6. History taking, assessment, tests, Patient communication, documentation of findings, treatment organization and planning/execution for intervention.
7. Documentation of rehabilitation assessment and management using International Classification of Functioning Disability and Health (ICF)
8. Standardized tests and scales used in various types of cases for assessment and interpretation in Physiotherapy practice.
RESEARCH METHODOLOGY AND BIOSTATISTICS –

RESEARCH METHODOLOGY

1. Introduction to research
2. Types of research
3. Defining a research question
4. Qualitative study designs
   a. Grounded theory and Phenomenological methods.
5. Use of Delphi process
6. Quantitative study
7. Type I and type II bias
8. Study design: types
   a. Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.
9. Sampling design, calculating minimum sample size based on design
11. Outcome measures: Use of outcome measures in rehabilitation research
12. Research Methods: Designing methodology, Reporting results, Type I and Type II bias.
13. Communicating research.
14. Evaluating published research: looking at the evidence
15. Introduction to evidence based practice, evaluating evidence,
16. Asking clinical questions
17. Translating of evidence into practice: strategies

APPLIED BIOSTATISTICS

1. Descriptive Statistics and measurement variability
2. Statistical inference
3. Comparison of group means: T-test
4. Analysis of variance
5. Multiple comparison tests
6. Non parametric tests
7. Correlations
8. Regression
9. Analysis of frequencies: Chi square
10. Statistical measure of reliability
11. Power analysis – Determining sample size
12. Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio
SCIENTIFIC WRITING
3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research
4. Significance of Report writing; Different steps in Report writing; Mechanics and precautions of writing research reports Oral and poster presentation of research papers in conferences/symposia; Preparation of abstracts.

BIOMECHANICS & CLINICAL KINESIOLOGY
1. Biomechanics of Tissues and structures of the musculoskeletal system and clinical application.
3. Clinical kinesiology of posture.
4. Biomechanics and patho mechanics of respiration, circulation, hand function and gait.
5. Methods of kinetics and kinematics investigation
6. Patient Positioning, Body Mechanics and Transfer Techniques
7. Ergonomic Approach to lifting and handling, workspace and Environment

RESIDENCY PART –I
In the residency the professional is expected to work and contribute in the physiotherapy unit.

Second Semester

EXERCISE PHYSIOLOGY & NUTRITION
1. Sources of Energy, Energy Transfer and Energy Expenditure at rest and various physical activities.
2. Physiology of Movement
3. Responses and Adaptations of various systems to Exercise and training.
5. Special aids to performance and conditioning.
6. Body consumption, nutrition and caloric balance and performance
7. Considerations of age and sex in exercise and training.
8. Exercise prescription for health and fitness with special emphasis to cardiovascular disease, Obesity and Diabetes.
9. Fatigue assessment and scientific organization of work-rest regimes to control fatigue.
10. Supplementary nutrition

ELECTROPHYSIOLOGY & ELECTRO DIAGNOSIS
2. Instrumentation for neuromuscular electrical stimulation.
3. Anatomy and physiology of peripheral nerve, muscle and neuromuscular junction.
4. Electrical properties of muscle and nerve.
5. Muscles plasticity in response to electrical stimulation.
6. Electrical stimulation and its effects on various systems.
7. Clinical Electro physiological testing.
8. Safety considerations in electrotherapy

PHYSIOTHERAPY DIAGNOSIS AND CLINICAL DECISION MAKING -
1. Clinical examination in general and detection of movement dysfunction.
2. Principles of pathological investigations and imaging techniques related to neuromuscular, skeletal and cardiopulmonary disorders with interpretation.
4. Anthropometric measurements.
5. Physical fitness assessment by Range of motion, Muscle strength, endurance and skills, Body consumption, Fitness test for sports.
6. Evaluation Methods, Special tests and Scales used in Musculoskeletal, Neurological and Cardiopulmonary disorders.
7. EMG and Biofeedback.
10. Aids and appliances, adaptive functional devices to improve movement dysfunction.
11. Exercise ECG testing and monitoring.
12. Pulmonary function tests and Spirometry.
13. Physical disability evaluation and disability diagnosis.
15. Clinical decision making in electrotherapeutics

PRACTICAL -
1. Introduction to Screening For Referral In Physiotherapy
   a. Reasons to Screen
   b. Screenings and Surveillance
   c. Diagnosis by the Physiotherapist
   d. Differential Diagnosis Versus Screening
   e. Direct Access
2. Introduction to the interviewing process
   a. Concepts in Communication
   b. Cultural Competence
   c. The Screening Interview
   d. Subjective Examination
   e. Core Interview
   f. Hospital Inpatient Information
3. Overview of the physiology of pain and systemic causes of pain
   a. Mechanisms of Referred Visceral Pain
   b. Multisegmental Innervations
   c. Assessment of Pain and Symptoms
d. Sources of Pain

5. Physical assessment as a screening tool
   a. General Survey
   b. Techniques of Physical Examination
   c. Integumentary Screening Examination
   d. Nail Bed Assessment
   e. Lymph Node Palpation
   f. Musculoskeletal Screening Examination
   g. Neurologic Screening Examination
   h. Regional Screening Examination
   i. Systems Review

6. Screening for hematologic disease
   a. Signs and Symptoms of Hematologic Disorders
   b. Classification of Blood Disorders

7. Screening for cardiovascular disease
   a. Signs and Symptoms of Cardiovascular Disease
   b. Cardiac Pathophysiology
   c. Cardiovascular Disorders
   d. Laboratory Values.

8. Screening for pulmonary disease
   a. Signs and Symptoms of Pulmonary Disorders
   b. Inflammatory/Infectious Disease
   c. Genetic Disease of the Lung
   d. Occupational Lung Diseases
   e. Pleuropulmonary Disorders

9. Screening for gastrointestinal disease
   a. Signs and Symptoms of Gastrointestinal Disorders
   b. Gastrointestinal Disorders

10. Screening for hepatic and biliary disease
    a. Hepatic and Biliary Signs and Symptoms
    b. Hepatic and Biliary Pathophysiology
    c. Gallbladder and Duct Diseases

11. Screening for urogenital disease
    a. Signs and Symptoms of Renal and Urological Disorders,
    b. The Urinary Tract
    c. Renal and Urological Pain
    d. Renal and Urinary Tract Problems

12. Screening for endocrine and metabolic disease
    a. Associated Neuromuscular and Musculoskeletal Signs and Symptoms
b. Endocrine Pathophysiology

c. Introduction to Metabolism

12. Screening for immunologic disease
   a. Using the Screening Model
   b. Immune System Pathophysiology
   c. Physician Referral

13. Screening for Cancer
   a. Cancer Statistics
   b. Risk Factor Assessment
   c. Cancer Prevention
   d. Major Types of Cancer
   e. Metastases
   f. Clinical Manifestations of Malignancy
   g. Oncologic Pain
   h. Side Effects of Cancer Treatment
   i. Cancers of the Musculoskeletal System
   j. Primary Central Nervous System Tumors
   k. Cancers of the Blood and Lymph System

14. Screening the head, neck, and back
   a. Using the Screening Model to Evaluate the Head, Neck, or Back,
   b. Location of Pain and Symptoms
   c. Sources of Pain and Symptoms
   d. Screening for Oncologic Causes of Back Pain
   e. Screening for Cardiac Causes of Neck and Back Pain
   f. Screening for Peripheral Vascular Causes of Back Pain
   g. Screening for Pulmonary Causes of Neck and Back Pain
   h. Screening for Renal and Urologic Causes of Back Pain
   i. Screening for Gastrointestinal Causes of Back Pain
   j. Screening for Liver and Biliary Causes of Back Pain
   k. Screening for Gynecologic Causes of Back Pain
   l. Screening for Male Reproductive Causes of Back Pain
   m. Screening for Infectious Causes of Back Pain

15. Screening the sacrum, sacroiliac, and pelvis
   a. The Sacrum and Sacroiliac Joint
   b. The Coccyx
   c. The Pelvis

16. Screening the lower quadrant: buttock, hip, groin, thigh, and leg
   a. Using the Screening Model to Evaluate the Lower Quadrant
   b. Trauma as a Cause of Hip, Groin, or Lower Quadrant Pain
   c. Screening for Systemic Causes of Sciatica
   d. Screening for Oncologic Causes of Lower Quadrant Pain
   e. Screening for Urologic Causes of Buttock, Hip, Groin, or Thigh Pain
   f. Screening for Male Reproductive Causes of Groin Pain
   g. Screening for Infectious and Inflammatory Causes of Lower Quadrant Pain
   h. Screening for Gastrointestinal Causes of Lower Quadrant Pain
i. Screening for Vascular Causes of Lower Quadrant Pain
j. Screening for Other Causes of Lower Quadrant Pain

17. Screening the chest, breasts, and ribs
   a. Using the Screening Model to Evaluate the Chest, Breasts, or Ribs
   b. Screening for Oncologic Causes of Chest or Rib Pain
   c. Screening for Cardiovascular Causes of Chest, Breast, or Rib Pain
   d. Screening for Pleuropulmonary Causes of Chest, Breast, or Rib Pain
   e. Screening for Gastrointestinal Causes of Chest, Breast, or Rib Pain
   f. Screening for Breast Conditions that Cause Chest or Breast Pain
   g. Screening for Other Conditions as a Cause of Chest, Breast, or Rib Pain
   h. Screening for Musculoskeletal Causes of Chest, Breast, or Rib Pain
   i. Screening for Neuromuscular or Neurologic Causes of Chest, Breast, or Rib Pain

18. Screening the shoulder and upper extremity
   a. Using the Screening Model to Evaluate Shoulder and Upper Extremity
   b. Screening for Pulmonary Causes of Shoulder Pain
   c. Screening for Cardiac Causes of Shoulder Pain
   d. Screening for Gastrointestinal Causes of Shoulder Pain
   e. Screening for Liver and Biliary Causes of Shoulder Pain
   f. Screening for Rheumatic Causes of Shoulder Pain
   g. Screening for Infectious Causes of Shoulder Pain
   h. Screening for Oncologic Causes of Shoulder Pain
   i. Screening for Gynecologic Causes of Shoulder Pain

ADVANCED PHYSIOTHERAPEUTIC -

1. Pain (neurobiology, various theories, modulation and management of pain)
3. Theories of motor control and motor learning.
4. Theories of aging.
5. Cardiopulmonary medications and their effect on activity performance.
6. Exercise planning and prescription.
7. Use of Exercise therapy techniques and application on various types of cases.
8. Application of electrotherapy techniques on patients, monitoring of dosages and winding up procedure.
9. Ergonomic aspects of exercise on oxygen, energy consumption MET value of various exercises and activity.
10. Effect of aerobic, anaerobic as well as Isometric and Isokinetic exercises on cardiac function.
11. Physiotherapy in psychiatric conditions.
12. Massage, Mobilization and Manipulation
13. Manual therapy – different schools of thought
15. Facilitation and inhibition techniques.
17. CPR, monitoring systems and defibrillators and artificial respirators.
18. Physiotherapy in common conditions of skin.
19. Physiotherapy following Plastic Surgery.
20. Physiotherapy following Obstetric and Gynecological Disorders.

Residency part –II
In the residency the professional is expected to work and contribute in the physiotherapy unit of various departments.

Third & Fourth Semester Combined for Elective Subjects

Elective Subjects

MUSCULOSKELETAL DISORDERS AND SPORTS –
1. Applied anatomy with emphasis on Biomechanics & Kinesiology of Human motion and Work Physiology
2. Clinical assessment and rationale of Laboratory investigations along with differential diagnoses.
3. Clinical Symptomatology, Pathophysiology and Patho-mechanics of musculoskeletal conditions
4. Physiotherapy management following fractures, dislocations and their complications, Amputations, cumulative trauma disorders and Burns.
5. Physiotherapy management in degenerative disorders and allied conditions.
6. Physiotherapy in post-operative management of metabolic, hormonal, neoplastic and infective conditions of bones and joints.
7. Physiotherapy following arthroplasty, implants and soft tissue repairs.
9. Kinetic and kinematics analysis for various functional activities.
10. Functional assessment (Hand function, Gait, Posture A.D.L; occupational work).
11. Hand Rehabilitation.
13. Physiotherapy management of locomotor disorder, principles of medical and surgical aspects, sports psychology and retraining.
15. Analysis and classification of sports and sports specific injuries and its management.
16. Management of sport injuries, sports fitness
17. Principles of Injury Prevention
19. Rehabilitation of paediatric musculoskeletal disorders.
20. Orthopaedic implants-designs, materials, indications, post-operative assessment and training.
23. Pilates-school of thought, Chiropractic school of thought, Osteopathic school of thought
24. Myofascial Release technique and Muscle Energy technique
26. Neuromuscular Taping Techniques
27. Electro diagnosis: Electromyography and evoked potential studies.
28. Community based rehabilitation in musculoskeletal disorders.
29. Recent Advances in Musculoskeletal Disorders and Sports Physiotherapy.

NEUROLOGICAL AND PSYCHOSOMATIC DISORDERS
1. Anatomy and Physiology of Nervous System.
2. Normal sequential behavioral and Physiological changes throughout the developmental arc.
3. Neurophysiology of balance, coordination and locomotion.
4. Clinical symptomatology and Pathophysiology of the neurological disorders
5. Principles of clinical neuro diagnosis and investigation.
7. Electrodiagnosis:
   a. Neurophysiology of Nerve conduction studies and Electromyography.
   b. Instrumentation of Electrical stimulator, EMG, SFEMG, NCS (Nerve Conduction Studies).
   d. Repetitive nerve stimulation.
   e. Evoked potentials (SSEP, MEP, BAERA, and VER).
   f. Interpretation of neurophysiologic responses in Neuropathy, myopathy and neuromuscular disorders.
8. Evaluation of A.N.S dysfunction with reference to psycho-physiological testing. Biofeedback training
10. Theories of motor control and theories of motor learning, its application in physiotherapy.
11. Common facilitatory and inhibitory techniques.
12. Treatment approaches in neurological rehabilitation: Bobath, NDT, SI, Brunnstrom, Roods, PNF, Vojta, MRP, MFR
13. Musculoskeletal treatment concept applied to neurology: Adverse neural tissue tension tests in upper limb and lower limb.
14. Pathophysiology and Management of tonal abnormalities (Spasticity, Rigidity, Hypotonia, and Dystonia)
15. Medical and Physiotherapy management following Cerebrovascular accidents.
16. Traumatic Brain Injury. (ICU management, Coma stimulation, Restoration of motor control, Rehabilitation and community integration)
17. Traumatic spinal cord injuries. (ICU management, Coma stimulation, Restoration of motor control, Rehabilitation and community integration)
18. Physiotherapy management of demyelinating, inflammatory, infectious, degenerative and metabolic diseases of the nervous system.
19. Physiotherapy management of Motor neuron diseases, neuromuscular junction disorders, Brain tumor, and Neuro cutaneas disorders.
20. Diseases of spinal cord, peripheral nerves and cranial nerves
22. Paediatric neurology (Cerebral Palsy, Developmental disorders, Neuropsychiatric disorders, Cerebral & Craniovertebral anomalies & metabolic disorders of nervous system).
24. Oromotor rehabilitation.
26. Bladder and Bowel dysfunction and its rehabilitation.
27. Assessment and management of various neurological gaits.
29. Associated functional disturbances of higher functions and their testing and training.
31. Learning skills, A.D.L. and functional activities.
32. Aids and appliances in neurological disorders. Prescriptions, testing and training.
33. Basic knowledge of drugs used for neurological conditions.
34. Assessment of fitness and exercise prescription for special neurological population – Stroke, Paraplegia, TBI, Multiple Sclerosis, MND, Parkinsonism, & Ataxia.
35. Community based rehabilitation for neurological dysfunction. Disability evaluation and management.
36. Stem cell therapy in neurological disorders
37. Recent Advances in Neurological Rehabilitation.

CARDIO-RESPIRATORY DISORDERS

1. Anatomy and physiology of cardio-vascular and respiratory systems.
2. Biomechanics of respiration.
3. Intrauterine development of cardiopulmonary system and difference between the adult and pediatric cardiopulmonary system.
4. Epidemiology, Symptomatology and pathophysiology of the cardio-respiratory disorders.
5. Clinical assessment, rationale of laboratory investigations and differential diagnosis,
7. Evaluation cardiac dysfunction. [ECG, exercise ECG testing, Holter monitoring etc., Echo-cardiogram, X-Ray, Imaging techniques etc.]
8. Evaluation of peripheral vascular disorders: clinical, blood flow studies, temperature plethysmography. A.N.S dysfunction testing.
9. Risk factors and preventive measures in cardio respiratory conditions
11. Intensive care unit – Concept and set-up, equipment for advanced methods of resuscitation, monitoring and patent management: artificial airways, ventilators, pulse –oxymetry etc
12. Oxygen therapy.
13. Cardio-pulmonary resuscitation.
14. Respiratory physiotherapy techniques – Techniques to improve lung volume; techniques to reduce the work of breathing and techniques to clear secretions.
15. Physiotherapy management for common conditions in the ICU
16. Poisoning, Drug overdose, and Drowning.
17. Physiotherapy management following general Medical & Surgical conditions
18. Physiotherapy management of peripheral vascular disorders
19. Exercise testing, planning and prescription: aerobic and anaerobic exercise training.
20. Respiratory Pharmacology
21. Physiotherapy management in Obstructive and restrictive lung disorders
22. Pulmonary Rehabilitation
23. Physiotherapy management following congenital and acquired heart diseases
24. Cardiac rehabilitation – Conservative and post-operative management.
25. Physiotherapy modalities used for wound healing
26. Exercise Prescription for health promotion and fitness for special populations- DM, Obesity, IHD, COPD, HTN
27. C.B.R in Cardio-vascular and respiratory conditions.
28. Recent advances in Cardio respiratory physiotherapy.

COMMUNITY PHYSIOTHERAPY -
1. Health and Illness; Levels of Healthcare & Fitness
2. Basic Concepts of rehabilitation and foundations of rehabilitation
3. Institute based rehabilitation services and multi-disciplinary approach.
4. Methodology of CBR with reference to National Health Delivery system.
5. Role of National Institutes, District Rehabilitation Centre and Primary Health Centre (with appropriate exposure).
9. Role of Non-Government organizations in CBR.
10. Scope of community physiotherapy.
12. Physical fitness, stress management through yoga and psychosomatic approaches.
13. Home exercise programs for various classifications of disabilities.
14. Physiotherapist as a Master Trainer in CBR.
15. Physiotherapy in maternal and child health care.
16. Evaluation and theories of aging; Assessment of the elderly; Exercise prescription for he elderly; Psychosocial and safety issues in elderly
17. Geriatric Rehabilitation
18. Holistic physiotherapy for the aged.
19. Occupational Health, Occupational Hazards, Industrial Hygiene, Vulnerable workers group and labor law;
20. Industrial therapy, Injury prevention and returning the worker to productivity
21. Ergonomics, Principles, Issues related to hand tools, posture, material handling and lifting
22. Prevention of work related Injuries and redesigning workspace, Designing auditory and visual displays for workers; Occupational stress; Environmental Pollution – nose, vibration etc.
23. Physiotherapy role in industry – preventive, intervention, ergonomic and rehabilitative.
24. Women’s, Health : Women’s reproductive health and health care; Exercise prescription in pre and post- natal stage;
25. Diagnosis and treatment of musculoskeletal pain and dysfunction during pregnancy and post menopause.
26. Treatment of Incontinence and Pelvic floor dysfunction; Special problems related to women.
27. Recent Advances in Community Physiotherapy.

**PAEDIATRICS**
1. Normal motor development (development during Prenatal, Infancy, and childhood)
2. Reflex maturation.
5. Genetic basis of paediatric disorders. Embryology & genetic counseling.
8. Clinical symptomatology and patho-physiology of locomotor and cardiopulmonary disorders.
9. Growth and development of a child and its disorders
10. Maturational, Pathophysiological and recovery process in the CNS.
11. Assessment of progressive locomotor disorders – Neuropathic and Myopathic.
12. Early intervention- high risk babies, Neonatal care and management
13. Management of congenital locomotor disorders including the prosthetic and orthotic management.
15. Management of neuro pediatric patients.
17. Disorders of perception and sensory integration.
18. Integrated approach in management of pediatric disorders.
19. Pediatric surgeries and its post-operative management.
22. Sports and fitness in paediatrics.
23. CBR in pediatric conditions.
24. Recent Advances in the Pediatric Physiotherapy

**OBSTETRICS AND GYNAECOLOGY**
1. Anatomy and Physiology of female reproductive system.
2. Biomechanics and patho-mechanics of spine, female pelvis, posture, movement and gait.
3. The Adolescence Female-. Puberty and menarche.
5. Evaluation of maternal musculoskeletal disorders and adaptation of the mother to the changes.
6. Physical fitness assessment - Anthropometrics measurements, range of motion, muscle strength, endurance and skills, body composition, cardiac efficiency tests and spirometry.
8. Antenatal physiotherapy management –Assessment, exercise protocol, health promotion.
9. Guidelines for exercising during pregnancy, manual therapy, breathing exercises, core stability training, trigger point release, pain management, pilates, aerobics, massage therapy.
10. Physiotherapy assessment and management for women with special needs like adolescent mothers, older primipera, auto immune disease, multiple sclerosis.
11. Physiotherapy management for labour, OBG transcutaneous electrical stimulation.
13. Stress and relaxation during pregnancy, relaxation techniques, visualization, imagery, massage, breathing etc.
15. Physiotherapy management in psychological and emotional changes through antenatal period, childbirth, and postnatal period.
17. Physiotherapy management for Breast engorgement and episiotomy.
19. Physiotherapy management for Gynecological disorders- Infective conditions, Cysts and new growths, displacements, endometriosis, genital prolapse, dysmenorrhrea, premenstrual dysphoric disorder and psychosexual problem, Fitness testing and exercise prescription in gynecological conditions (infertility, PCOD, Obesity), Electrotherapeutic modalities in Gynaecological conditions.
20. Evaluation and physiotherapy management for women with physical disabilities and psychological effects of disability and gynaecologic problems in Female athletes.
21. Pre-operative and postoperative physiotherapy management for Gynaecological Surgeries.
23. Evaluation and Physiotherapy management for Osteoporosis, breast oncology and lymphoedema.
24. Yoga in obstetrics and gynecology physiotherapy.
25. Recent Advances in obstetrics and gynecology physiotherapy.

RESIDENCY PART –III + IV

In the residency the professional is expected to work and contribute in the physiotherapy in different units.

DISSERTATION:

Each candidate will have to carry out of a dissertation on the related subject. The dissertation will be guided by one or two members of the faculty of physiotherapy of the department. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean/Principal’s office with the result. The dean/Principal’s office will send the dissertation to the library for record.
Skills based outcomes and monitorable indicators for Master of Physiotherapy

Competency Statements

1. Analyse and discuss the biomedical, behavioural and social science bases of physiotherapy and integrate the bases into physiotherapy practice.
2. Collects assessment data relevant to the client’s needs and physiotherapy practice.
3. Be able to conduct the patient evaluation and assessment as per condition.
4. Assess, analyse, and plan physiotherapy management.
5. Apply and evaluate physiotherapy management.
6. Advise patient on appropriate nutrition, exercises, rest, relaxation other issues.
7. Demonstrate professional practice.
8. Demonstrate autonomous physiotherapy practice.
9. Demonstrate the ability to search and retrieve scientific literature.
10. Demonstrate an understanding of research methods.
11. Demonstrate the ability to critically analyse scientific literature.
12. Prepare Report findings of critical analysis in a scientific format.

<table>
<thead>
<tr>
<th>S. no.</th>
<th>Learning outcomes</th>
<th>Knowledge/comprehension</th>
<th>Applications / synthesis /evaluation</th>
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<tbody>
<tr>
<td>1.</td>
<td>Analyse and discuss the biomedical, behavioural and social science bases of physiotherapy and integrate the bases into physiotherapy practice.</td>
<td>• Be familiar with normal &amp; abnormal patterns of human development and movement. • Understand the anatomical framework of the human body including major systems and aspects of the social, cultural, psychological, environmental, spiritual and belief systems influencing human development. • Able to understand the concept of health &amp; its contribution to wellness.</td>
<td>• Analyse normal and abnormal patterns of human development and movement. • Demonstrate understanding of structural and functional anatomy. • Identify anatomical structure from surface landmarks. • Describe the normal physiological process and the changes throughout the life span. • Analyse basic human movement. • Evaluate the significance of healthy lifestyles for patients/clients.</td>
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<tr>
<td>2.</td>
<td>Collects assessment data relevant to the client's needs and physiotherapy practice.</td>
<td>• Informs the client of the nature and purpose of assessment as well as any associated significant risk.</td>
<td>• Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment. • Monitors the client’s health status for significant changes during the course of assessment and takes appropriate actions as required. • Perform assessment procedure safely and accurately, taking into account client consent, known indications, guidelines, limitations and risk-benefit considerations.</td>
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<tr>
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</table>
| 3.    | Be able to conduct the patient evaluation and assessment as per condition. | • Be familiar with different assessment techniques.  
• Able to examine higher motor functions, cranial nerves, ROM, MMT, Muscle tightness, muscle tone, myotome, sensory evaluation, balance, coordination, hand function, functional outcome measures, Physical fitness, cardio-respiratory evaluation, posture & gait.  
• Be familiar with special tests.  
• Basic knowledge on radiological findings & other investigations.  
• Demonstrate clinical reasoning with choice of assessment and examination procedures | • Perform patient assessment technique to know the condition and to gather information about his/her ailment.  
• Safely and accurately examines and re-examines a patient using standardized measures.  
• Apply pertinent tests and measurements.  
• Interpret all assessment findings to allow for identification of the patient’s/ client’s impairments, activity limitations and participation restrictions.  
• Interpret findings and reach a differential diagnosis  
• Establishes a diagnosis for physiotherapy, identifies risks of care, and makes appropriate clinical decisions based upon the examination, evaluation and current available evidence. |
| 4    | Assess, analyse, and plan physiotherapy management | • Identify the principles of assessment, clinical reasoning, problem identification, goal setting, treatment planning.  
• Be familiar with different assessment techniques and protocols.  
• Know the protocols used in the department.  
• Justify treatment choices with a sound pathophysiological rationale’ | • Develop rapport to obtain history, current health status and previous functional abilities.  
• Interpret the patient’s/ client’s verbal and non-verbal responses.  
• Determines the personality traits and Analyze how the differences in personality influence approach  
• Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment. |
| 5.   | Apply and evaluate physiotherapy management | • Know the protocols used in the department.  
• Understand and Prevent/minimise risks and hazards during physiotherapy interventions  
• Establish equipment is within safety check time frames.  
• Demonstrate knowledge of emergency procedures | • Demonstrate safe, effective and efficient interventions.  
• Evaluate the effectiveness of the Interventions |
<p>| 6    | Advise patient on appropriate nutrition, | Explain the impact of exercise and nutritional status of patient | Assess the patient’s status after exercise and proper diet. |</p>
<table>
<thead>
<tr>
<th>S. no.</th>
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<th>Knowledge/comprehension during treatment</th>
<th>Applications / synthesis /evaluation</th>
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<tbody>
<tr>
<td>7.</td>
<td>Demonstrate professional Practice.</td>
<td>• Demonstrate attitudes and behavior acceptable to society and the profession</td>
<td>• Demonstrate professional behavior.</td>
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<td>• Practise in accordance with the Standards of Ethical Conduct</td>
<td>• Demonstrate safe Practice Plan and show evidence of Professional development.</td>
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<td>• Explain the health and safety issues for patients and staff</td>
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<td>• Able to deliver safe, effective and timely physiotherapy interventions</td>
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<td>• Recognizes risk &amp; hazards which can happen during intervention.</td>
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<td>• Ability to reflect and evaluate own practice</td>
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<td>• Modify and adapt professional practice in response to evaluation</td>
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<td>8.</td>
<td>Demonstrate autonomous physiotherapy practice</td>
<td>• Recognize the critical conditions of patients</td>
<td>• Independently assess and treat patients with single or multiple problems which needs physiotherapeutic intervention.</td>
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<td>• Be familiar with current literature and evidence based best practice</td>
<td>• Demonstrate an ability to refer to other health professionals when beyond the scope of physiotherapy</td>
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<td>9.</td>
<td>Demonstrate the ability to search and retrieve scientific literature</td>
<td>• Define search terms Knowledge on available data search resources Identify relevant sources of Research</td>
<td>• Develop and modify search strategies appropriately complete searches using relevant and available resources such as electronic data bases.</td>
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<td>• Discuss different methods of statistical analysis in relation to different research designs.</td>
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<td>• Discuss the possible ethical implications and requirements in health research</td>
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<td>10.</td>
<td>Demonstrate an understanding of research methods.</td>
<td>• Have a basic understanding of the value of different research paradigms to physiotherapy research.</td>
<td>• Describe appropriate research methodologies that may be used to examine a variety of research questions.</td>
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<td>• Demonstrate a basic understanding of research processes.</td>
<td>• Describe the key elements of research design.</td>
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<td>• Understand the ethics of the</td>
<td>• Describe different methods of data Collection.</td>
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<td>• Demonstrate knowledge of basic</td>
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<td>research process including plagiarism and consent</td>
<td>biomedical statistics</td>
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</tbody>
</table>
| 11    | Demonstrate the ability to critically analyse scientific literature | ● Identify appropriate criteria to assess quality of different types of literature. | ● Demonstrate an understanding of the process of critical review.  
● Demonstrate the use of an appropriate critiquing tool to guide interpretation.  
● Critically analyse an appropriate selection of scientific papers |
| 12    | Prepare Report findings of critical analysis in a scientific format | ● Be familiar with different writing format depending on the research methodology.  
● Be familiar with different referencing styles.  
● Knowledge on presentation methods.  
● Integrate the current literature into physiotherapy practice | ● Use standardized writing format  
● Cite references using a recognized scientific method  
● Demonstrate an ability to synthesise information from several resources  
● Demonstrate the ability to communicate research findings using a variety of presentation methods.  
● Critique current physiotherapy practice with reference to contemporary research literature |
Chapter 5
Job description
Chapter 5: Job Description for all levels

A brief overview of the proposed job description is mentioned below for various levels, however this may be customized based on different work settings.

Level 6
- Patient identification and verification of the patient and assisting in treatment implementation.
- Basic knowledge in Physiotherapy protocol
- Treatment preparation
- Data entry including treatment recording
- General knowledge pertaining to biomedical waste disposal
- Familiarization with physiotherapy equipment
- Knowledge of patient transport and physiotherapy equipment management.
- Physiotherapy Equipment preparation for the simulation and treatment
- Basic Knowledge of exercise therapy and electrotherapy and its implementation.
- Information management / communication for interdisciplinary
- Supervision of the physiotherapy procedure, health and safety
- Professional responsibility including quality check on treatment delivery, chart verification
- Special procedures for treatment and assessment including MMT, different mobilization etc.

Level 7
- Professional developmental skill
- Special manipulation treatment skill
- Ability to critically evaluate practice
- Verifies the accuracy of the patient physiotherapy procedure before and after the treatment
- Monitors the patients for clinical reaction for all the patients

Level 8
- Consult and discuss with appropriate health physicians when immediate clinical response is necessary based on emergency and for critical patient condition.

Level 9
- Standardizing the teaching skills and developing a curriculum for the teaching program.
- Involvement in research and development

Level 10
- Setting the guidelines
- Judgment on all aspects of physiotherapy work
- Protocol development on treatment delivery and Quality Assurance
- Involvement on departmental up gradation programme
- Assesses service procedure and environment to meet established guidelines for proper working and adjust the action plan as per clinical compliance
Allied and Healthcare Professions

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

The wide variation in the understanding of the concept of allied and healthcare professional, better known as ‘paramedic’, the nomenclature, and functions has led to the poor image of allied and healthcare sciences in India. The use of the word paramedic itself limits the activities of AHPs in the system. Hence, it is imperative to adequately compensate these professionals based on their qualifications and specialties. Despite a huge demand for services from this sector, allied and healthcare sciences is highly fragmented. As per the report ‘From Paramedics to Allied Health Sciences’, in total 138 courses of varied levels were identified during the process. Although it is estimated that there may be many more courses which are yet to be identified.

Considering the lack of regulatory mechanism following 15 core professional groups (accounting for around 44 professions) has been enlisted below. (The list is illustrative of the allied and healthcare professions. In future there may be addition or removal of certain professions based on the state of their regulation and standardization). It also needs a mention that most of these professions are not restricted to the professional groups under which they have been categorized, their role may extend to other professional services too. Similarly, the categorization is an indicative categorization, however this may evolve over time based on deeper understanding of the roles and responsibilities of each professional group:

1. **Healthcare Professions**
   1. Optometry
   2. Physiotherapy
   3. Occupational Therapy
   4. Nutrition Sciences
   5. Physician Associate and Assistants

2. **Allied Health Professions**
   6. Cardiology, Vascular and Pulmonary Technology
   7. Medical Laboratory Sciences
   8. Medical Radiology and Imaging Technology
   9. Neurosciences Technology
   10. Non- direct and Administrative services
   11. Primary Care and Community services
   12. Radiation Therapy
   13. Renal Technology
   14. Surgical and Anesthesia related Technology
   15. Trauma Care Services
The above mentioned groups account for over 44 job profiles in the allied and healthcare space, which are as follows-

A. **Healthcare Professions**

1. Optometry  
   a. Optometrist
2. Physiotherapy  
   a. Physiotherapist
3. Occupational Therapy  
   a. Occupational Therapist
4. Nutrition Sciences  
   a. Nutritionist  
   b. Dietitian
5. Physician Associate and Assistants  
   a. Physician Associates and Assistants

B. **Allied Health Professions**

6. Surgical and anesthesia related technology  
   a. Anesthesia Assistants and Technologist  
   b. OT Technologist  
   c. Endoscopy Technologist
7. Medical Laboratory Sciences  
   a. Cyto-Technologist  
   b. Dermatology/STD/Leprosy Lab Technologist  
   c. Forensic Technologist  
   d. Hemato-Technologist  
   e. Histopath-Technologist  
   f. Phlebotomist  
   g. Medical and Clinical Lab Technologist
8. Medical Radiology and Imaging Technology  
   a. Radiographer  
   b. Radiologic/Imaging Technologist  
   c. Diagnostic Medical Sonographer
9. Renal Technology  
   a. Urology Technologist  
   b. Dialysis Therapy Technologist
10. Radiation Therapy  
   a. Radiotherapy Technologist  
   b. Medical Dosimetrist  
   c. Nuclear Medicine Technologist
11. Trauma Care Services  
   a. Emergency Medical Technologist (paramedic)  
   b. Critical Care/ICU Technologist
12. Neurosciences Technology  
   a. EEG/END Technologist  
   b. EMG Technologist
c. Neuro Lab Technologist
d. Sleep Lab Technologist

13. Cardiology, Vascular and Pulmonary Technology
   a. Cardiovascular Technologist
   b. ECG Technologist
   c. ECHO Technologist
   d. Perfusionist
   e. Pulmonary Function (PFT) Technologist
   f. Respiratory Therapist

14. Non-direct and Administrative Services
   a. Biomedical Engineers and Technologist
   b. Medical Assistant
   c. Medical Secretaries
   d. Medical Transcriptionist
   e. Health Information Management Technologist

15. Primary Care and community services
   a. Blood Bank Technologist
   b. Counselor- Integrated Behavioral Health Counselors, Palliative counselors etc.
   c. Sanitary Health Inspectors
References

23. Bachelor of Physiotherapy Syllabus, Rajiv Gandhi University of Health Sciences. 4th T Block, Jayanagar, Bangalore.
24. Syllabus for Bachelor of Physiotherapy (b.p.th.), Degree course. MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK.
25. Master of Physiotherapy Syllabus, Rajiv Gandhi University of Health Sciences. 4th T Block, Jayanagar, Bangalore.
DETAILS OF INVOLVED/RESPONSIBLE OFFICERS AT THE MINISTRY OF HEALTH AND FAMILY WELFARE (MOHFW)

1. Mr Ali R. Rizvi, Joint Secretary (Human Resource)
2. Mr B. Sriramachandra Murthy, Director (Allied Health Section)
3. Mr Satish Kumar, Under Secretary (Allied Health Section)

National Initiative for Allied Health Sciences – Technical Support Unit (NIAHS – TSU)

1. Ms Kavita Narayan, FACHE, Director, NIAHS-TSU at MoHFW, GoI
2. Ms Shivangini Kar Dave, Project Lead Coordinator
3. Ms Natasha D’Lima, Program Coordinator
4. Ms Namita Gupta, Consultant
5. Mr Sutirtha Mazumder, Senior Research Assistant
6. Mr Ashish Arora, Senior Research Assistant (former)
7. Ms Tanu Sri Sahu, Senior Research Assistant
8. Mr Akhilendra Trivedi, Senior Research Assistant
9. Mr Vivek Bhatnagar, Senior Research Assistant
10. Mr Anirooddha Mukherjee, Research Assistant

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