

**National Commission for
Allied and Healthcare Professions**

**Health Care Section
Ministry of Health and Family Welfare**

PHYSIOTHERAPY HANDBOOK

CURRICULUM & RULES AND REGULATIONS

BACHELOR OF PHYSIOTHERAPY AND MASTER OF PHYSIOTHERAPY

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Chapter 1

Introduction to the Handbook

Chapter 1: Introduction to the Handbook

The National Physiotherapy Curriculum Handbook is an up gradation and revision of the Model Curriculum Handbook on Physiotherapy by Allied Health Section, Ministry of Health and Family Welfare, Government of India that was published in 2017. On March 28, 2021, the National Commission for Allied and Health care professions bill was passed by the Parliament of India and an Interim commission was set up for National commission for allied and health care profession act under the rules notified by the central government on 27th May 2021. The commission with the preamble to provide for regulation and maintenance of standards of education and services by allied and healthcare professionals, assessment of institutions, maintenance of a Central Register and State Register and creation of a system to improve access, research and development and adoption of latest scientific advancement and for matters connected therewith or incidental thereto initiated the process of drafting the standardization of the curriculum in physiotherapy education throughout the nation.

Who is a Healthcare Professional?

The National commission for allied and health care professions act defines the healthcare professionals as:

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

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.¹ 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 “healthcare professionals”. In the healthcare system, statutory bodies exist for clinicians, nurses, pharmacists and dental practitioners; but a regulatory structure for around 50 professions was absent in India. Currently, the Parliament of India has enacted the National commission for allied and healthcare professions act 2021 to put these 56 professions under the ambit of the allied and healthcare system.

The act defines Physiotherapists as healthcare professionals due to their nature of duties and responsibilities and numbers of hours of training at entry level qualification that is Bachelor of Physiotherapy, which is much more than 6000 hours spreaded over Five years including one year of rotatory clinical internship.

The marked variance in education and training practices in physiotherapy courses offered by institutions across the country prompted the commission to envisage the creation of national guidelines for education and career pathways of physiotherapy professionals, with a structured curriculum based on skills and competencies. Thus, this handbook has been designed to familiarize the universities, colleges, healthcare providers as well as educators offering physiotherapy courses with these national (minimum) standards.

This hand book of Minimum Standards in curriculum of Physiotherapy aims to minimise the variation in education by comprising of a standardized curriculum, career pathways, nomenclature and other details for physiotherapy profession. The change from a purely didactic approach will create better knowledgeable and clinically skilled professionals and will improve the quality of overall patient care. This handbook can also guide thousands of young students who choose Physiotherapy as a healthcare profession, to play an equally important role in delivery of healthcare to the society.

Scope and need for Physiotherapy 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 and deliver healthcare services independently using sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis and management is now so dependent on technology, that healthcare professionals are vital to successful healthcare delivery.

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 healthcare professionals in the healthcare system are still unexplored in India. Although an enormous amount of evidence suggests that the benefits of healthcare professionals 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 healthcare professionals in the system, such as in the case of stroke survivors, it is the support of physiotherapists that significantly enhance their management and early return to normal life. (Ref. National guidelines for prevention and management of stroke)Physiotherapists also play a significant role in

managing the patients who struggle mentally and emotionally in the current challenging environment and require mental health support; and help them return to their well-being maximallyⁱⁱ People of all age groups with mobility difficulties, sports persons, pregnant women, persons with soft tissue injuries, post-surgical cases, patients with cardiac and pulmonary ailments, the elderly, cancer patients, patients

with long term conditions such as diabetes people with neuropathic pain and amputees, and those suffering from other life style disorders; the list of people and potential patients who benefit from physiotherapy is indefinite.

Thus, the breadth and scope of the physiotherapy 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 physical dysfunction/ problems resulting from systemic illnesses, diseases, disorders or trauma
- Towards health promotion and disease prevention
- Assessment, diagnosis, management and evaluation of interventions and protocols for treatment;
- In a broad range of settings, from a patient's home to community, health care facilities including those in the educational institutions and corporate/industrial set up, 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 Physiotherapy 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. Independent Clinical Practice
2. Communication
3. Member 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. Independent Clinical Practice

Using a patient/family centered approach and best evidence, each student will learn to 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
- Develop competency for autonomous practice of physiotherapy as first hand practitioners.
- Prescribe and use relevant investigations, therapeutic interventions, assistive devices, home and work place modifications, support systems etc. as needed
- Identify the indications of physiotherapy for various disease, disorders and trauma and manage them in an appropriate manner with physiotherapeutic modalities.
- Assessment of patients and identifying the need for appropriate referral to other medical specialties.
- 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^{4, 1}

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 best interests of the patients and the society in general
- 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 so that the team prioritizes and continuously refines its communication channels creating an environment of general and specific understanding.
- 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 methods for all forms of written and verbal communication including accurate and timely record keeping
- Assess his/her own communication skills, develop self-awareness and be able to improve his/her relationships with others
- Possess skills to counsel for lifestyle changes and advocate health promotion

3. Membership of a multidisciplinary health team²

The student will learn to 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 learn to:

- Recognise, 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 optimises 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 prioritises and continuously refines its communication channels creating an environment of general and specific understanding

² Pamela Mitchell et al. Core principles and values of effective team based healthcare 2012. Available from: <https://www.nationalahec.org/pdfs/VSRT-Team-Based-Care-Principles-values.pdf>.

- Recognise 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 the 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 learn to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognise 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-care provider relationships
- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

5. Commitment to professional excellence³

The student will execute professionalism to reflect in his/her thought and action through a range of attributes and characteristics that include professional 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 learn 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 scope/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 mentorship⁴

The student must learn to take on a leadership role where needed in order to ensure clinical outcomes and patient satisfaction. They must be able to respond in an autonomous and confident manner to predicted and unpredicted situations, and should be able to manage themselves and with other team members effectively. They must create and maximise opportunities for the improvement of the health seeking experience and delivery of healthcare services. Program objectives should enable the students learn to:

- Act as agents of change and be leaders in quality improvement and service development, so that they contribute and enhance peoples' wellbeing and their healthcare experience
- Systematically evaluate care; ensure the use of these findings to help improve peoples' 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
- Recognise 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 physiotherapeutic healthcare safely, manage risk and remain accountable for the care given; actively involve and respect others' contribu-

⁴ Nursing & Midwifery Council .Standards for competence for registered nurses. Available from: <http://www.nmc-uk.org/Documents/Standards/Standards%20for%20competence.pdf>.

tions 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, care givers and if needed, 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 Responsibility⁵

The students will recognise that the healthcare professionals need to be advocates within the health care system, to judiciously manage resources and to acknowledge their social accountability.⁶ 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 learn to:

- Demonstrate knowledge of the determinants of health at local, regional and national levels and respond to the population's health 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 will 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 organisations.
- Advocate for the services and resources needed for optimal patient care

8. Scientific attitude and Scholarship¹⁰

⁵ Social Accountability- A vision for Canadian medical schools Available from: https://www.afmc.ca/fmec/pdf/sa_vision_canadian_medical_schools_en.pdf. 9

⁶ University of Manitoba. Faculty of medicine teaching handbook2004. Available from: umanitoba.ca/faculties/medicine/media/teaching_handbook04.doc.

The student will utilise 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 & dissemination of research knowledge; for their application to teaching encounters.

9. Lifelong learning

The student will learn to 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, mentor's guidance and by 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 physiotherapy education

Competency-based curriculum

A significant skill gap has been observed among 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 each student 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 program largely depends on the curriculum design that is being followed. With emerging medical and scientific knowledge, educators have realised that learning is no more limited to memorising 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; **the 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.⁷

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

⁷ Sherwin J. Competency-Based Medical Education Takes Shape¹¹2011. Available from: https://www.aamc.org/newsroom/reporter/april11/184286/competency-based_medical_education.html.

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 leaning strategies and evaluating learning outcomes (Knowles, 1975).⁸

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.⁹ Lifelong, self-directed learning (SDL) has been identified as an important ability for medical graduates (Harvey, 2003)¹⁰ and so is applicable to physiotherapy professionals. **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

⁸ Brookfield, S. D. Self-Directed Learning In: YMCA George Williams College ICE301 Lifelong learning Unit 1 Approaching lifelong learning. London: YMCA George Williams College; 1994.

⁹ Ramnarayan K, Hande S. Thoughts on Self-Directed Learning in Medical Schools: Making Students More Responsible 2005. Available from: <http://education.jhu.edu/PD/newhorizons/lifelonglearning/higher-education/medical-schools/>.

¹⁰ Harvey, B. J., Rothman, A. I., Frecker, R.C. Effect of an undergraduate medical curriculum on students' self-directed learning. Academic Medicine. 2003; 78(12): 1259-65.

system to measure a learner's performance.¹¹ 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, now a need exists for the use of a fully convertible credit-based system that can be accepted at other universities. It has now become imperative to offer flexible curricular choices and provide learners mobility due to the popularity of initiatives such as 'twinning programs', 'joint degrees' and 'study abroad' programs.¹²

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 has been converted into credit hours as per the norms of National Credit Framework India where 1 credit hour is equal to 15, 30 and 45 hours of class room teaching, practical and clinical and field work respectively

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, 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.¹³

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

¹¹ Credit-Based-Grading-System for Assessment of Students. Available from: http://www.presiuniv.ac.in/web/exam_assessment.php.

¹² Manual on semester based, credit and grading system Mumbai: University of Mumbai 2011. Available from: http://www.mu.ac.in/1_Manual_SCGS_Arts_09-06-2011.pdf.

¹³ Vertical Integration 2015. Available from: <http://www.mcw.edu/Medical-School/Curriculum/Traditional-Curriculum/Vertical-Integration.htm>.

devoted to basic and laboratory sciences (integrated with their clinical relevance) would be the maximum in the first year, progressively decreasing in the second, third and fourth year of the training, making clinical exposure and learning more dominant.¹¹

Learning methodologies

With the 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.

Introduction of foundation course in the curriculum

The foundation course for healthcare professions is an immersive program designed to impart the required knowledge, skills and confidence for seamless transition to the second semester of a professional healthcare course. Post admission, the foundation course is designed for a period of 6 months to prepare a student to study the respective 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. 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.

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 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 the students and professionals of healthcare professions. 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 of 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. (Ref. The report '*From Paramedics to Allied Health: Landscaping the Journey and way ahead*',)

Table 1 Clinical learning opportunities imparted through the use of advanced technique

Teaching modality	Learning opportunity examples	
Patients	Teach and assess in selected clinical scenarios	
	Practice soft skills of assessment, diagnosis and interventions	
	Practice physical examination and assessment	
	Assessment of physical dysfunction, movement pattern, gait, balance, posture, activity level etc. for diagnosis and prescription	
	Application of Physiotherapeutic modalities and therapeutic exercises	
	Receive feedback on performance	
Mannequins	Perform acquired techniques	
	Practice basic procedural skills	
	Apply basic science understanding to clinical resolutions.	
Simulators	Practice teamwork and leadership	
	Perform cardiac and pulmonary care skills	

	Apply basic science understanding to clinical problem solving	
Task under trainers	To learn assessment, investigations, diagnosis, and physiotherapeutic interventions including application of exercise therapy & electrotherapy modalities, measurement of muscle strength, joint range of motion, Joint mobilisation, manipulation, chest physiotherapy, functional activities, posture, gait pattern, balance, coordination, associated physical interventions etc.	

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

Physiotherapy teachers should use these tools during assessment and evaluation of competencies of physiotherapy students. It tests the performance and competence in communication, clinical examination, clinical evaluation, physical & functional diagnosis, procedures, prescriptions and patient management. For example, electro diagnosis, biomechanical and physical diagnosis, investigations, exercise prescription, prescription of assistive device, support system prescription, joint mobilization, manipulation techniques etc.; and interpretation of results. The basic essential elements consist of functional analysis of the ability to assess physical fitness, occupational roles, disability evaluation etc. and 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 by 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 physiotherapy education system.



Chapter 2

Methodology of Curriculum Development

Chapter 2: Methodology of curriculum development

Interim commission for Allied and health care professions constituted three committees to streamline the standardisation of education, practice and development of allied and healthcare professions. Committee 3 was given the responsibility to standardise the curriculum of these professions. A model curriculum handbook for Physiotherapy was developed and published by Ministry of Health and Family welfare in year 2017 with a view to uniformly standardise the curriculum of undergraduate and postgraduate education of Physiotherapy in India. This handbook served as baseline for upgradation and revision considering technological advancements, global updates, to match the global standards in field of physiotherapy education and practice. This will facilitate the exchange of professional expertise to and fro and will enhance the availability of physiotherapeutic management as per the international standards and guidelines. The commission sought opinion of the professional experts in the field of academics, practice and research from leading government and private institutions, all over India to constitute a task force committee for physiotherapy. These people served as subject experts and redesigned the curricula based on a standardized framework. The commission issued guidelines for the task force committee to revise and recommend the updated guideline regarding education and practice of physiotherapy in India.

A series of meeting (both online and offline) involving subject experts and officials from the commission were organized at National Institute of health and Family welfare, Munirka New Delhi and All India Institute of Medical Sciences, New Delhi to accomplish the task.

The task force sought curricula from various universities and institutions across the country and abroad and did a comprehensive literature review resulting in a detailed curriculum of the physiotherapy undergraduate and postgraduate course, 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. A consensus was build up amongst the task force committee members to include or discard various suggestions by the members and literature review. The versatile and immense experience of task force members in their respective streams, to assess the applicability of the curricula drafted in view of the healthcare system as a whole will be a milestone in standardisation of Physiotherapy education in India.

Chapter 3

Background of the profession

Chapter 3: Background of the profession

Statement of Philosophy– Why this profession holds so much importance¹⁴

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 skilful examination and evaluation regardless of the cause or etiology and provide skilled therapeutic intervention to foster improvement in physical functioning and maximising 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 physiotherapeutic management of disorders, diseases and trauma. They combine their in-depth knowledge of the human body and how its functioning with specialised hands-on clinical skills to assess, diagnose and treat physical dysfunctions due to disorders, illness, injury/trauma or disabilities.

All physiotherapists registered to practice are qualified to provide safe and effective physiotherapeutic management. They have met national entry-level education and practice standards, and have successfully passed a standardised 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 baccalaureate degree in Physiotherapy.

Physiotherapy is an essential part of the health and community/welfare services delivery system. Physiotherapists practice independently and also as part of the multidisciplinary rehabilitation/habilitation team, prescribe and implement therapeutic programs to gain, maintain or restore optimal function and quality of life in patients/ individuals with loss and disorders of movement/ functions, after necessary assess-

¹⁴ Samuel Merritt University. Available from: http://www.samuelmerritt.edu/physical_therapy/philosophy.

ment, evaluation and investigations. Physiotherapists also work for well-being of individuals and the general public/society, emphasising the importance of physical activity and exercise.

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, emphasising the importance of physical activity and exercises.
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. Assessing/ evaluating, prescribing necessary investigations to establish diagnosis for physical dysfunction, prescribing physiotherapeutic interventions/treatment plan to the patients/individuals seeking their opinion/guidance regarding their health issues
4. 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 due to diseases, disorders and trauma.
5. 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 facilities/ programs
2. Community health settings including primary health care centers, individual homes, and field settings
3. Education and research centers
4. Fitness clubs, health clubs, gymnasias and wellness centres
5. Hospices

6. Hospitals
7. Nursing homes
8. Occupational health centers
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/ corporate settings
18. Integrated medical centres
19. Women's health centre

Recognition of Title and qualification

Within the multidisciplinary health professionals' team, the professional responsible for administering physiotherapy treatment/ management are recognized as physiotherapist. Physiotherapists at times referred as Physical therapists. The terminology Physiotherapist is an internationally adopted nomenclature and thus should also be applicable in an Indian context. **The commission recognizes any person as Physiotherapist who has acquired Bachelor of Physiotherapy from recognized university and who is eligible to be enrolled as physiotherapist in the register of physiotherapists maintained by the commission.**

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/ profession. 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 start with NSQF 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.

NSQF Levels	Clinical (Designation)	Academic (Designation)	Research (Designation)	Level in pay Matrix**	Eligibility & Experience (For Promotion)	Eligibility & Experience (For Direct recruitment)	Annual performance based appraisal
NSQF Level 6	Physiotherapist	Tutor/ Demonstrator	Scientist B	10	Fresh BPT	• Fresh BPT	• Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year
NSQF Level 7	Senior Physiotherapist	Assistant Professor	Scientist C	11	<p>For Clinical, Five years of experience as Physiotherapist (BPT)</p> <p>For Research, Five years of experience as scientist B</p> <p>MPT is mandatory for promotion to Scientist C</p> <p>For Academic MPT [Fresh]</p>	<p>• For Clinical, MPT</p> <p>For Academic MPT [Fresh]</p>	<p>• Proficiency test CR, self-appraisal & HOD /Principal's Appraisal/year</p> <p>• 2 Conference presentation</p> <p>• 1 publication during tenure period</p>

NSQF Levels	Clinical (Designation)	Academic (Designation)	Research (Designation)	Level in pay Matrix**	Eligibility & Experience (For Promotion)	Eligibility & Experience (For Direct recruitment)	Annual performance based appraisal
NSQF Level 8	Superintendent Physiotherapist	Assistant Professor (Senior scale)	Scientist D	12	<p>For Clinical, Five years' experience in the post of senior physiotherapist MPT is mandatory for promotion to Superintendent Physiotherapist</p> <p>For Academic</p> <p><u>Three years of experience as Assistant professor</u> Ph.D.*** is mandatory for promotion to Assistant Professor (Senior grade) For Research Five years of research experience as Scientist C.</p>	<ul style="list-style-type: none"> • For Clinical, Five years of clinical experience with MPT qualification. • For Academic • <u>Three years of experience as Assistant Professor/</u> • Ph.D.*** is mandatory for recruitment at Assistant Professor (Senior grade) • For Research Five years of research experience as Scientist C. Ph.D. is mandatory for recruitment as scientist D 	<ul style="list-style-type: none"> • Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year • 2 Conference presentation • 2 publications during tenure period • Enrollment for PhD

NSQF Levels	Clinical (Designation)	Academic (Designation)	Research (Designation)	Level in pay Matrix**	Eligibility & Experience (For Promotion)	Eligibility & Experience (For Direct recruitment)	Annual performance based appraisal
NSQF Level 9	Chief Physiotherapist / Deputy Director PT	Associate Professor	Scientist E	<u>13</u>	<p><u>For Clinical</u> Eight years' experience as Superintendent Physiotherapist <u>For Academic</u> Five years of experience as Assistant Professor (Senior Scale)</p> <p>For Research Eight years of experience as Scientist D</p>	<p><u>For Clinical</u> Eight years' experience as Superintendent Physiotherapist <u>For Academic</u> <u>Five years of experience as Assistant Professor</u> (Senior Scale)</p> <p>• For Research Eight years of experience as Scientist D)</p>	<ul style="list-style-type: none"> • Proficiency test CR & Self-appraisal/year • 2 Conference presentation • 3 publications(a s first author) during tenure period

NSQF Levels	Clinical (Designation)	Academic (Designation)	Research (Designation)	Level in pay Matrix**	Eligibility & Experience (For Promotion)	Eligibility & Experience (For Direct recruitment)	Annual performance based appraisal
NSQF Level 10	Director Physiotherapy/ Head of the Physiotherapy Department*	Professor	Scientist F	14	<p><u>For Clinical</u> 5 years' experience as Deputy Director PT/Chief Physiotherapist</p> <p><u>For Academic</u> Five years' experience as Associate Professor, Senior most Professor will be the Principal</p> <p><u>For Research</u> 5 years of experience as Scientist E (Designation as per UGC / ICMR Norms) Scientist D</p>	<p><u>For Clinical,</u> Five years of clinical experience as Deputy Director PT/ Chief Physiotherapist</p> <p><u>For Academic</u> • 5 years of experience as Associate Professor</p> <p><u>For Research</u> • 5 years of experience as Scientist E</p>	<ul style="list-style-type: none"> • 5 • Proficiency test CR, Self appraisal/ year • 3 Conference presentations • 3 publications (as first author) during tenure period

NSQF Levels	Clinical (Designation)	Academic (Designation)	Research (Designation)	Level in pay Matrix**	Eligibility & Experience (For Promotion)	Eligibility & Experience (For Direct recruitment)	Annual performance based appraisal
pro-posed	Assistant Director General [A.D.G]	Principal/Dean	Scientist G /Research Head	15	<p><u>For Clinical</u> 2 years' experience as Director PT</p> <p><u>For Academic</u> Five years' experience as Professor, Senior most Professor will be the Principal</p> <p><u>For Research</u> 5 years of experience as Scientist F (Designation as per UGC / ICMR Norms) Scientist D</p>	<p><u>For Clinical,</u> Five years of clinical experience as Director PT</p> <p><u>For Academic</u> • 5 years of experience as Associate Professor</p> <p><u>For Research</u> • 5 years of experience as Scientist F</p>	<ul style="list-style-type: none"> • 5 • Proficiency test CR, Self appraisal/ year • 3 Conference presentations • 3 publications (as first author) during tenure period

Table 2 Nomenclature based on career progression for Physiotherapist

*** for hospitals/ universities having department of physiotherapy**

**** Pay scales for Clinical, research and academic designations will be same at each NSQF level. E.g. Pay scale of Senior Physiotherapist (Clinical), Assistant Professor (Academic) and Scientist C (Research) at NSQF level 7, will be same.**

***** Ph. D. under any specialty/ discipline in Physiotherapy recognized by U.G.C.**

A minimum of 55 % marks in MPT examinations is required for taking Academic Designation as per UGC Norms or research designation as per ICMR Norm. 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.

- Mandatory Ph.D. will be applicable after five years of implementation of these Rules.
- All Academic Post are full time teaching Post and a teaching experience from Head/ Principal/ Director of a recognized Physiotherapy college or Institution will only be valid for counting any Teaching experience.

Physiotherapists on clinical posts who impart and are responsible for clinical training & supervision of physiotherapy students/ interns will be provided with academic experience by the Head/Principal/ Director of the respective recognized Physiotherapy College or Institution will only be valid.

Definition of Physiotherapists and Physiotherapy

Physiotherapists

Physiotherapy Professional is a person who practices physiotherapy by undertaking comprehensive examination and appropriate investigation, provides treatment and advice to any persons preparatory to or for the purpose of or in connection with movement or functional dysfunction, malfunction, disorder, disability, healing and pain from trauma and disease, using physical modalities including exercise, mobilization, manipulations, electrical and thermal agents and other electro therapeutics for prevention, screening, diagnosis, treatment, health promotion and fitness. The physiotherapist can practice independently or as a part of a multi-disciplinary team and has a minimum qualification of a baccalaureate degree. (NCAHP Act 2021)

Physiotherapy

As per Delhi Council of Occupational therapy and Physiotherapy Act 1997.

Physiotherapy” means physiotherapeutic system of medicine which includes examination, diagnosis, treatment, advice and instructions to any person preparatory to or for the purpose of or in connection with movement dysfunction, bodily malfunction, physical disorder, disability, healing and pain from trauma and disease, physical and mental conditions using physical agents including exercises, mobilisation, manipulation, mechanical and electrotherapy, activities and devices for diagnosis, treatment, prevention and promotion of health.

As Per Maharashtra OT/PT Council Act 2004 and Gujarat Physiotherapy Council Act 2011.

Physiotherapy means a branch of modern medical science which includes examination, assessment, interpretation, physical diagnosis, planning and execution of treatment and advice to any person for the purpose of preventing, correcting, alleviating and limiting dysfunction, acute and chronic bodily malfunction, including life saving measures via chest physiotherapy in the intensive care units, curing physical disorders or disability, promoting physical fitness, facilitating healing and pain relief and treatment of physical and psychosomatic disorder through modulating physiological and physical response using exercises, physical agents, activities and devices including mobilization, manipulations, mechanical, electrical and thermal agents including therapeutic ultrasound and therapeutic LASER and electrotherapy including electrophysiology for diagnosis, treatment and prevention.

Education of the Physiotherapist

When developing any education program it is necessary that program 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, professional expertise and a competency based approach for learning and is designed accordingly. The curriculum is prescriptive and is designed with an aim to standardize the content across the nation.

Entry requirements

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** with Physics, Chemistry, Biology (Min 50% marks) from a recognized university or board which would provide the foundation for and prepare them for higher education studies. Admission shall be on the basis of entrance exam conducted by central agency/ state agency/ university (As applicable). The candidate must have appeared in National eligibility entrance test (NEET).

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 -

- **5 years program (including one year of internship) - Bachelor'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 clinical practice should be started from 2nd year onwards and this should be on a continuum of rotation from theory to practice over the program. The aim of the five year degree program is to enable the development of the PT as an independent health care practitioner as well as a key member of the multidisciplinary team and to enable him/her to execute advanced diagnosis, preparation/planning/delivery/prescription 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.

It is therefore recommended that a separate Guidelines and rules should be framed for Research Degrees in Physiotherapy.

Teaching faculty and infrastructure

Appointment of Physiotherapy teachers, with minimum qualification and experience in various departments of Physiotherapy colleges and institutions imparting graduate and post-graduate medical education is a necessary requirement to maintain a standard of teaching and Passing out Graduates and Post Graduates.

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. The requirement for starting a physiotherapy teaching institution [undergraduate and post graduate] is given as below:

Bachelor in Physiotherapy (B.P.T) program

1. Infrastructural, Functional & Equipment and human resource Requirements

The establishment of a Physiotherapy college– No person shall establish a Physiotherapy college/institute except after obtaining prior permission from the commission.

The following organizations shall be eligible to apply for permission to set up a Physiotherapy college, namely: -

- (1) A State Government/Union territory;
 - (2) A University and Deemed to be University,
 - (3) An autonomous body promoted by Central and State Government by or under a Statute for the purpose of medical education;
 - (4) A society registered under the Societies Registration Act, 1860 (21 of 1860) or corresponding Acts in States; or
 - (5) A public religious or charitable trust registered under the Trust Act, 1882 (2 of 1882) or the WAKFS Act, 1954 (29 of 1954).
 - (6) Companies registered under Company Act may also be allowed to open Physiotherapy colleges.
- (2) Physiotherapy education prepares a person for independent practice and involves extensive clinical training in almost every speciality & superspeciality of modern medicine and all other aspects of health care. Henceforth, new Physiotherapy College/institute can only be established in National Medical Commission (NMC) recognized medical colleges. Notwithstanding New Physiotherapy College to be started in NMC recognized medical college will need to fulfill the entire essential requirement as following. However the institute may share common facilities, faculties and infrastructure with the medical college.

Note: All existing physiotherapy colleges/ institute or A new physiotherapy colleges will impart physiotherapy education provided that following conditions are fulfilled:-

- That Physiotherapy education is one of the objectives of the applicant.

2. LAND AND BUILDING –

a. If the college is in the premises of NMC permitted/ recognized medical college, no separate land is required. Existing norms of land for medical college will suffice. Besides that the constructed area/Building norms for Physiotherapy College must be fulfilled as per the requirement mentioned below. In all other cases, the applicant must provide the land details on which the institution will be established for providing Physiotherapy education. Minimum 10 acre land is required for Physiotherapy College. It should be in the name of society/ trust/company applying for the same (sale deed/lease/gift deed etc.).

- b.. That the applicant Institution / Trust should have a separate independent building for Physiotherapy College and facilities for clinical training as per the curriculum as prescribed by the commission from time to time.
- c. Such a building should be constructed in such a way that there is adequate parking space and recreational area or open space for students as prescribed by the commission.
- d. Such a building should have adequate space and should have out-patient Physiotherapy department, various laboratories as needed, office space, class rooms, hostel and other ancillary facilities.
- e. Minimum exclusive built up area for such a college should be 35,000 sq.ft.
- f. Building should be barrier free accessible to persons with disability and as per NBCI guidelines (National Building Code of India).
- g. Building must be recorded on the appellate institute name or if the land is under lease agreement, it must be for at least 10 years
- h. Building must have requisite clearances from the respective civic and administrative authorities like-Fire NOC, structural stability certificate, land use certificates etc.
- i. . Building must have CCTV camera for CCTV surveillance for every area of common use as can be prescribed.
- j .Biometric facility for students and staff, faculty attendance record/documentation
- k. All buildings with disability friendly and accessible facility

3. PHYSIOTHERAPY Department/ O.P.D:

A well-equipped OPD facility in physiotherapy department with instruments of all specialties like Musculoskeletal, Neurology, Cardio respiratory, sports medicine, Women Health and community physiotherapy should be available at the college premises. A student/ patient ratio of 1:5 should be maintained. In addition to the own Physiotherapy OPD in the college building (in case of the existing institutions) if required, the College can get attachment (through signed MOUs) to maximum 5 Physiotherapy departments/ OPDs in various hospitals with minimum 50 patients OPD workload per day. An out-patient physiotherapy department at the tie-up facility cannot be considered as an independent physiotherapy OPD/ unit of the college. Besides the physiotherapy OPD at the campus, the institute should also start a community / extension centre in nearby rural /semi urban area.

4. HOSPITAL / HOSPITAL ATTACHMENT –

a.If the college is in the premises of MCI/NMC permitted/recognized Medical College as constituent college, then, there is no requirement for attachment of any other hospital.

b.In all other cases Proof of availability of 300 beds own/attached hospital (Government/Private) for clinical training of 60 students shall be furnished (student: Bed ratio of 1:5). The hospital must be within 20 km radius of the College. College must provide mandatory bus service to the students if the hospital is located more than 1 km away from the College. Within 5 years of application of these Rules the colleges must have Own Prescribed Hospital in the college Premises.

c.College can be affiliated to maximum five (05) hospitals having indoor and outdoor facility in the following specialties to have cumulative /total bed strength of 300.

S. N.	Specialties/ Super specialties
1	Orthopedics
2	Medicine including rheumatology, geriatrics and emergency medicine
3	Surgery including plastic surgery and burns
4	Gynecology and Obstetrics
5	Neurology
6	Pediatrics, pediatric surgery and neonatal ICUs
7	Respiratory medicine
8	Cardiology including critical care and cardiothoracic surgery
9	Radiology

10	Neurosurgery
11	Total bed strength = 300

d. Tie up hospitals cannot get attached to more than two colleges. If the affiliated hospital is attached with two colleges, the bed strength must be adequately divided amongst the colleges as per the prescribed student: bed ratio.

e. The affiliated hospital shall provide information regarding any MOU with other colleges, if any & MOU should be for at least five years.

f. The MOU should mention the available clinical specialties, patient loads, and availability of required equipment for clinical training with names and designations of the faculties responsible for the training in the hospital.

g. FACULTY: The college/institute must arrange for physiotherapy faculties for supervision and clinical teaching of students inside the hospital. This can be done either by posting its own physiotherapy faculties in the hospital or making remunerative arrangement for recruiting physiotherapy faculties of the hospital.

h. Hospitals may recruit its faculties of physiotherapy for supervision and clinical training of physiotherapy students and supervision of physiotherapy interns with similar eligibility, pay scales and promotional avenues of physiotherapy institutes.

Space allotment for an annual intake of 60 students of B.P.T.

Sn	Unit name	Requirement per unit (in sq. ft)	No. of Units	Total area required (In sq.ft.)
	Department Office	500	1	500
	Director/ Dean/ Principal/ HOD`s Office	300	1	300
	Professor`s Office	200	2	400
	Associate Professor`s office	100	4	400
	Assistant Professor`s office	50	8	400
	Common room for Staff	500	1	500
	Room for visiting faculty	300	1	300

	Seminar room/ Mini Auditorium	1000	1	1000
	Conference Room	1500	1	1500
	Class Rooms with LCD projector/ smart class rooms with demonstration couches	1200	4	4800
	Students` common room [Girls]	500	1	500
	Students common room [Boys]	500	1	500
	Library with Reading Room	2500	1	2500
	Discussions /Interaction room	200	1	200

	Out-door Physiotherapy Department	2500	1	2500
	Therapeutic exercise Room	1000	1	1000
Laboratories:				
	Anatomy	1200	1	
	Physiology	1200	1	
Departments				
	Exercise Therapy/ Therapeutic Exercise/ Kinesiotherapy	1200	1	1200
	Electrotherapy & Electrodiagnosis	1200	1	1200

	Department of Muscu- loskeletal & Sports Physio- therapy	1200	1	1200
	Department of Neurophys- iotherapy	1200	1	1200
	Department of Cardio-respi- ratory Physiotherapy	1200	1	1200
	Department of Community Physiotherapy	1200	1	1200
	Department of sports phys- iotherapy, exercise fitness & analysis	1200	1	1200
Other Facilities				
	Hostel for Girls	Separate / shared with other insti- tutions of the same manage- ment	1	
	Hostel for Boys		1	
	Play ground out door			Minimum 3000

Library:

Item	Requirement
Text Books As per syllabus one copy of Book per 10 students per subject.	600-700
Reference books	300 Advanced Books As per requirement
]Journals	At least four international and four national journal
Subscription to electronic data base / e-journals	Required
Mandatory Internet facility Access to e-library Equipment	Minimum 15 computer terminals for 60 students

Teaching Department:

Following departments should be available at the commencement of First year BPT:

1. Department of Kinesiotherapy and Exercise Therapy
2. Department of Electrotherapy and Electro-Diagnosis

Following departments should be available at the commencement of Third year:

1. Department of Musculoskeletal Sciences Physiotherapy
2. Department of Neurosciences Physiotherapy
3. Department of Cardio-Pulmonary Physiotherapy
4. Department of Physiotherapy in Community Health
5. Department of sports physiotherapy

Other Facilities:

- a) Ladies common room with attached wash area
- b) Boys common room with attached wash area
- c) Canteen facility for students and staff
- d) Water Cooler/safe drinking water facility
- e) Internet facility inside campus (Office/Principal Room/Staff Room)
- f) Cycle \ Motorcycle \ Car Parking

Note : The Lab Infrastructure is given for average 50 Student intake ,if Higher no.of seats [i.e 100 intake] is to be granted than the lab facilities should be doubled in each lab and for every equipment Listed for the given details infrastructure for lab and facilities in the college building .

Laboratories

1. Anatomy

1. Disarticulated bone set
2. Specimen/model for soft parts [heart , lung , brain , spinal cord , lower limb , upper limb , spine, GI system , male and female urogenital system]
3. CD /soft ware for simulated demonstration of anatomy
4. Anatomy Software and Virtual Anatomy Models computer with internet connection along with multimedia projector and screen. PC should be installed with soft ware and virtual anatomy models for teaching musculoskeletal and neurological anatomy.
5. Dissection facility or Cadaveric Specimens for soft parts

2 .Physiology

1. Microscope oil immersion with single and double demonstration eye piece
2. Westergren's pipette for E.S.R.onstand (with space pipette)
3. Wintrobe's pipette for ESR and PCVwithstand
4. Hemoglobin-meter
5. Hemocytometer
6. Tuning fork time marker
7. Sphygmomanometer (digital))
8. Stethoscopes
9. Stethoscopes for demonstration with multiple earpieces

10. Polygraphs
11. Spirometer
12. Gas analysis apparatus. Halden's student type
13. Van Slyke's apparatus manometric
14. Shen-ington Starling kymograph (electrically driven)
15. Gas analyser automatic for CO₂, O₂, N₂
16. Basal metabolism apparatus
17. Mosso's Ergograph
18. Clinical thermometer
19. Compass aesthesiometer
20. Thermo-aesthesiometer
21. Algometer
22. Kneehammer
23. Bicycle Ergometer
24. Schematic eye
25. Newton's color wheel
26. Tuning fork to test hearing 32-10000 cps (sets-100.256.512Hz)
27. Dynamometer
28. Perimeter with charts (Lister's)
29. Color perception lantern Edridge green

3.Exercise therapy/ Kinesiotherapy/ Gymnasium (equipment for 60 students)

Sr. No.	Name of Instruments	Laboratory	OPD
	Parallel bar	One	One
	Wall bar	One	One
	Suspension frame with apparatus	Four	One
	Ergocycles	One	One
	Blood pressure apparatus	Ten	Two
	Large full size mirrors	one	one
	Wrist roller/exercise	One	One
	Stepper	One	One

	Shoulder wheel	One	One
	Walker with adjustable heights	Five	Two
	Walker with adjustable heights with castor	Two	One
	Axillary and elbow crutches (adjustable)	10 Pairs each	2 Pairs each
	Tripod stick, quadripod adjustable	Ten each	Two each
	Aluminum sticks	Ten	Two
	Vestibular balls – 26”, 30”, 34”	Two each	One each
	Delorme shoes with weights	Six Pairs	One Pair
	Staircase and slope	One	One
	Tilt table	One	One
	Goniometers – 180, 360	Ten each	One each
	Digital goniometres	Five	One

	Inclinometer	Five	One
	Spinal goniometer	One	One
	Reflex Hammers	Ten	One
	Quadriceps table with weights	One	One
	Equilibrium board both adult and pediatric	One each	One each
	Exercise mats	Six	Four
	Dumbbells, weightcuffs, sandbags, springs of different weights and strengths	Four sets each	One set each
	Rope & Pulley set	Twenty	Five
	Progressive resistance station /Multi-Gym	One	One
	Bolster 3 sizes	One each	One each
	Rowing machine	One	One
	Ankle exerciser	One	One

	Wedge	Two	One
	Medicine balls	Ten	Three
	Resistive bands Different colors	Ten each	Five each
	Finger ladder	One	One
	Skates	Six	Two
	Pedo cycle	One	One
	Wheel chairs with detachable arm rest	Five	Two
	Wooden Plinth	Six	Three
b)Exercise therapy & Kinesiotherapy (For 3rd & 4th Year):			
	Hand dynamo meter	One	One
	Skin fold caliper	One	One
	Body composition analyzer	One	

	Weighing scale	One	One
	Stadiometer (Height Measuring scale)	One	One
	Computerized Treadmill	one	one
	Sensory assessment kit)	One	One
	Pain assessment instrument (PPT-AI-gometer	Four	One
	Hydrotherapy Unit	One	One

4. Electro Therapy & Electrodiagnosis Lab (For 1st & 2nd Year)

Sr. No.	Name Of Instruments	Laboratory	OPD
	Short wave diathermy	Four	Two
	Microwave Diathermy	two	one
	Pulse Diathermy (PEME)	Two	one
	Diagnostic stimulator	Four	two
	Ultrasound therapy unit 1 &3 MHz	Four	Two
	Paraffin wax bath unit	Two	one
	Infrared lamp- Luminous & non-luminous	Four	two

	Cold pack unit / refrigerator with cryo pack of different sizes	One	one
	Hot pack unit/ hydro collator unit with 6 packs	Two	one
	UVR unit	Three	One
	Laser Unit	Three	One
12.			
13.Electro Therapy & Electro diagnosis Lab (For 3rd & 4th Year)			
	E.M.G./N.C.V	one	one
	Diagnostic stimulator	two	two
	EMG Biofeedback unit	One	One
	Extracorporeal shock wave therapy	one	One
	Combination therapy	One	One

5. Department of Musculoskeletal & Sports Physiotherapy

Sr. No.	Name Of Instruments	Lab [min]	OPD [min]
	Wheel chair with detachable arm rest	1	1
	Cambered wheel chair	1	1
	Crutch axillary	5	5
	elbow crutch	5	5
	Walking stick with adjustable height	5	5
	Tripod /terapod walking stick	5	5
	Set of orthosis and splints for upper limb	10	10
	Set of orthosis and splints for lower limb	10	10
	Set of orthosis and splints for spine	10	10
	Treatment couch	10	10

	Pillows	10	10
	Tilt table	1	1
	Articulated bone set	1	1
	articulated spine model	3	3
	balance board	1	2

6. Department of Neuro - Physiotherapy

	Balance assessment & training equipment	One	1
	Suspension frame	1	1
	Wheel chair	1	2
	Parallel bar	1	1
	Strair case	1	1
	Sensory testing kit monofilament	1	1
	Reflex Hammer	1	2
	Balance board	1	1

	Pillows	10	10
	Transfer board	1	1
	Wheel chair	1	2
	Crutches	10	10
	Mat	5	5
	Gym ball	2	5
	bolsters	2	5
	Wedge	5	5

7. Department of Cardio-respiratory Physiotherapy

	Hand held Doppler and venogram	One	1
	Motorized Treadmill with inclination control	One	1
	Cardio-pulmonary exercise testing Unit	One	1
	Nebulizer	Four	One

	Peak Flow Meter	One	One
	Inspiratory Muscle trainer	Five	Five
	Portable Oxygen Cylinder with accessories	One	One
	Non invasive ventilation (BiPAP, CPAP, Auto PAP)	One	1
	Ambu bag	Two	1
	Mechanical vibrator	Four	1
	Arm Ergometer	One	1
	Suction Devices- Electronic and foot operated	Two each	One each
	Pulmonary Function Testing (PFT) System	One	1
	Endotracheal tube, Tracheostomy tube of different sizes	One each	
	Suction catheter of different sizes	5 each	2 each

	Couch for postural drainer	Four	2
	Pillows	Ten	10
	Pedometer	One	1
	Pulmonary function test Machine	One	1
	Incentive Spirometer (Volume and Flow each)	Three each	Three each

8. Department of Community Physiotherapy

	Weighing machine	Two	1
	Baby weighing machine	Two	1
	Skin fold caliper	4 sets	5
	Goniometer	4 sets	5
	Height measuring stand	Two	5
	Vehicle for transport of students / interns and staff to community visits	One	

	Multimedia projector with screen	Two	1
	Portable Public address system	Two	1
	First aid kit	Four sets	4
	Body Composition Analyzer	Two	2
	Portable couch	Four	4
	Portable table	Four	4
	Portable chair	Four	4

Skill lab

	Couch	Four
	Maniquine for CPR	One
	Bandages tapes	Five sets
	Therabands	5 sets
	Bed having facility for propping up patient	Two
	Spine board	Two
	Bolsters	Four
	Mat	Four
	Gym ball	1 set

Physiotherapy Out Patient Department (PT-OPD)

Infrastructure requirements

- 1 Reception area
2. Waiting hall with adequate sitting arrangements
3. Consultation rooms
4. Ancillary area: space for storage of records, reagents, consumables, stationary etc including eating area for staff shall be available in accordance with the workload
5. Electrotherapy unit

Two chamber of 10 ft.X 7 ft for short wave Diathermy unit

One chamber of 10 ft.X7 ft for micro wave Diathermy unit

Minimum one chamber of 10 ft.X7 ft to accommodate Cervical and Lumber Traction systems (Intermittent and Constant) with traction table and other material so as to provide adequate working space to carry out safe procedure.

Another chambers of same size for other electrotherapy modalities with examination couches

linen and electric fitting of required load, as per the specifications of the modalities.

- 61 Separate space for Cryotherapy unit, Wax Bath and Hydrocollator as per the patient load and equipment specifications

6. Exercise Therapy unit

Minimum one consultation room (15 ftX10 ft at least),

Treatment rooms or cabins (at least three of 10ftX10ft each)

Gymnasium for exercise training (25 ft X 20 ft)

Adequate space for the Parallel bars, Gait training and Floor or mat exercises.

7. Hydrotherapy area

It should be placed in the separate chamber of the size as per the equipment specifications. For example if Hubbard's equipment is used, it requires a chamber of not less than 15ftX15ft along with the facility of changing room and wash room.

The centre should have essential facilities like washbasins, wash rooms, drinking water etc.

Furniture and Fixtures

1. Table
2. Chairs
3. Patient examination revolving stool
4. Examination Table or couch
5. Screens
6. Foot Step
7. Stools
8. Storage Cabinet for records etc.
9. Biomedical Waste storage area

List of Essential Equipment

1. Stethoscope - 1
2. Thermometer Digital - 1

3. Torch (flash lights) - 1
4. Sphygmomanometer (B.P. Apparatus) Digital - 1
5. Weighing machine -1
6. Fire extinguisher (as per the norms)

PHYSIOTHERAPY EQUIPMENT as given above

Human Resource Requirements

1. Physiotherapy FACULTY [core}:

Minimum basic qualification and teaching experience required for teachers

	DESIGNATION	QUALIFICATION & EXPERIENCE	PUBLICATION	PAY SCALE
1	Assistant Professor	Bachelor Degree in Physiotherapy (B.P/T./B. Th./P./B.P.Th.), Masters in Physiotherapy (M./P.Th/ M.Sc. P.T/M.PT.) with at least 55% marks (or an equivalent grade in a point scale wherever grading system is followed) from recognized University		As per UGC norms

2	Associate Professor	: Master in Physiotherapy (M.P.T./ M.P.Th. /M.Sc. P.T.) with Five years total experience as Assistant Professor. Ph. D. in any discipline in Physiotherapy recognized by U.G.C.	Essential 05 publications [in total]	As per UGC norms
3	Professor	Masters in Physiotherapy (M.P.T. / M.P.Th./M.Th.P./M.Sc. P.T.) with ten years total experience including five years' experience as Associate Professor (Physiotherapy) With Ph. D. in any discipline in Physiotherapy recognized by U.G.C.	Essential 08 publications [in total]	As per UGC norms

	Principal / Director / Dean / HOD*	Masters in Physiotherapy (M.P.T./ M.Th.P./M.Pth./M.Sc. P.T.) with ten years total experience, with Ph.D. including five years' experience as Professor (Physiotherapy). Senior-most Professor shall be the Principal / Director / Dean recognized by the UGC.	Very good academic and research record	As per UGC norms
	Demonstrator	BPT Degree of Indian University or an equivalent qualification with at least two year experience [Full time Regular mode only]		

*for universities having department of physiotherapy

- a) These qualifications are applicable for future recruitment. The case of teachers who are already holding teaching posts and have more than 10 years teaching experience will continue to hold their post in their respective institution.
- b) Existing Experienced teachers having more than 10 years of teaching experience may be considered for promotion to Assistant Professor subject to fulfilment of essential qualification of Assistant Professor.
- c) There shall be only three designations in respect of teachers in universities and colleges, namely, Assistant Professors, Associate Professors and Professors. However the senior most professor will be eligible for Principal / Director.

- d) Notwithstanding anything contained in these Regulations, any appointment made prior to this recommendation of the Commission shall be protected. The mandatory requirement for PhD for associate professors and professors will be applicable after 5 years from the notification
- e) The post of Demonstrator/tutor is not a teaching faculty positions

2. Teachers of Pre, Para and Clinical/Medical Subjects*:

- a) Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology Orthopaedics, General Medicine, General Surgery, Neurology, Neurosurgery, Prosthetics and orthotics, Pediatrics, Obstetrics and gynecology, Cardiology, Cardiac surgery, Plastic surgery, Physical Medicine and Rehabilitation - MD/MS/ MSc./PhD./DM/M.Ch. in respective specialty.
- b) Psychology & Sociology, Biostatistics – post graduate with 55% marks in respective subject or
- c) English, Computer Applications: post graduate with 55% marks in respective subject

*Staff for pre-clinical/paraclinical, clinical/Medical Subjects can be appointed on fulltime or part time basis as guest/part time faculty

3.Staffing Pattern – Teaching & Non-Teaching Staff

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

	Upto 30 seats	31-40 seats	41-50 seats	51-60 seats	60-100 Seats
Before the start of 1st year of BPT course	Professor – 1 Assoc. Prof. – 1 Asst. Prof. – 2 Demonstrator – 3	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 5	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 5	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 6	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 4 Demonstrator – 10
Before the start of 2nd year of BPT course	Professor – 1 Assoc. Prof. – 1 Asst. Prof. – 3 Demonstrator – 4	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 6	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 4 Demonstrator – 6	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 5 Demonstrator – 8	Professor – 2 Assoc. Prof. – 3 Asst. Prof. – 8 Demonstrator – 10

Before the start of 3rd year of BPT course	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 5	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 4 Demonstrator – 7	Professor – 2 Assoc. Prof. – 2 Asst. Prof. – 4 Demonstrator – 8	Professor – 2 Assoc. Prof. – 3 Asst. Prof. – 5 Demonstrator – 9	Professor – 3 Assoc. Prof. – 5 Asst. Prof. – 10 Demonstrator – 15
Before the start of 4th year of BPT course	Professor – 1 Assoc. Prof. – 2 Asst. Prof. – 3 Demonstrator – 6	Professor – 1 Assoc. Prof. – 3 Asst. Prof. – 4 Demonstrator – 8	Professor – 2 Assoc. Prof. – 3 Asst. Prof. – 5 Demonstrator – 9	Professor – 2 Assoc. Prof. – 4 Asst. Prof. – 6 Demonstrator – 10	Professor – 4 Assoc. Prof. – 8 Asst. Prof. – 12 Demonstrator – 20

Minimum Teaching Workload of Faculty:

1. Professor– 8 hrs. per week
2. Associate Professor – 12 hrs. per week
3. Assistant professor – 16 hrs. per week

Adjunct and Visiting Faculty: Institutions may appoint additional Faculty Members from abroad with equivalent qualifications as Adjunct or Visiting Faculty on part time basis

Non-teaching Staff for institution having up to 60 seats

Sr. No	Post	Numbers
	Physiotherapists	6
	Librarian	1
	Asst. Librarian	1
	Office Superintendent	1
	Accountant	1
	Office Assistant Clerk/DEO	1
	Lab Attendants	8
	Peon/Sweepers/Cleaners	as per the requirement



Chapter 4
Curriculum
Bachelor of Physiotherapy
(5 years program)

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 programs specific to that profession must be addressed. Education programs 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;
- Competent 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 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 Physiotherapy entry level courses also.

4.1. Bachelor of Physiotherapy

Introduction:

Program outcomes

As an independent practitioner, entry level physiotherapy graduate will be able to

1. Demonstrate competencies to provide quality care to the individuals and populations to optimize their movement, function, and quality of life.
 2. Demonstrate competency to examine, assess, evaluate, treat and prescribe physiotherapeutic management of various disease, disorders and trauma conditions.
 3. Promote health and implement strategies informed by best available research evidence to prevent and minimize impairments, activity limitations and participation restrictions caused due to various disorders.
 4. Demonstrate the commitment to provide ethical care through high standards of professional practice.
 5. Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships.
 6. Demonstrate competency to prescribe and comprehend various diagnostic imaging, electrophysiological, hematological and biochemistry investigations for proper diagnosis, treatment or referral to other healthcare professionals
1. Demonstrate competencies to integrate best available research evidence in to clinical decision making and practice
 2. Exhibits commitment towards continuous learning and scholarly activities.
 3. Demonstrate abilities to work effectively with health care team in providing patient centered care.
 4. Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services.
 5. Demonstrate competencies in quality assurance relevant to physiotherapy practice.

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

1. Able to acquire 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 promotion of health, prevention of disease and disorders and various physiotherapeutic interventions to the patient and care givers.
5. Able to demonstrate all competencies to achieve the program outcomes.

Expectations from the future physiotherapy graduates

1. The graduate will be a competent, skilled and reflective physiotherapy practitioner who can work in a variety of physiotherapy settings with patients and clients of all ages and along the continuum of care, from wellness and prevention to management of dysfunction while remaining safe and effective and abiding by legal, ethical and professional standards of practice.
2. The graduate will utilize critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
3. The graduate will participate actively in professional and community organisations. The graduate will be a committed supporter of the advancement and promotion of community health.
4. The graduate will demonstrate lifelong commitment to learning and professional development.
5. The graduate will adopt and adapt innovations, technology, research and critical thinking to keep pace with scientific advancements in physiotherapy and associated fields.
6. The graduate will function as active member in trans-disciplinary and multidisciplinary applications
7. The graduate will be qualified to provide independent physiotherapy evaluation and management in any Indian healthcare facility.
8. The graduate will be qualified to work as independent physiotherapist or in conjunction with a multidisciplinary team to diagnose and treat various disease, disorders and trauma.

9. Course works will skill the graduate's physical/ functional diagnosis, treatment planning and management, administration of physiotherapy treatment and for patient support.
10. Coursework entitles independent physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates.
11. 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.
12. Course works will skill the graduate's physical/ functional diagnosis, treatment planning, management, administration of physiotherapy treatment and for patient support.
13. Graduates can find 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.
14. 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.



Role/Domain	Intended Program Outcomes	Broader Competencies
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<p>Clinician / Physiotherapy Practitioner</p>	<ul style="list-style-type: none"> ● Demonstrate competencies to provide quality care to the individuals and populations to optimise their movement, function, and quality of life. ● Promote health and implement strategies informed by best available research evidence to prevent and minimise impairments, activity limitations and participation restrictions caused due to various disorders. 	<ol style="list-style-type: none"> 1. Plan and implement culture - specific physiotherapy assessment to identify impairments, activity limitations, and participatory restrictions. 2. Examine, assess, evaluate and treat various disorders, diseases and trauma conditions for physiotherapeutic interventions. 3. Prescribe physiotherapeutic modalities, therapeutic exercises, assistive devices, aid, appliances, support systems and home modifications 4. Prescribe and comprehend various diagnostic imaging, electrophysiological, hematological and biochemistry investigations for proper diagnosis and physiotherapeutic treatment 5. Design, implement, evaluate, and monitor patient-centered physiotherapy care based on the available evidence. 6. Involves patients, care givers, and related health care providers in clinical decision making. 7. Evaluate the physiotherapy intervention and modify as required. 8. Considers local and cultural aspects in clinical decision making and plan of care.
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Ethical and professional practitioner	<ul style="list-style-type: none"> • Demonstrate the commitment to provide ethical care through high standards of professional practice. 	<ol style="list-style-type: none"> 1. Incorporates legal and ethical standards in to physiotherapy practice. 2. Demonstrate the knowledge of national, international, and professional association’s policies and ethical standards. 3. Comply with legal standards and regulatory requirements as prescribed by relevant organisations.
Communicator	<ul style="list-style-type: none"> • Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships 	<ol style="list-style-type: none"> 1. Communicate effectively with colleagues, patients, health care providers and other stakeholders. 2. Demonstrate ability to document physiotherapy assessment, plan of care, protocol modification, and evaluation as per the prescribed standards.
Evidence-based practitioner and lifelong learner	<ul style="list-style-type: none"> • Demonstrate competencies to integrate best available research evidence in to clinical decision making and practice. • Exhibits commitment towards continuous learning and scholarly activities. 	<ol style="list-style-type: none"> 1. Demonstrates competencies in acquiring, appraising, and applying research evidence. 2. Identifies need for continuing professional development.

Inter- professional teamwork	<ul style="list-style-type: none"> • Demonstrate abilities to work effectively with health care team in providing patient centered care 	<ol style="list-style-type: none"> 1. Contribute to effective teamwork through comprehensive, collaborative, consultative, culturally responsive, and patient-centred model of practice. 2. Demonstrate competencies for appropriate referral to other medical and health care professionals
Leader and Manager	<ul style="list-style-type: none"> • Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services. 	
Quality assurance	<ul style="list-style-type: none"> • Demonstrate competencies in quality assurance relevant to physiotherapy practice 	Demonstrate knowledge in quality policies, procedures, process, and standards.

Eligibility for admission:

Selection procedure:

1. He/she has passed the Higher Secondary (10+2) or equivalent examination by recognised any Indian board or a duly constituted Board with pass marks and (50%) in aggregate of physics, chemistry and biology (botany & zoology),
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 4 subjects with any of the following group subjects with pass marks (min.50% marks).
 - a. English, Physics, Chemistry, Botany, Zoology
 - b. English, Physics, Chemistry, and Biology
4. He/she has attained the age of 17 years as on - current year
 1. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner to the effect, that the candidate is physically fit to undergo bachelor of Physiotherapy program
 2. For pursuing BPT a candidate with locomotor disability should have disability less than 50% and for visual and speech and hearing disability a candidate should have disability percentage less than 40 %.
 3. The following with locomotor disability shall not be eligible for BPT program - involvement of both upper limb, involvement of dominant upper limb more than 50 % involvement of spine , more than 50 % involvement of lower limb
5. 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 University Entrance admission test. Candidate can also admit through NEET.
 - a. Entrance test, to be conducted by the university/Government/any Competent Authority as per the syllabus under 10 +2 scheme
 - b. Successful candidates on the basis of written test will be called for counselling(s) nominated by the University or the board.

- c. During subsequent counselling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.
- 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:

Annual Pattern: 4 years [38 weeks per year x 6 days per week x 7 hrs per day minimum) academic training, excluding internal and University examination , extracurricular activities,,Public Holidays and Vacations

or

Semester Pattern: 8 semesters (8 semesters x 19 weeks per semester x 6 days per week x 7 hrs per day) academic training, excluding internal and University examination, extracurricular activities ,Public Holidays and Vacations

Internship: 01-year full time rotatory internship program.

Medium of instruction:

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

Teaching/Learning Methods

The teaching methods will adopt competency-based learning for the students. Apart from classroom teaching (contact hours), self-learning will be facilitated to make a graduate lifelong learner. Harnessing the technological advancements, hybrid or virtual learning by using mannequins, simulators, videos, online classes and other methods will be adopted.

Attendance:

A candidate has to secure minimum-

- 80
1. 75% attendance in theory subjects.
 1. 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:

The Continuous Internal Assessment (CIA) forms the Formative Assessment component of the evaluation system while the end year examination as explained along with the formative assessment will become the summative 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 shall be 50% marks in theory and 50% in practical. Candidate has to pass both theory and practical separately. If a candidate fails in practical or theory exam only s/he must have to appear in both theory and practical exam again.

Each paper shall have 40% Internal Assessment and 60% marks for University/External Examination

The internal assessment weightage will be based on following criteria:

	% of the total marks of the internal assessment	
1. Written/ Assignment/ Project Work, attendance etc.	40%	
2 Two Mid-term Tests/	60% (Best of two mid-term tests)	

For a candidate who fails in a paper(s), his/her internal assessment examination for all paper will be carried over and the supplementary examination will; therefore, consists of only an external examination

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 academic year ,However two Examination in an academic year is essential and has to be conducted by the university, one Annual/supplementary or two Semester examination in one Academic Year.

Working days during the semester -

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Each semester shall consist not less than 120 working days excluding examination days.

Promotion criteria

A Candidate shall be declared to have passed the examination if he/she obtained not less than 50% of the marks in theory & practical papers separately

Students can be permitted to next year only if the number of failed subjects is two or less than two and Student must clear these subjects before appearing for the final examination of next year or next higher Class.

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 Commission/ 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 a duly empowered committee of university constituted by the Vice Chancellor.
5. The candidates having a break of study up to five years shall apply for readmission to the appropriate authority of the 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 ten 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.

“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 -

In ordinary cases Migration/transfers of candidates from one institute to another institute shall not be allowed. In extra ordinary circumstances, the prior approval of National Commission for Allied and health care professions shall be necessary before transferring the candidate from one institute to another.

Vacation -

The Head of the Institution/University may declare a maximum of 30 days of vacation (summer, winter leaves) 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/University.

Internship -

All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a period of 1 year approved by the college after passing all examinations in all subjects.

Teaching institute shall be responsible for ensuring the internship of the students in the hospital of the institute or affiliated /approved hospitals.

During the period of internships stipend of reasonable amount must be paid to the students by the institute.

Up to 50% (6 months) of the internship's duration can be completed as externship as per the mechanism prescribed in the internship section

Classification of successful candidates -

A successful candidate

- 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;
- 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';
- 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.

Scheme of examination

Year	Mid semester test MST	Internal exam 20% weightage	Final 80 % weightage
1st year	Mst 1	Internal 1	University exam 1
	Mst 2		
	Mst 3	Internal 2	
2 nd year	Mst 4		
	Mst 1	Internal 1	University exam 2
	Mst 2		
Mst 3	Internal 2		
3 rd year	Mst 4		
	Mst 1	Internal 1	University exam 3
	Mst 2		
Mst 3	Internal 2		

	Mst 4		
4 th year	Mst 1	Internal 1	University exam 4
	Mst 2		
	Mst 3	Internal 2	
	Mst 4		

Regular periodic examinations shall be conducted throughout the course. There shall be no less than two internal assessment examinations. Day to day records and log book should be given importance in internal assessment.

Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject.

Each paper shall have 20% Internal Assessment and 80% marks for External Examination

The final internal marks shall be average of two internal exams

Example

Year	MST	Internal exam weightage	20%	Internal 80 % weightage 20	Final 80 % weightage 80	Total 100
1 st year subject 1	MST 1 MST 2	Internal 1		Average of internal 1 and 2	University exam 1	INTERNAL 20 + UNIVERSITY 80
		1. Attendance	20%			
		2. Written Assignment/ Project Work etc.	40%			
	3. Two Mid-Semester Tests/	60 % (Best of two mid-semester tests)				
MST 3	Internal 2					
MST 4	1. Attendance	20%				

		2. Written Assignment / Project Work etc.	40%		
		3. Two Mid-Semester Tests/	60% (Best of two mid-semester tests)		

The results of IA should be displayed on the notice board within a 1-2 week of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.

Summative assessment consists of University examinations. Each theory paper will have 100 marks. Mandatory 50% marks in theory and practical (practical = practical/ clinical + viva) [theory=theory paper(s) only]

Designing of question paper

Designing of question paper should take into consideration all levels of knowledge domain e.g. Bloom's taxonomy of cognitive domain. Use appropriate verbs for the questions at each level to assess higher levels of learning. An example is given below in Table 4. Use combination of various types of questions e.g. structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs if used, should not have more than 20% weightage

The question paper should be evenly distributed to cover all the sections appropriately from competencies. The blueprinting grid can help the paper setters to balance the question papers in content related aspects as depicted below in Table. Moderation of theory question paper by subject expert may be arranged by Universities

Level Suggested Verbs

Verbs in various levels in Knowledge domain (Bloom's taxonomy)

Blueprinting in knowledge domain

Level	Total
Knowledge	20%
Comprehension	20%
Application	20%
Analysis	10%
Synthesis	10%
Evaluation	10%

Practical/Clinical examination

Practical – 80% viva voce- 20%

Include assessment in psychomotor and effective domain. Assessment of clinical and procedural skills should be based on direct observations by the examiners.

Assessment tools like case presentations, Objective Structured clinical Examination (OSPE OSCE and/or Objective Structured Practical Examination (OSPE) and Directly Observed Procedural Skills (DOPS) should be employed using check lists,

Practical/clinical examinations will be conducted in the laboratories and /or hospital wards/ OPD. Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values.

Practical examination should be conducted by pair of examiners (one internal from same university and one external from another university) only and not by single examiner / examiners of same university.

Credit and grading And Transcript

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

Credits will be assigned on the basis of the lectures (L) / tutorials (T) / Clinical Training (CR) / laboratory work (P) / Research Project (RP) and other forms of learning in a 15-20 week schedule

L - One credit for one hour lecture per week (1 credit course = 15 hours)

P/T - One credit for every two hours of laboratory or practical (1 credit course = 30· hours)

CR - One credit for every three hours of Clinical training/Clinical rotation/posting (1· credit course = 45 hours)

RP - One credit for every two hours of Research Project per week – Max Credit 20· 25 (1 credit course = 30 hours)

Credit Point: It is the product of grade point and number of credits for a course.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Marks equivalence table Grades and Grade Points

Letter Grade	Grade Point	Range of Marks *
O (Outstanding)	10	86-100
A+ (Excellent)	9	70-85
A (Very Good)	8	60 -69

B+ (Good)	7	55 -59
B (Average)	6	50- 54
C (Average)	5	45- 49
D - BELOW AVERAGE	4	40 -44
Ab (Absent)		
NC- not completed	– F) FAIL Below 40	

A student getting 'C' or lower grade in any course in this discipline will be treated as having failed in that course and The weights of 'C' and lower Grades will not be counted in AGPA or CGPA

Annual Grade Point Average (AGPA): It is a measure of performance of work done in a year. It is ratio of total credit points secured by a student in various courses registered in a year and the total course credits taken during that year. It shall be expressed up to two decimal places.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student overall years. The CGPA is the ratio of total credit points secured by a student in various courses in all year and the sum of the total credits of all courses in all the year. It is expressed up to two decimal places.

Computation of AGPA and CGPA

The following procedure should be used to compute the Annual Grade Point Average (AGPA) and Cumulative Grade Point Average (CGPA):

- i. The AGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

$$AGPA (S_i) = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.

- ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the years of a program, i.e.

$$CGPA = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

where S_i is the SGPA of the i th years and C_i is the total number of credits in that year.

- iii. The AGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Iv. Illustration of Computation of AGPA and CGPA and Format for Transcripts

i. Computation of AGPA and CGPA

Illustration for AGPA Course

Course	Credit	Grade letter	Grade point	Credit Point Credit x grade point
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3	Course 1		24	8
4	Course 2		28	7
3	Course 3		18	6
3	Course 4		30	10
3	Course 5		15	5
4	Course 6		24	6
20	Total		139	
	SGPA = credit points/ total credit		139/20 =6.95	

	Total credit	AGPA	SGPA X CREDIT	
years 1	55	6.9	55 X 6.9 =	379.5
years 2	56	7.8	56 X 7.8 =	496.8
years 3	42	5.6	42 X 5.6 =	235
years 4	45	6	45 X 6 =	270
total	195			1381.3
cGPA = credit points/ total credit	1381.3 / 195			
CGPA	7.08			
INTERNSHIP				
TOTAL	144			

Scheme of study [Minimum Hours]

Minimum Available hour per week = 38 [6 days x 7 Hours = 42] Minimum Duration of year = 220 days , or 110 days/Semester or 19 week/Semester

Max.Vacation per year;- 30 days.

Minimum teaching hours per year = 1560

Calculation of credit (As per national credit framework)

1 credit = Theory = 15 Hours

Practical / Clinical - 30 Hours

Field work = 45 Hours

SCHEME OF STUDY BACHELOR OF PHYSIOTHERAPY (B. P. T.)
Annual Pattern First Year B. P. T. Examination

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	practical hours	Total Hours	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical					Theory	Practical	Total
1	BPT- 101 Human Anatomy	20	20	100	20	40	200	180	120	300	12	4	16
2	B.P.T -102 Human Physiology	20	20	100	20	40	200	180	120	300	12	4	16

3	B.P.T -103 Biochemistry	20		80			100	90		90	6	0	6
4	B.P.T -104 Fundamentals of exercise Modalities	20	20	100	20	40	200	120	60	180	8	2	10
5	B.P.T -105 Fundamentals of Electro Physical Agents	20	20	100	20	40	200	120	60	180	8	2	10
6	B.P.T -106 Psychology & Sociology	20		80			100	120	0	120	8	0	8

7	B.P.T -107 Fundamentals of health care delivery Sys- tem In India	20		80			100	120	0	120	8	0	8
8	B.P.T -108 English [NUES]							60	0	60	4	0	4
9	BPT -109 Information Technology [NUES]							60	0	60	4	0	4
	Clinic Orien- tation								150	150		5	5
	Grand Total	140	80	640	80	160	1100	1050	510	1560	70	17	87

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Patten or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for⁹⁹ the University Examination, but the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

SCHEME OF STUDY BACHELOR OF PHYSIOTHERAPY (B. P. T.)

B. P. T. Examination [Ist Semester]

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	practical hours	Total Hours	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical	Theory				Practical	Total	
1	BPT -101 Human Anatomy I	10	10	50	10	20	100	75	45	120	5	3	8
2	B.P.T -102 Human Physiology I	10	10	50	10	20	100	75	45	120	5	3	8

3	B.P.T -103 Biochem- istry I	10		40			50	45	30	75	3	1	4
4	B.P.T -104 Funda- mentals of exercise Modalities I	10	10	50	10	20	100	60	45	90	4	1,5	5.5
5	B.P.T -105 Funda- mentals of Electro Physical Agents I	10	10	50	10	20	100	60	45	90	4	1.5	5.5
6	B.P.T -106 Psychology	10		40			50	60	0	60	4	0	4

7	B.P.T -107 Funda- mentals of health care de- livery System In India I	10		40			50	60	0	60	4	0	4
8	B.P.T -108 English I [NUES]						50	30	0	30	2	0	2
9	BPT -109 Informa- tion Tech- nology I [NUES]						50	30	0	30	2	0	2
	Clinic Orienta- tion								75	75		2.5	2.5
	Grand Total	70	40	320	40	80	550	525	255	780	35	8.5	43.5

First Year B. P. T. Examination [Ist Semester]

N.B.-

**1. Setting Question Paper will be done as per the subjects in Annual Patten or Section A and Section B of Syllabus in Se-
10²mester Pattern.**

2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.

SCHEME OF STUDY BACHELOR OF PHYSIOTHERAPY (B. P. T.)

B. P. T. Examination [2nd Semester]

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	practical hours	Total Hours	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical					Theory	Practical	Total
1	BPT 101 Human Anatomy II	10	10	50	10	20	100	75	45	120	5	1.5	6.5
2	B.P.T -102 Human Physiology II	10	10	50	10	20	100	75	45	120	5	1.5	6.5

3	B.P.T -103 Biochemistry II	10		40			50	45	30	75	4	1.5	5.5
4	B.P.T -104 Fundamentals of exercise Modalities II	10	10	50	10	20	100	60	45	105	4	1.5	5.5
5	B.P.T -105 Fundamentals of Electro Physical Agents II	10	10	50	10	20	100	60	45	90	4	1.5	5.5
6	B.P.T -106 Sociology	10		40			50	60	0	60	4	0	4

7	B.P.T -107 Fundamentals of health care delivery Sys- tem In India II	10		40			50	60	0	60	4	0	4
8	B.P.T -108 English [NUES] II						50	30	0	30	2	0	2
9	BPT -109 Information Technology [NUES] II						50	30	0	60	2	0	2
	Clinic Orien- tation								75	75		2.5	2.5
	Grand Total	70	40	320	40	80	550	525	255	780	37	8.5	43.5

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Patten or Section A and Section B of Syllabus in Semester Pattern.**
- 2.Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination,But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

Second Year B. P. T. Examination Annual Pattern

S.No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T-201 Pathology & Microbiology	20	0	80	0	0	100	120	0	120	8	0	8
2	B.P.T-202 Pharmacology	20	0	80	0	0	100	90	0	90	6	0	8
3	B.P.T-203 Public Health & Health Promotion	20	0	80	0	0	100	120	0	120	8	0	8
4	B.P.T-204 Emergency Care and life support Skills	20	0	80	0	0	100	90	30	120	6	1	7
5	B.P.T205 Exercise therapy	20	20	100	20	40	200	150	120	270	10	4	14

6	B.P.T -206 Electrothera- py	20	20	100	20	40	200	150	120	270	10	4	14
7	B.P.T-207 Biomechan- ics & Kine- siology	20		80			100	120	60	180	8	2	10
8	B.P.T-208 Yoga and Systems of Medicine	20	20	100	20	40	200	120	60	180	8	2	10
9	Clinical Ob- servation	0	0	0	0	0	0	0	210	210	0	7	7
	Grand Total	160	60	700	60	120	110 0	960	600	1560	64	20	84

N.B.-

1. Setting Question Paper will be done as per the subjects in Annual Patten or Section A and Section B of Syllabus in Semester Pattern.

2.Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination,But the marks will be counted with University Marks and will be added in the Scheme and

107 Marks Sheet given by University.

B. P. T. Examination 3rd Semester

S.No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T-201 Pathology & Microbiology -I [Pathology]	10	--	40	--	--	50	60	0	60	4	0	4
2	B.P.T-202 Pharmacology I	10	--	40	--	--	50	60	0	60	4	0	4
3	B.P.T-203 Public Health & Health Promotion I	10	--	40	--	--	50	60	0	60	4	0	4
4	B.P.T-204 Emergency Care and life support Skills I	10	--	40	--	--	50	45	15	60	3	0.5	3.5

5	B.P.T205 Exercise therapy I	10	10	50	10	20	100	75	60	135	5	2	7
6	B.P.T -206 Electrotherapy I	10	10	50	10	20	100	75	60	135	5	2	7
7	B.P.T-207 Biomechanics & Kinesiology I	10		40			50	60	30	90	4	1	5
8	B.P.T-208 Yoga and Sys- tems of Medicine I	10	10	50	10	20	100	60	30	90	4	1	5
9	Clinical Obser- vation	0	0	0	0	0	0	0	105	105	0	3.5	3.5
	Grand Total	80	30	350	30	60	550	480	300	780	32	10	42

N.B.-

1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.

1092. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University

B. P. T. Examination [4th Semester]

S.No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T-201 Pathology & Microbiology-II [Microbiology]	10	--	40	--	--	50	60	0	60	4	0	4
2	B.P.T-202 Pharmacology	10	--	40	--	--	50	60	0	60	4	0	4

3	B.P.T-203 Public Health & Health Pro- motion II	10	--	40	--	--	50	60	0	60	4	0	4
4	B.P.T-204 Emergency Care and life support Skills II	10	--	40	--	--	50	45	15	60	3	0.5	3.5
5	B.P.T205 Exercise thera- py II	10	10	50	10	20	100	75	60	135	5	2	7
6	B.P.T -206 Electrotherapy II	10	10	50	10	20	100	75	60	135	5	2	7
7	B.P.T-207 Biomechanics & Kinesiology II	10		40			50	60	30	90	4	1	5
8	B.P.T-208 Yoga and Sys- tems of Medi- cine II	10	10	50	10	20	100	60	30	90	4	1	5
9	Clinical Ob- servation	0	0	0	0	0	0	0	105	105	0	3.5	3.5
	Grand Total	80	30	350	30	60	550	480	300	780	32	10	42

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

Third Year B. P. T. Examination [Annual Pattern]

S. No.	Subject	Internal Assessment		University Examination			Total	Theory Hours	Practical Hours	Total	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical				Hours	Theory	Practical	Total
		Theory	Practical	Theory	Viva	Practical							

1	B.P.T -301 General Medi- cine	20	--	80	--	--	100	90	30	120	6	1	7
2	B.P.T-302 General Surgery	20	--	80	--	--	100	90	30	120	6	1	7
3	B.P.T -303 Orthopedics	20	--	80	--	--	100	90	30	120	6	1	7
4	B.P.T -304 Physiotherapy in Medical and Surgical Condi- tions	20	20	100	20	40	200	180	120	300	12	4	16

5	B.P.T-305 Physiotherapeutic in Orthopedics Conditions	20	20	100	20	40	200	180	120	300	12	4	16
6	B.P.T-306 Physical & functional Diagnosis & Prescription	20	20	100	20	40	200	120	60	180	8	2	10
7	Research Methodology , Biostatistics and Evidence Based Practice	20		80			100	120	0	120	8	0	0
	Clinical Education								300	300		10	10
	Grand Total	140	60	620	60	120	1000	870	690	1560	58	23	81

N.B.-

1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.

2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.

B. P. T. Examination, [5th Semester]

S.No .	Subject	Internal Assessment		University Examination			Total	Theory Hours	Practical Hours	Total Hours	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -301 General Medicine I	10	--	40	--	--	50	45	15	60	3	0.5	3.5
2	B.P.T-302 General Surgery I	10	--	40	--	--	50	45	15	60	3	0.5	3.5
3	B.P.T -303 Orthopedics I	10	--	40	--	--	50	45	15	60	3	0.5	3.5
4	B.P.T -304 Physiotherapy in Medical and Surgical Conditions I	10	10	50	10	20	100	90	60	150	6	2	8

5	B.P.T-305 Physiotherapeutic in Orthopedics Conditions I	10	10	50	10	20	100	90	60	150	6	2	8
6	B.P.T-306 Physical & functional Diagnosis & Prescription I	10	10	50	10	20	100	60	30	90	4	1	5
7	Research Methodology , Biostatistics and Evidence Based Practice I	10		40			50	60	0	60	0	3	4
	Clinical Education -I								150	150		5	5
	Grand Total	70	30	310	30	60	500	435	345	780	29	11.5	40.5

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

B. P. T. Examination 6th Semester

S.No .	Subject	Internal Assessment		University Examination			Total	Theory Hours	Practical Hours	Total Hours	Credits	Credits	Credits
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -301 General Medicine II	10	--	40	--	--	50	45	15	60	3	0.5	3.5
2	B.P.T-302 General Surgery II	10	--	40	--	--	50	45	15	60	3	0.5	3.5
3	B.P.T -303 Orthopedics II	10	--	40	--	--	50	45	15	60	3	0.5	3.5

4	B.P.T -304 Physiotherapy in Medical and Surgical Condi- tions II	10	10	50	10	50	100	90	60	150	6	2	8
5	B.P.T-305 Physiotherapeu- tic in Orthope- dics Conditions II	10	10	50	10	20	100	90	60	150	6	2	8
6	B.P.T-306 Physical & func- tional Diagnosis & Prescription II	10	10	50	10	20	100	60	30	90	4	1	5
7	Research Methodology , Biostatistics and Evidence Based Practice II	10		40			50	60	0	60	0	4	4
	Clinical Educa- tion								150	150		5	5
	Grand Total	70	30	310	30	60	500	435	345	780	29	11.5	40.5

N.B.-

1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.

1. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.

3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.

Fourth Year B. P. T. Examination [Annual Pattern]

S. No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -401 Neurology, Psychiatry and Neurosurgery	20	0	80	0	0	100	90	30	120	6	1	7
2	B.P.T-402 Physiotherapy in Neurological and Neurosurgical conditions	20	20	100	20	40	200	150	90	240	10	3	13

3	B.P.T-403 Cardiothoracic diseases and surg- eries	20	--	80	--	--	100	90	30	120	6	1	7
4	B.P.T-404 Physiotherapy in Cardio thoracic diseases and Sur- gical Conditions	20	20	100	20	40	200	150	90	240	10	3	13
5	B.P.T-405 Sports Physiother- apy & Exercise Prescription	20	20	100	20	40	200	150	90	240	10	3	13
6	B.P.T-406 PT Ethics, man- agement &Admin- istration	20	0	80	0	0	100	90	0	90	6	0	6
7	B.P.T-407 Community Phys- iotherapy & Reha- bilitation	20	0	80	0	0	100	90	30	120	6	1	7
Project Work Orientation [NUES]							0	90	0	90	6	0	6
CLINICAL ROTATION									300	300		10	10
GRAND TOTAL							1000	900	660	1560	60	22	82

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

B. P. T. Examination [7Th Semester]

S. No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -401 Neurology, Psychiatry and Neurosurgery -I	10	0	40	0	0	50	45	15	60	3	0.5	3.5
2	B.P.T-402 Physiotherapy in Neurological and Neurosurgical conditions -I	10	10	50	10	20	100	75	45	120	5	1.5	6.5

3	B.P.T-403 Cardiothoracic diseases and surg- eries-I	10	--	40	--	--	50	45	15	60	3	0.5	3.5
4	B.P.T-404 Physiotherapy in Cardio thoracic diseases and Sur- gical Conditions-I	10	10	50	10	20	100	75	45	120	5	1.5	6.5
5	B.P.T-405 Sports Physiother- apy & Exercise Prescription-I	10	10	50	10	20	100	75	45	120	5	1.5	6.5
6	B.P.T-406 PT Ethics, man- agement &Admin- istration -I	10	0	40	0	0	50	45	0	45	3	0	3
7	B.P.T-407 Community Phys- iotherapy & Reha- bilitation-I	10	0	40	0	0	50	45	15	60	3	0.5	3.5
Project Work Orientation [NUES]-I							0	45	0	45	3	0	3
CLINICAL ROTATION-I									150	150		5	5
GRAND TOTAL							500	450	330	780	30	11	41

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

B. P. T. Examination [8Th Semester]

S. No.	Subject	Internal Assessment		University Examination			Total	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -401 Neurology, Psychiatry and Neurosurgery -II	10	0	40	0	0	50	45	15	60	3	0.5	3.5
2	B.P.T-402 Physiotherapy in Neurological and Neurosurgical conditions -II	10	10	50	10	20	100	75	45	120	5	1.5	6.5

3	B.P.T-403 Cardiothoracic diseases and surg- eries-II	10	--	40	--	--	50	45	15	60	3	0.5	3.5
4	B.P.T-404 Physiotherapy in Cardio thoracic diseases and Sur- gical Conditions-II	10	10	50	10	20	100	75	45	120	5	1.5	6.5
5	B.P.T-405 Sports Physiother- apy & Exercise Prescription-II	10	10	50	10	20	100	75	45	120	5	1.5	6.5
6	B.P.T-406 PT Ethics, man- agement &Admin- istration -II	10	0	40	0	0	50	45	0	45	3	0	3
7	B.P.T-407 Community Phys- iotherapy & Reha- bilitation-II	10	0	40	0	0	50	45	15	60	3	0.5	3.5
Project Work Orientation [NUES]-II							0	45	0	45	3	0	3
CLINICAL ROTATION-II									150	150		5	5
GRAND TOTAL							500	450	330	780	30	11	41

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Part A and Part B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

[

B.P.T. INTERNSHIP GUIDELINES

- Candidates seeking entry to the internship period must have passed all examinations in all subjects (i.e. He/She must have secured total credits of the Programme).
- Duration: 12 month inclusive of posting in rural setup/CBR/similar setup.
- During the internship candidate shall have to work full time average 7 hours per day (each working day) 6 day /week for 12 Calendar months .Each candidate is allowed maximum of 12 holidays during entire Internship Programme and in case of any exigencies during which the candidate remains absent for a period more than 6 days, he/she will have to work for the extra days during which the candidate has remained absent.
- Assessment: The interns/candidate shall maintain the record of work, which will be verified and certified by the Head of the Department under whom he/she works. Apart from scrutiny of the record of work, the Head of the Department shall undertake assessment and evaluation of training in attendance, discipline, knowledge, skills and attitude for the duration of training. The assessment report of the candidate shall be sent to the Parent institution.
- Based on the record of work and date of evaluation the Director/Principal shall issue _Certificate of Satisfactory Completion of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.
- In the event of unsatisfactory report, the said intern shall have to repeat the internship for the period to be decided by the Head of the Institution concerned.
- Intern will abide by all the rules & regulations of Institution/Hospital where they are posted.
- Intern shall be responsible for proper use of equipment of the Institute/Hospital where they are posted. He/She shall be liable to pay for damages caused to the equipment resulting from improper use by him/her.
- Internship duration can be extended by the Principal / Director on the grounds:
 - i. Remaining absent in excess of the permitted 6 days leave period, which is due: An intern will compensate by working extra for each day leave taken.
 - i. Unsatisfactory performance during the period: If there are unsatisfactory reports in terms of performance of the intern, submitted by the Department In-charge, the said intern shall have to repeat the internship for a period at least two months further.
 - ii. Case of indiscipline at any level: A Discipline and Action Committee will be formed in the college / Institution convened by Internship coordinator/HOD PT & headed by Director/Principal. In case of any lack of discipline, breach of trust or indulgence in any criminal activity on the part of the interns when reported by the concerned departments of Hospitals/Institutions where

the interns have been posted, the defaulting Intern shall be called back immediately and subjected to disciplinary proceedings by the Disciplinary Action Committee.

iii. Punishments:

- a. Suspension of Internship for a period of 3-4 weeks for the reasons to be recorded. Following this disciplinary suspension, internship can be resumed only after submission of an appropriate undertaking/guarantee/surety. Period of suspension shall be considered as Break in Internship. Disciplinary Action Committee shall decide the period of suspension and resumption of Internship for a specified period.
- b. Rustication & Termination: In case of a serious complaint of indiscipline or breach of trust against intern or any criminal activity done by intern according to the law of the country, he/she may be rusticated along with termination of Internship. Hon'ble Court of Law can resume the Internship in this case only on the abrogation of criminal charges against him.
 - Institution shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute / Hospital where the internship training has to be undertaken. Following parameters / guidelines have been suggested:
 - a. It is mandatory for the Institution conducting BPT Programme to have its own Physiotherapy clinic fully furnished with all the necessary equipment as per the curriculum of the Programme.
 - b. The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.
 - c. Senior Physiotherapist with sufficient clinical experience should manage the physiotherapy departments in the Institutes/Hospitals.
- d. Institute Director / principal can at his discretion grant NOC to the students to do the Internship at the place of his choice provided, the concerned Hospital fully satisfies the above criteria. For the purpose of granting NOC the candidate shall have to submit to the Institution the status of Physiotherapy Services available at the place where he intend to do his Internship.

EVALUATION OF STUDENTS UNDER PRACTICAL/INTERNSHIP

S. No.	Description	Satisfactory/ Unsatisfactory
1	Attendance	
2	Discipline and general behavior in the Department	
3	Approach to patients	
4	Inquisitiveness regarding the subject	
5	Knowledge about evaluation of conditions	
6	Knowledge about various therapeutic modalities	
7	Knowledge about actual application of therapeutic skills	

Internship 12 months = 1 year = 2016 hours[Minimum Hours] (7X6X48)

Internship

Internship shall be part of the curriculum of the bachelor of physiotherapy and shall be called “Rotatory clinical internship”

1. Goals

The goal of the internship programme is to train the physiotherapy graduate in such a manner that they will be able to assess, diagnose and treat the patients independently.

2. Objectives- At the end of internship programme the physiotherapy graduate should have following competencies.

- 1.Can assess, diagnose, prevent and treat the patients of physiotherapy independently
- 2.Opportunity to develop confidence and increase skill in simulation and treatment delivery
- 3.Effective communicator with patient, families, colleagues and the community.

Ability to upgrade themselves with recent advances, treatment procedure and research in the field of physiotherapy.

3. Duration

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3.1 Total duration- One year or twelve months; Seven hours a day for six days a week amounting to min 2016 hours.

During the period of internship the student shall be posted in rotation in the OPD & IPD facilities of the clinical departments of the hospitals of the institution/university.

The hospitals must have separate physiotherapy department with qualified and registered physiotherapy professionals (with the respective physiotherapy council/ commission).

3.2 Time distribution

The title during placement of internship would be Physiotherapy intern/ B.P.T. Intern. 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.

3.3 Eligibility of starting internship; BPT students declared to have passed all the examinations (University & internals) both Theory and Practical's for all subjects of all 4 years.

4. PROVISIONAL REGISTRATION-

Before starting the internship, it will be the responsibility of the teaching institute to report name, and details of the candidates starting the internship and student should take provisional registration from the commission/council.

5 The title during placement of internship would be Physiotherapy intern/ B.P.T. Intern. 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 7 hours per day.

S No.	Departments / areas	Duration
	Musculoskeletal Physiotherapy	2 Month
	Neurological Physio- therapy	2 Month
	Cardiopulmonary Physiotherapy	2 Month
	Sports Physiotherapy	1 month
	Community Physio- therapy	1 month
	Obstetrics and gyne- cological Physiother- apy	1 month
	Medicine	1 month

	Surgery	15 days
	Pediatrics	15 days
	Oncology	15 days
	Burns and Plastic Surgery	15 days

5. Administration

5.1 Authority-

- A. The faculty Intern/ student ratio shall be maximum 1:10
- B. The departments shall be headed by the senior most physiotherapist (registered with the council/committee) according to the hierarchy prescribed by the commission, in clinical settings. The internship shall be coordinated by the faculty of the institution for adequate clinical training and teaching as per the curriculum.
- C. The physiotherapy faculty in the hospital shall be responsible for the clinical training and teaching of the student in OPD & IPD's and ICU's. Each student will maintain the log book for daily clinical activities / learnings as per the clinical schedule assigned to him/her in accordance with the curriculum, and present the case reports for discussion in the clinical discussion meetings once every week at the place of their clinical postings. The presentation by the students shall be moderated by the institutional faculty and in-charge physiotherapist. Each intern must present at least twelve case presentations/ peer group review, from clinical departments he/ she is posted in.
- D. The internship completion certificate must be signed by the supervising physiotherapist/ HOD physiotherapy and counter signed by the principal of the institute. The certificate must display/ mention all the clinical departments where the student had been placed in, along with the number of days (with dates) of his/her postings in respective clinical departments/ facilities. This certificate shall be mandatory requirement for registration of the applicant for the practice of the profession.
- E. The clinical facilities/ hospitals shall be inspected by the commission for allocating the number of clinical trainees / intern in each hospital/ facility.

5.2 Leave- The student shall be allowed maximum one leave per month only apart from one day weekly off during internship. In case of any medical or other exigency, the student has to compensate for the number of days he/she has been absent due to such reason for the period beyond 12 leaves.

6. Assessment -

6.1. Initial Assessment Documentation: An intern 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 of the client or other relevant carers
- g. Discharge plan
- h. Agreement of treatment plan by patient or “person responsible”

6.2. 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

6.3.Case Presentations:

12 Case presentation is mandatory during the one year internship.

7. PROJECT WORK

PROJECT WORK*

Course objective:

The student will be doing specific case studies allotted by their teacher/guide. Subject is for Case Presentations and evaluations. Minimum 5- 10 cases are to be documented for discussion.

EXAMINATION

*There will be no university examination. Students will be assessed on the basis of Viva on his/her project work and the awards so secured by them will be sent to University

The candidate shall submit a project under the supervision of a physiotherapy faculty during internship. The project may be a case study or recent technique or literature reviews and etc. To make the student to have research mind and to facilitate for higher studies.

The interns shall maintain the record of work which is to be verified and certified by the Physiotherapy faculty under whom he/she works. Based on the record of work and project, The Internship completion shall be reported in the form of grades by the HOD/ principal while issuing “Certificate of Satisfactory Completion” of internship following which University shall award the BPT degree. All internees will be assessed based on their satisfactory attendance, performance in the postings/ and the presentation of the logbook and project. The credits and hours of internship will be mentioned in transcript. The internship assessment weightage will be based on following criteria-

Domains	% of total marks of the internal assessment
attendance	10%
Log book	30%
project	60%

8.SKILLS BASED OUTCOMES AND MONITOR ABLE INDICATORS FOR BACHELOR OF PHYSIOTHERAPY

Bachelor of Physiotherapy

8.1Competency Statements

1. Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.
2. Collect 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 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 nutrition, exercises, rest, relaxation and 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.

Guidelines for the implementation of the training procedure

Discipline

1. Musculoskeletal physiotherapy

Goal- The aim of teaching the undergraduate student in musculoskeletal physiotherapy is to impart such knowledge and skills that may enable them to assess and give physiotherapy treatment to orthopaedic related problems. He/she shall acquire competence to deal with orthopaedic related problems. The details are as under;-

- A. Orthopaedic Assessment of patients
- B. Physiotherapy treatment of post-operative fractures
- C. Physiotherapy treatment of orthopaedic conditions
- D. Assessment and physiotherapy management of arthroplasty
- E. Assessment and physiotherapy management of various degenerative conditions
- F. Rehabilitation of amputee
- G. Rehabilitation of poliomyelitis
- H. Assessment and physiotherapy management of congenital deformities.

2. Neurological Physiotherapy

Goal- The aim of teaching the undergraduate student in neurological physiotherapy is to impart such knowledge and skills that may enable them to do physiotherapy assessment, functional assessment and give physiotherapy treatment to neurological related conditions. He/she shall acquire competence to deal with neurological related problems. The details are as under;-

- A. Neurological Assessment of patient
- B. Motor and sensory assessment
- C. Balance and coordination assessment
- D. Examination of cranial nerves
- E. Examination of higher function
- F. transfers and ambulation of patient with spinal injuries
- G. Physiotherapy management of various neurological conditions

3. Cardiopulmonary Physiotherapy

Goal- The aim of teaching the undergraduate student in Cardio-pulmonary physiotherapy is to impart such knowledge and skills that may enable them to do physiotherapy assessment and give physiotherapy treatment to cardiopulmonary related conditions. He/she shall acquire competence to deal with Cardio-pulmonary related problems. The details are as under;-

- A. Bed side case discussion and presentation
- B. Cardiopulmonary assessment of patient
- C. ICU monitoring
- D. Cardiac rehabilitation
- E. Pulmonary rehabilitation
- F. Pre and post-operative treatment in cardiothoracic conditions
- G. Various physiotherapy techniques used in cardiothoracic conditions
- H. Chest physiotherapy for neonates and children

4. Sports Physiotherapy

Goal - The aim of teaching the undergraduate student in sports physiotherapy is to impart such knowledge and skills that may enable them to assess and give physiotherapy treatment and rehabilitate the sports related conditions. He/she may acquire such competency that they can assess and treat sports injury at the field and out-patient department. The details are as under; -

- A. Pre participation evaluation for risk factor identification.
- B. Assessment and physiotherapy management of acute sports injuries.
- C. Assessment and physiotherapy management of overuse sports injuries.
- D. Testing of fitness components such as power, endurance, flexibility, balance.
- A. Bandaging and taping application. Disability evaluation and its rehabilitation
- B. Principles of orthotics and prosthetics
- C. Management of various intellectual disabilities and its rehabilitation including vocational training
- D. Rehabilitation of various speech and hearing impairments, vocational and social rehabilitation.
- E. Knowledge of assisted devices
- F. Handling sport injury emergency.

5. Community Physiotherapy

Goal- the aim of undergraduate student in community physiotherapy is to impart such knowledge and skills that may be enable them to assess and physiotherapy treatment to common community related conditions and recognize the importance of community involvement. He/she shall acquire competence to deal effectively with and individual and community in the context of primary health care.

6. Obstetrics and gynaecological Physiotherapy

Goal - The aim of teaching the undergraduate student in Obstetrics and gynaecological physiotherapy is to impart such knowledge and skills that may enable them to assess and give physiotherapy treatment to Obstetrics and gynaecological related conditions He/she shall acquire competence to deal with Obstetrics and gynaecological related conditions. The details are as under;-

- A. Assessment and physiotherapy management of antenatal and postnatal cases.
- B. Physiotherapy management in cases of prolapse uterus
- C. Physiotherapy management in cases of menstrual disorders and other gynecological disorders.
- D. Physiotherapy management in urinary incontinence
- E. Physiotherapy management in pelvic inflammatory disease.

7. Medicine/ Surgery/Oncology/ Pediatrics/ Emergency Medicine and trauma/ Dermatology/ Burns and Plastic surgery

Goal- The aim of teaching the undergraduate student in various disciplines is to impart such knowledge and skills that may enable them to assess and give physiotherapy treatment in various conditions. He/she shall acquire competence to deal in Medicine/ Surgery/Oncology/ Pediatrics/ Emergency Medicine and trauma/ Dermatology/ Burns and Plastic surgery disciplines. The details are as under;-

- A. Monitoring of vital signs
- B. Assessment and physiotherapy management of common cardiothoracic conditions.
- C. Assessment and physiotherapy management of common respiratory conditions.
- D. ICU monitoring
- E. Assessment and physiotherapy management of pre and post common surgical conditions.
- F. Assessment and physiotherapy management of diseases commonly encounter in neonates and children
- G. Screening of developmental disorders
- H. Assessment and Rehabilitation of various speech and hearing impairments in children.
- I. Chest physiotherapy in neonates and children.
- J. Assessment and physiotherapy management of burn cases.
- K. Assessment and physiotherapy management of cancer patients.
- L⁴¹ Assessment and physiotherapy management of common integumentary conditions.

Intended Course Outcome With Competency Levels, Learning Methods and Assessment.

Course	Intended Learning Outcome	Teaching Learning Methods	Assessment Methods
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Competency level	K – Knows [Describe, Define] KH – Knows How [Explain, Analyse, Identify, Recognise] S- Shows [Demonstrate] SH – Shows How [Demonstrate] P- Performs Independently [Perform]	<ul style="list-style-type: none"> • Lecture • Tutorial • Demonstration using models including digital • Flipped class • Dissection • panel discussion • field Visit • case study • Debate • Practical [Lab Work • Video Demonstration • Role Play • Hands On • Virtual Reality • Simulation • Case Discussion 	<ul style="list-style-type: none"> • MCQs • Assignments • Short Essays • Long essay • Spotters • Viva Voice • Presentations • Debate
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B.P.T 1ST YEAR SYLLABUS

COURSE CODE - BPT -101

Course Title: Human Anatomy

Course Title: Human Anatomy

Subject Description and instruction to teacher

Anatomy is the first language of medical science. It is important that student be provided with the basic information about the ways of learning the various terminologies and concepts. The course is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Musculoskeletal system should be taught in greater details with emphasis on muscles joints, nerves and blood vessels of upper limb, lower limb and spine. The brief description of abdomen thorax and head and neck should be given so as to help in locating the surface land marks and identification of important structures.

Course Outcomes:

Course

Intended Learning Outcome

Teaching Learning Methods

Assessment Methods

Competency level

K – Knows

KH – Knows How

S- Shows

SH – Shows How

P- Performs Independently

Anatomy

1. Describe common anatomical terms.(K)
2. Describe the basic embryological development of structures (K)
3. Discuss the classifications of bones, their general features, structure, functions and the mechanism of displacement and common sites of fractures (KH)
4. Identify the skeletal muscles, their origin, insertion, nerve supply, actions, and main relations. (KH)
5. Describe Muscle Groups, their actions, nerve supply and effects of nerve injury. (K)
6. Discuss the joints of the body, their movements, and the muscles responsible for the movements. (KH)
7. Identify the borders of the named anatomical regions along with their associated fascia, ligaments, tendons, or cartilages. (KH)
8. Recognize anatomical structures and describe the topographic anatomy of the regions of abdomen, pelvis, perineum, thorax, and extremities.(KH)
9. Describe the anatomy of the components of organ systems of the body based on the anatomical region. (Thorax, abdomen, pelvis, and perineum). (K)

10. Describe the components nervous system, including the cerebrum, brainstem, cerebellum, spinal cord, peripheral nerves, sensory motor, and autonomic nervous system.(K)

11. Identify clinically relevant injuries, lesions and anatomical malformations including musculoskeletal and nervous system. (KH)
 - Lecture
 - Tutorial
 - Demonstration using models including digital
 - Flipped class
 - Dissection
 - MCQs
 - Short Essays
 - Spotters

Course Contents

SECTION A

Unit 1:

1.

- Define Scope of Anatomy
- Discuss the Anatomical Position and anatomical Terminology common anatomical terminologies (Groove, tuberosity, trochanters etc.)
- Identify Anatomical positions of body, axes, and planes

Bones

- Discuss Composition, Functions, Classification based on Morphology,
- Describe Development and Structure; Formation / Development of Bones esp. Long Bones; Parts of Long Bones
- Discuss the Blood Supply of Bones

Cartilage:

- Describe Types and Features of cartilage

Joints:

- Define and state types
- Discuss the features of fibrous, Cartilaginous & Synovial joints, sub-types of synovial joints
- Explain the movements of joints, factors permitting and limiting these movement
- Discuss blood supply of joints; applied aspects.

Muscles:

- Discuss Comparative Feature of Skeletal, Smooth and Cardiac Muscles, parts & structure of Skeletal Muscle including fascicular architecture
- Describe Blood supply and nerve supply of Skeletal Muscle; Motor Unit
- Discuss the Types of Skeletal Muscles based on their action i.e. Agonists, Antagonists, Fixators, Synergists, Origin & Insertion, Tendon; Isometric & Isotonic contractions; Applied Aspects

Connective Tissue:

- Explain Composition i.e. Cellular & Non-Cellular components; Types and functions of connective tissue; Ligaments; Applied Aspects.

General Embryology:

- Describe Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations. Development of skin, Fascia, blood vessels, lymphatic, (outline only details not required).
- Discuss Development of bones, axial and appendicular skeleton and muscles, Neural tube, brain vessels and spinal cord, Development of brain and brain stem structures

Integumentary System:

- Discuss the Structure of skin and its appendages

UNIT 2: Musculo Skeletal Anatomy of Upper Extremity

- Identify Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, and Phalanges.
- Identify 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.
- Explain Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
- Discuss Arches of hand, skin of the palm and dorsum of hand.

Unit 3: Thorax:

Cardio-vascular system

- Describe Mediastinum: Divisions and contents Pericardium
- Describe Thoracic Wall: position, shape and parts of the heart; conducting System
- Describe blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.

Respiratory system

- Outline the respiratory passages, Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.
- Describe Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.
- Describe Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

UNIT 4: Musculo Skeletal Anatomy of Lower Extremity

- Identify Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.
- Identify Soft parts: Gluteal region, Anterior, posterior, medial and lateral aspects 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.
- Discuss Joints of the lower limb: Hip Joint, Knee joint, Ankle and joint, joints of the foot.

Unit 5: Musculo skeletal anatomy of trunk & pelvis:

- Identify Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.
- Discuss Soft tissue: Pre and Para vertebral muscles, intercostal muscles, anterior abdominal wall muscles, Inter-vertebral disc.
- Describe Pelvic girdle and muscles of the pelvic floor.

SECTION B

Unit 6: Abdomen:

- Describe Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
- Describe large blood vessels of the gut.

- Identify Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, and gall bladder.
- Describe Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.

Unit 7: Endocrine glands:

- Describe 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.

Unit 8: Musculo Skeletal Anatomy of Head and Neck:

- Identify Osteology: Mandible and bones of the skull.
- Identify Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.

Unit 9: Neuro Anatomy

- Discuss Organization of Central Nervous system - Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system (Cranial nerves, Peripheral nervous system, Peripheral nerve , Neuromuscular junction , Sensory end organs , Central Nervous System, Spinal segments and areas, Brain Stem , Cerebellum , Inferior colliculi , Superior Colliculi , Thalamus , Hypothalamus , Corpus striatum , Cerebral hemisphere , Lateral ventricles ,Blood supply to brain , Basal Ganglia, The pyramidal system , Pons, medulla, extra pyramidal systems , Anatomical integration)

Practical

1. Identify the parts of bones (Upper limb, lower limb and spine)
2. Identify the muscles of extremities, trunk and face on a dissected human body/3 D models.
3. Identify the joints of extremities, trunk and face on a dissected human body/3 D models.
4. Identify the course and relationships of major peripheral nerves including plexuses formation
5. Identify the surface markings of joints, fascia, ligaments and muscles of extremities, trunk and face on a model
6. Identify the gross structure of heart, lungs, brain and spinal cord on a dissected human body/3 D models

Recommended Text Books

1. Snell RS. Clinical anatomy: an illustrated review with questions and explanations. Lippincott Williams & Wilkins; 2004..
2. Inderbir Singh, Text book of Anatomy with color Atlas – Vol. 1, 2, 3. Jaypee Brothers
3. Chaurasia BD. Human anatomy Volume- I, II & III, CBS Publisher; 2004.
3. Singh I. Textbook of human neuroanatomy. Jaypee Brothers Publishers; 2006.
4. Kadasne'S T.B. of Anatomy Vol.1 Upper and Lower Extremities2009
5. Singh V. Textbook of clinical neuroanatomy. Elsevier Health Sciences; 2014.
6. Dutta AK. Essentials of human anatomy, head and neck.

Recommended Reference Books

1. Gray's Anatomy: Descriptive and Applied. Longman

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2. Snell RS. Neuroanatomy:

3. Singh V. Textbook of clinical neuroanatomy.
4. Romanes GJ. Cunningham's manual of practical anatomy
5. McMinn's Last's Anatomy – Regional and applied, Churchill Livingstone.
6. McMinn, et al - A Colour Atlas of Human Anatomy, Mosby.
7. Snell – Clinical Anatomy- Lippincott.

COURSE CODE BPT 102

Course Title Human Physiology

Subject Description and instruction to teacher

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. The emphasis should be given on physiological aspect of human movement and the effects thereof.

Course Outcomes:

Physiology

Course Outcomes

Teaching Learning Methods

Assessment

1. Describe the key physiological terms. (K)
2. Discuss the structure and functions of cell and tissue.(KH)
3. Discuss the mechanism of homeostasis (KH).
4. Describe the structure and transport functions of cell membrane (carrier-mediated active transport systems, ion pumps and channels, origin of membrane potential and the basis of membrane excitability) (K)
5. Explain the physiology of skeletal muscle contraction.(KH)
6. Explain the functions of cardio-vascular, respiratory, musculoskeletal and nervous systems including regulatory mechanism. (KH)
7. Describe the functions of digestive, renal and reproductive systems.(K)
8. Demonstrate competencies in performing common physiological and anthropological measurements. (SH)
9. Discuss the common physiological deviations of cardio-vascular, respiratory, musculoskeletal and nervous systems related to physiotherapy practice. (KH)

10. Explain normal physiological changes of various systems during exercise. (KH)

11. Discuss the physiological adaptations to exercise (KH)

- Lecture
- Tutorial
- Demonstration using models including digital tools
- Flipped class
- MCQs
- Assignments
- Short Essays
- Long essay
- Spotters

THEORY
SECTION A

Unit 1: General Physiology

- Discuss Cell: Morphology. Organelles: their structure and functions And Transport Mechanisms across the cell membrane
- Discuss Body fluids: Distribution, composition.

Unit 2: Blood

- Explain Composition and functions of blood and Plasma:
- Describe RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief)
- Describe Hemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.
- Discuss WBC. Morphology, functions, count, its variation of each. Immunity
- Describe Platelets: Morphology, functions, count, its variations
- Discuss Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.
- Describe Blood Groups
- Describe Cross matching. Indications and complications of Blood Transfusion

- Discuss Composition, formation, circulation and functions of Lymph

Unit 3: Cardiovascular system

- Describe: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- Explain Conducting system in terms of Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
- Discuss Normal value. Determinants. Stroke volume and regulation of Cardiac Output: Heart rate and its regulation. Their variations
- Describe Definition Normal values and its variations. Determinants. Peripheral resistance of Arterial Blood Pressure Regulation of BP Arterial Pulse
- Discuss the causes and features of Shock
- Discuss Regional Circulations such as Coronary, Cerebral and Cutaneous circulation.
- Discuss cardiovascular changes during exercise.

Unit 4: Respiratory System

- Discuss the functions of – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.

- Explain the Mechanics of breathing in terms of Intra pleural and intrapulmonary pressure changes during respiration. Chest expansion.
- Discuss Spirometry- Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume
- Discuss Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
- Explain Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen-hemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.
- Explain Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.
- Discuss Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnia. Asphyxia. Cyanosis – types and features. Dysbarism
- Explain Respiratory changes during exercise

Unit 5: Digestive System

- Describe the functions of digestive system
- Describe Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication
- Discuss the stages and Function of Swallowing

- Describe Stomach in terms of Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.
- Describe Pancreatic Secretion: Composition, production, function. Regulation.
- Discuss the Functions of liver, Gall bladder And Composition, functions of bile.

Unit 6: Renal System

- Describe the functions of renal system. Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.
- Discuss the Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.
- Explain Tubular Reabsorption: Reabsorption of Na⁺, glucose, HCO₃⁻, urea and water. Filtered load. Renal tubular transport maximum. Glucose clearance: T_mG. Renal threshold for glucose.
- Discuss the Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.
- Describe Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.
- Describe Acid-Base balance

- **SECTION B**

- Unit 7: Reproductive System

- Discuss the physiology of reproductive organs. Sex determination. Sex differentiation. Disorder
- Describe Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.
- Describe Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: estrogen and progesterone-action. Regulation of secretion.
- Describe Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause.
- Describe Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods

- Unit 8: Endocrine System

- Enumerate Major endocrine glands.
- Describe classification, mechanism of action and Functions of hormones
- Describe Pituitary hormones: Secretory cells, action on target cells, and regulation of secretion of each hormone.
- Describe Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease

- Describe Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.
- Describe Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytoma.
- Describe Endocrine Pancreas: Secretory cells, action, regulation secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.

Unit 9: Nerve Muscle Physiology

- Discuss Resting membrane potential. Action potential – ionic basis and properties.
- Describe Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.
- Describe Neuroglia: Types and functions
- Classify Skeletal muscle Structure.
- Discuss the physiology of neuromuscular transmission
- Discuss the applied aspects of neuromuscular disorders

Unit 10: Nervous System

- Describe Organisation of CNS – central and peripheral nervous system.
- Describe Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties
- Discuss Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway
- Discuss Sensory cortex. Somatic sensations: crude touch, fine touch tactile localization, tactile discrimination, stereo gnosis vibration sense,
- Describe kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain –slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain.
- Describe Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.
- Describe Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL
- Discuss Spinal cord Lesions: Complete transection and Hemi section of the spinal cord.
- Describe Cerebellum: Functions. Cerebellar ataxia.
- Describe Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.

- Describe Functions of Thalamus and Hypothalamus: Nuclei. Thalamic syndrome
- Describe Reticular Formation and Limbic System: Components and Functions.
- Describe Structures and functions of Basal Ganglia:. Parkinson's disease
- Describe Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.
- Describe Formation, composition, circulation and functions of CSF Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.
- Describe Features and actions of parasympathetic and sympathetic nervous system

Unit 11: Physiology Of Exercise –

- Explain the Effects of acute and chronic exercise on respiratory, cardio vascular and musculoskeletal system

Practical

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

- Perform the following clinical examination procedures
 - Body Temperature measurement
 - Pulse rate
 - Blood Pressure

- Oxygen saturation
- Respiratory rate
- Differentiate Blood cells
- Determine the blood cell counts
- Determine Blood groups
- Calculate bleeding and clotting time
- Observe the procedures of common blood investigations
- Elicit superficial and deep tendon reflexes
- Determine muscle tone
- Interpret normal ECG wave pattern
- Identify normal breath sounds
- Differentiate Heart sounds including murmurs

Recommended text Books

1. Text book of Physiology –Anand & Manchanda, Tata McGraw Hill.
2. Human Physiology – Vol. 1 & 2, Chatterjee. CC, Calcutta. Medical Allied.
3. Concise Medical Physiology. Chaudhari, S.K, New Central Agency, Calcutta.
4. Principles of Anatomy and Physiology. Tortora & Grabowski –Harper Collins.
5. Text book of Practical Physiology – Ghai – Jaypee

Recommended Reference Books

Text book of Medical Physiology –Guyton Arthur (Mosby.)

Best & Taylor's Physiological Basis of Medical Practice

West's Respiratory Physiology.

Nunn and Lumb's Applied Respiratory Physiology

COURSE CODE BPT 103

Course Title BIOCHEMISTRY

Subject Description and instruction to teacher

The course in Biochemistry is designed to give the student an introductory knowledge of biochemistry of living organisms and nutrition, particularly in the human body. The major topics covered include the following: carbohydrate, lipid, amino acids, enzymes, nucleic acid, vitamins, minerals hormones, nutrition and clinical biochemistry. The details of chemical structures should be avoided. the emphasis should be on understanding the process of metabolism and relative contribution of nutrients . the importance of clinical biochemistry in diagnosis and management of disorders need to be highlighted

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the structure, composition and functions of cell.(K)
2. Describe the structure and functions of cell membrane.(K)
3. Explain the metabolism of carbohydrates, Lipids, proteins and amino acids.(K)
4. Describe the types, composition and utilization of vitamins (K)

5. Explain the effect of exercise related biochemical changes and its application to exercise prescription (KH)
- Lecture
 - Tutorial
 - Demonstration using models including digital
 - Flipped class
 - Dissection
 - MCQs
 - Short Essays
 - Spotters

THEORY

SECTION A

Unit 1

1. Acid-Base balance -

1. Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.

2. Carbohydrate Chemistry –

1. Definition, general classification with examples, Glycosides bond
2. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides.
3. Glycosaminoglycan (mucopolysaccharides)
4. Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.

Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle
Hormonal regulation of glucose, Glycosuria, Diabetes mellitus

5. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers

3. Lipid Chemistry –

5. Definition, general classification
6. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol
7. Essential fatty acids and their importance
8. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies
9. Role of lipids in diet

3. Amino-acid Chemistry –

1. Amino acid chemistry: Definition, Classification, Peptide bonds
2. Peptides: Definition, Biologically important peptides
3. Protein chemistry: Definition, Classification, Functions of proteins,
4. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non- essential amino acids. Nitrogen balance

4. Nutrition –

1. Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food.
2. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person
3. Balanced diet
 1. Recommended dietary allowances
 2. Nutritional disorders.

SECTION B

5. Enzymes –

1. 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 -

1. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.

2. 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.

3. .

7. Vitamins -

1. Definition, classification according to solubility,

2. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.

8. Mineral Metabolism-

1. 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.

9. Clinical Biochemistry -

1. 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.

Recommended Text Books

1. Textbook of Biochemistry- Chatterjee M.N.-Jaypee Brothers.
2. Textbook of Biochemistry for Medical Students Vasudeval D.M. Jaypee Brothers.
3. Clinical Biochemistry- metabolic & Clinical aspects- Marshall & Bangert- Churchill Livingstone.
4. Biochemistry Southerland-Churchill Livingstone.

Recommended Reference books

1. Drugs in Sports: David R. Mottram and Sally Gunnel E. & F.N. Span.
2. Normal and Therapeutic Nutrition Robison H. Cortinne et al.; Mac Millian Publish Company, New York.
3. Physiological Chemistry. By Harpar

Course Title: FUNDAMENTALS OF EXERCISE MODALITIES

Subject Description and instruction to teacher

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. 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. The emphasis should be giving hands on training on execution of various types of exercises and passive procedures. Besides lecture and demonstration the emphasis should be placed on making the student capable to perform the exercise procedures independently using DOAP[demonstrate , observe , assist , perform] model of teaching learning

Course Outcomes: Fundamentals of Physiotherapy

1. Apply the principles of physics in describing movements (Force, inertia, Laws of motion) (KH)
2. Explain planes and axis of movements (KH)
3. Discuss the methods of measuring joint movements (KH)
4. Demonstrate joint movement measurements (Including electronic goniometer) (SH)
5. Demonstrate fundamental and derived positions and muscle actions (SH)
6. Demonstrate transfer techniques (SH)

7. Perform basic assessment techniques (Motor, sensory, coordination and balance) (SH)
8. Demonstrate knowledge and skills in prescribing basic movement aids (SH)
 - Lecture
 - Flipped class
 - Video demonstration
 - Demonstration
 - Lab works
 - MCQs
 - Short Essay
 - Assignments
 - Viva Voce
 - OSPE

SECTION A

- Describe the aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, and Assessment of patient's condition – Measurements of Vital parameters
- Apply the principles of mechanics applied to Exercise Therapy: Force, Composition, Resolution, Equilibrium- stable, unstable, neutral gravity-LOG-COG, levers-types, Speed, velocity, work, energy, power, acceleration, momentum, friction and inertia
- Discuss Muscle work group action of muscles, angle of pull and mechanical efficiency of the muscles.

Unit 2: Starting and Derived Positions

- Demonstrate the starting positions, their muscle work, effects and uses and Standing, Kneeling, Sitting, Lying and Hanging.
- Demonstrate derived positions. Discuss the muscle work of each derived position

Unit 3: Measurement of Joint Range

- Demonstrate Different methods of measuring range of motion (ROM).
- Discuss Reliability and validity of goniometry. Functional ROM and normal range of motion of various joint. Technique of Goniometry.
- Perform ROM measurement of individual joint's using goniometer.

SECTION B

Unit 4: Muscle testing

- Discuss the Principles & Aims, Indications & Limitations, and Techniques of MMT for group & individual testing
- Demonstrate Manual Muscle testing procedure
- Perform MMT for upper limb, lower limb spine and face muscles

Unit 5: Classification of therapeutic exercise

- Classify therapeutic exercises: Technique, effects, therapeutic use
- Demonstrate Active Movements
- Discuss active movements in terms of Definition of strength, power & work, endurance, muscle actions, Causes of decreased muscle performance,
- Explain the Physiological adaptation to training: Strength & Power, Endurance.
- Demonstrate Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses
- Demonstrate Active Assisted Exercise:
- Discuss the principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses

- Demonstrate Resisted Exercise:
- Discuss the principles, indications, contraindications, precautions & techniques, effects and uses
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
- Demonstrate Passive Movements
- Discuss 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

Demonstrate Mobilization exercises of the joints region-wise- passive, active

Unit 4

- Classify various types of soft tissue manipulation techniques.
- Discuss Physiological effects, therapeutic effects and contraindications of soft tissue manipulation.
- Describe effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.
- Perform effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

PRACTICAL

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory.

List of practical (student shall be able to perform independently)

1. Demonstrate the different types of muscle contraction, muscle work, group action of muscles and co-coordinated movements on self
2. Demonstrate various fundamental and derived positions. And describe muscle work, and uses on self

3. Measure the ROM of joints using hand held goniometer – upper limb, lower limb & trunk on human model
 4. Demonstrate the relaxed passive movement of joints of upper limb and lower limb on human model
 5. Instruct the patient to perform of the active mobilisation exercises of joints of upper limb and lower limb on human model
-
1. Perform passive mobilisation exercises of different joints region wise on self / human model
 2. Demonstrate the testing of muscle strength/ function region wise – upper limb, lower limb and trunk On human model
 3. Perform all the soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face On human model
 4. Demonstration ONLY [to be shown to the student by the teacher]
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1. Digital goniometry
 2. Pelvic inclinometry
 3. Dynamometry
 4. Accessory passive movement

Recommended Text Books

1. Principle of Exercise Therapy -Gardiner - C.B.S. Delhi
2. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
3. Therapeutic Exercises Foundations and Techniques - Kisner and Colby -F.A. Davis.
4. Principles and practices of therapeutic massage – Sinha 3rd edition. Jaypee brothers Delhi
5. Margaret Hollis-Textbook of Massage.
6. Muscle testing and functions - Kendall - Williams & Wilkins.
7. Daniels and Worthingham's - Muscle testing - Hislop & Montgomery - W.B. Saunders.
8. Measurement of Joint Motion: A Guide to Goniometry - Norkins& White - F.A. Davis.

Recommended reference books

1. Therapeutic Exercises - Basmajian - Williams and Wilkins.
2. Licht SH, editor. Massage, manipulation, and traction. E. Licht;
3. World Health Organization; Global Strategy on Diet, Physical Activity and Health
4. McArdle WD, Katch FI, Katch VL. Exercise physiology: nutrition, energy, and human performance. Lippincott Williams & Wilkins; 2010.
5. Kennedy-Armbruster C, Yoke M. Methods of group exercise instruction. Human Kinetics; 2014.
6. ACSM's Guidelines for Exercise Testing and Prescription

COURSE CODE BPT 105

Course Title: Fundamentals of Electro Physical Agents

Subject Description and instruction to teacher

The aim of this course is to familiarize the students to the concept and basic principles of physics related to electrotherapy. The student will be taught about physics related to electrotherapy and application on human body tissues. In this course the student will learn the Principles, Techniques, and Effects, Indication, Contra-Indication and the dosage parameter for various electro therapeutic modalities. The objective of this course is that after attending the 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

Course Outcomes:

After completion of this course the student shall be able to

Outcomes

Teaching learning methods

Assessment

1. Explain fundamental principles of physics related to electricity production, its transmission.

2. Explain the production, physiological and therapeutic effects Biophysics, principles, therapeutic uses, indications, contra-indications electrical stimulation agents
3. Demonstrate competencies in operational skills of equipment and patient preparation and techniques of application of electrical stimulation agents
4. Discuss the physiology and pathophysiology of pain.
5. Discuss theories of pain and its implications to physiotherapy clinical decision making.
6. Explain physiological effects, therapeutic uses, indications, contraindications and demonstrate practical/operational skills required
Demonstrate competencies in equipment maintenance, care and safety- precautions

- Lecture
- Flipped class
- Video demonstration
- Demonstration
- Lab works
- MCQs
- Short Essay

- Viva Voce
- OSPE

THEORY

SECTION A

Unit 1

Physical Principles In Relation to Physiotherapy

Structure and Properties of matter-solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.

Structure of atoms, molecules, elements and compounds, electron theory, static and current electricity.

Conduction, Insulators, Potential difference, Resistance and Intensity.

Ohm's Law its application to AC and DC currents.

Rectifying Devices-Thermionic valves, semiconductors, Transistors, Amplifiers, Transducers, Oscillator Circuits.

Capacitance, Condensers in DC and AC circuits.

Display devices and indicators-analogue & digital

Effects Of Current Electricity

Chemical effects- ions and electrolytes, ionization, production of E.M.F by chemical actions.

Magnetic effects, Molecular theory of Magnetism. Magnetic fields, electromagnetic induction.

Milli ammeter and voltmeter, transformers and choke coil, thermal effects-joules law and heat production.

Physical principles of light and its properties.

Physical principles of sound and its properties.

Electromagnetic spectrum-biophysical application.

Electrical Supply

Brief outline of main supply of electric current.

Dangers short circuits, electric shocks.

Precautions safety devices, earthing, fuses etc.

First and initial management of electric shock.

Unit 2

Low Frequency Currents

- Introduction to direct, alternating and modified currents.

Iontophoresis: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation.

Faradic current: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation

Interrupted direct current: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation

Transcutaneous Electrical Nerve Stimulations (TENS)

1. Types of low frequency, pulse widths, frequencies and intensities used as TENS applications.
2. Theories of pain relief by TENS.
3. Principles of clinical application, effects and uses, indications, contraindications, precautions. Operational skills of equipment and patient preparation.

SECTION B

Unit 3

Electrical Reactions and Electro-Diagnostic Tests

Electrical stimuli and normal behavior of nerve and muscle tissue.

Types of lesion and development of reaction of degeneration.

Faradic/Intermittent direct current test.

S.D. Curve and its application.

Chronaxie, Rheobase and pulse ratio.

Unit 4

Infrared rays-Wavelength, frequency, types and sources of IRR generation techniques of irradiation, physiological and therapeutic effects indications, contraindications, precautions, Operational skills of equipment and patient Preparation.

Superficial Heat: Paraffin wax bath, moist heat, electrical heating pads.

1. Mechanism of production.
2. Mode of heat transfer.
3. Physiological & therapeutic effects.
4. Indications, contraindications, precautions, operational skills of equipment and patient preparation.

PRACTICAL

The students of are to be trained in Practical Laboratory work for all the topics discussed in theory.

List of practical (student shall be able to perform independently)

- 1) Identify components and safety devices involved in electric supply of the electrotherapy department.
- 2) Experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.
- 3) Locate and stimulate different motor points region wise including the upper & lower limb, trunk face. On human model
- 4) Demonstrate the application of special techniques of low frequency current including Faradic foot bath, faradism under pressure
5. Demonstrate the application of techniques of Iontophoresis.
- 6) Demonstrate the plotting of strength duration curve and find out Chronaxie and Rheobase.
- 7) Demonstrate the techniques of application of various types of IR lamps to various body regions.
- 8) Demonstrate the techniques of application of paraffin wax bath to various body regions
- 9) Demonstrate the techniques of application of TENS to various body regions

Recommended Text Books

1. Electro therapy Explained: Principles & Practice Low& Reed, Butterworth Heinemann.
2. Claytons Electro therapy, Forster & Palastange Baillier Tindal.

Recommended reference books

- 1.Principles & Practice of Electrotherapy, Kahn, Churchill
- 2.clinical electrotherapy Currier and nelson
- 3.Therapeutic Heat & Cold, Lehmann, Willians& Wilkins.

Livingstone

COURSE TITLE- PSYCHOLOGY AND SOCIOLOGY

SECTION A

Course Title : Psychology

Subject Description and instruction to teacher

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.

Course Outcomes:

After completion of this course the student shall be able to

General and Clinical Psychology

1. Describe the principles of psychology and its relationship to human behaviour (K)
2. Discuss the theories of psychology and its implications to health.(KH)

3. Discuss physiology of emotions and its applications in health care (KH)
4. Explain the theories of motivation (KH)
5. Discuss the theories, concepts, development and assessment of personality.(KH)
6. Explain the concepts of intelligence and its assessment(KH)
7. Describe the psychological concepts of frustration. (K)
8. Apply the principles of psychology in clinical decision making. (KH)

THEORY –

UNIT 1: Introduction to Psychology

- Describe Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
- Describe Methods: Introspection, observation, inventory and experimental method.
- Describe in brief Branches: pure psychology and applied psychology
- Describe importance of study of Psychology to physiotherapy

Unit 2: Developmental Psychology

- Describe Growth and Development Nature of growth and development, Characteristics of growth and development. Developmental periods of infancy.
- Describe Childhood, adolescence, adulthood and old age, Factors affecting growth and development.
- Describe Role of heredity and environment and their relative importance in physical, psychological and social development

Unit 3: Emotions and perception

- Describe Emotions Concept and definition, Theories of emotions, Physiological changes due to emotional state. Nature and control of anger, fear and anxiety.
- Describe Sensation, attention and perception Meaning and definition.
- Describe Types of sensation and Perception.
- Describe Principles of Perception. Illusion and hallucination concept of attention and Factors determining attention.

Unit 4: Motivation and Learning

- Definition, needs, drives and motives, primary motives and secondary motives, Achievement motivation.

- Discuss the theories of motivation.
- Describe theories of Learning
- Describe Concepts, Characteristics, Types, Laws of Learning, Theories of learning, Trial and Error theory,
- Describe Conditioning-classical and operant, Insight theory of learning, Factors influencing learning.
- Describe 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.
- Describe Intelligence; Discuss Characteristics, Types. IQ. Mental age.
- Describe Assessment of intelligence, intelligence tests-verbal and performance test
-

Unit 5: Psychology of frustration and Stress

- Describe Frustration and stress under the following headings: Definition. Causes, Sources of frustrations, Conflict, Different types of conflicts, Adjustment and maladjustment. Defense Mechanism.

- Describe Different types of Anxiety, Tension, Physiological symptoms, causes reactions to stresses, psycho-somatic problems, coping strategies.
- Discuss the management of stress

Unit 6: Personality

- Define Personality and describe factors in personality development
- Describe tools of Measurement of Personality:- observation, situational test, questionnaire, rating scale, interview, and projective techniques.
- Describe Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.
- Describe psychological reactions of a patient during admission and treatment in terms of possible Anxiety, shock denial, suspicion. Loneliness, shame, guilt, rejection, fear, withdrawal, depression, egocentric, justify and loss of hope.
-

Unit 7: Social psychology

- Describe Different types of leaders and Different theoretical approaches to leadership.

- Describe development of attitude and Change of attitude.

Unit 8: Clinical psychology

- Describe Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression,
- Discuss the following
 - Self-imaging
 - stress management
 - assertive training
 - Group therapy
 - Body awareness
 - Pediatric, child and geriatric clinical psychology.

Recommended Text Books:

1. Morgan C.T. & King R.A. Introduction to Psychology– recent edition [Tata McGraw-Hill publication]
2. Munn N.L. Introduction to Psychology [Premium Oxford, I.B.P. publishing.]
3. Clinical Psychology –Akolkar
4. Hurlock EB. Development psychology. McGraw-Hill;

Recommended reference books

1. Psychology Indian continent edition Raron RA mishra 2018
2. Abnormal Psychology Sarason IG Sarason BR Prentice Hall India
3. Introduction to psychology Atkinson RL Hilgard ER 2019
4. Development a lifespan approach Johnson ML 2020 Pearson education
5. Abnormal psychology an integrative approach Thomson brooks / Cole publishing
6. Theories of counselling and psychotherapy a case approach Murdock nl person education New Zealand
7. Theories of personality. Hall CS, Lindzey G Wiley and sons inc

SECTION B

Course Title: Sociology

Subject Description and instruction to teacher

The purpose of this course is to introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community. The student should be sensitized to the influences of various social factors in health and disability. Besides class room Lecture the Case studies, Field visit, role play, debates and Panel discussions should be used to generate interest and make the subject meaningful.

Course Outcomes:

After completion of this course the student shall be able to

Sociology

1. Discuss the sociological concepts in relations to health, health care, and disorders.(KH)
9. Explain social theories in relations to health and health care.(KH)
10. Discuss biomedical and biopsychosocial health models.(KH)
11. Explain Concept of social groups, influence of groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings (KH)
12. Discuss the influence of family on human personality, individual's health, family and nutrition and the effects of sickness on family along with psychosomatic disease
13. Analyse the social cause for activity limitations and participatory restrictions caused by various disorders.(KH)

- Lecture
- Case studies
- Field visit
- Role play
- Debate
- Panel discussions
- Short Essay
- Assignment
- Presentations
- Debate

THEORY

Unit 1

1. Introduction:
2. Meaning- Definition and scope of sociology
 3. Its relation to Anthropology, Psychology, Social Psychology.
 4. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.
 5. Importance of its study with special reference to Health Care Professionals.
10. Social Factors in Health and disease situations:
 1. Meaning of social factors
 2. Role of social factors in health and illness
11. Socialization:
 1. Meaning and nature of socialization.
 2. Primary, Secondary and Anticipatory socialization.

3. Agencies of socialization.

12. Social Groups:

1. 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 rehabilitation setup.

13. Family:

1. The family, meaning and definitions.

2. Functions of types of family

3. Changing family patterns

4. 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.

Unit 2

14. Community:

1. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.
2. Urban community: Meaning and features- Health hazards of urbanities.

15. Culture and Health:

1. Concept of Health
2. Concept of Culture
3. Culture and Health
4. Culture and Health Disorders

16. Social change:

1. Meaning of social changes.
2. Factors of social changes.
3. Human adaptation and social change
4. Social change and stress.

5. Social change and deviance.
 6. Social change and health programme
 7. The role of social planning in the improvement of health and rehabilitation.
17. Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.
1. Population explosion
 2. Poverty and unemployment
 3. Beggary
 4. Juvenile delinquency
 5. Prostitution
 6. Alcoholism
 7. Problems of women in employment
 8. Geriatric problems
 9. Problems of underprivileged.
18. Social Security:
1. Social security and social legislation in relation to the disabled.

Recommended Text Books

1. McGee - Sociology - Drydon Press Illinois.
2. Kupuswamy - Social Changes in India - Vikas, Delhi.
3. Ahuja - Social Problems - Bookhive, Delhi.
4. Ginnsberg - Principles of Sociology - Sterling Publications.
5. Parter & Alder - Psychology & Sociology applied to medicine - W.B. Saunders.
6. Julian - Social Problems - Prentice Hall. Indian Social Problems - Madan, Vol-I-Madras
7. Bhushan, V., & Sachdeva, D. R. (2005). *Introduction to sociology*. Kitab Mahal.

Recommended Reference Books

1. Sociology Anthony gidden
2. Sociology themes and perspectives Haralambos and holborn
3. Society an introductory analysis Maclaver and page
4. Rules of sociological methods emile durkeim
5. Essay on sociology max webber
6. Sociological imagination C wright mills

COURSE TITLE- FUNDAMENTALS of Health care delivery System In India

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:

SECTION-A

- 1.Introduction to healthcare delivery system
- 2.Healthcare delivery system in India at primary, secondary and tertiary care
- 3.Community participation in healthcare delivery system
- 4.Health system in developed countries.
- 5.Private Sector
- 6.National Health Mission
- 7.National Health Policy
- 8.Issues in Health Care Delivery System in India

SECTION- B

- 1.National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.
- 2.Health scenario of India- past, present and future
- 3 Introduction to the profession of physiotherapy role of physiotherapy in national health issues and the expectations of society from physiotherapists
- 4 The concepts of health and disease, risk factors, and the role of health promotion and disease prevention
- 5 Explore the corporatization of health care.
6. Identify the globalisation of health care.
7. Assess the prospects of new health care reform .
- 8 Understand various types of health services professionals and their training, practice requirements, and practice settings.
- 9 Differentiate between primary care and specialty care, and identify the causes of the imbalance between primary care and specialty care
- 10 Study the role of health care financing and its impact on the delivery of health care.
- 11 Understand the basic concept of insurance and how general insurance terminology applies to health insurance.

COURSE CODE- 108

COURSE TITLE - ENGLISH, COMMUNICATION AND SOFT SKILLS

Subject description The objective of this course is to enable the student to effectively communicate with patient, colleague and professional. The student will also be able to understand and implement the basic communication skills required for personal, hospital, and department management and interpersonal management.

Course outcomes

CO 1 apply basics of grammar and writing skills apply and communicate ideas orally and in writing with a high level of proficiency
use appropriate expressions in varied situations and topics of interest ,speak in English both in terms of fluency and comprehensibility
demonstrate independence in using basic language structure in oral and written

Major topics to be covered under Communication course –

SECTION A

1. Basic Language Skills: Grammar and Usage.
2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.
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

SECTION-B

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.
8. Communication methods for teaching and learning.
9. Communication methods for patient education.
10. Barriers of communication & how to overcome.

COURSE CODE- 109

COURSE TITLE- 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:

Course outcome

CO 1 know the parts of computer

CO 2 have working knowledge of a computing system

CO3 use computer for word processing and presentation and data management

CO4 use the internet for personal and professional purpose

CO5 understand the role of digital technology in the health sciences

SECTION A

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

SECTION-B

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.

10 Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

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.

12 Application of Computers in clinical settings.

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

CLINIC ORIENTATION AND 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. Clinical visit to their respective professional department within the hospital

2ND YEAR B.P.T.

Course Code: B.P.T-201

SUBJECT DESCRIPTION: COURSE TITLE - PATHOLOGY AND MICROBIOLOGY

Subject Description and instruction to teacher

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.

Course Outcomes:

Course outcomes

Teaching – Learning Methods

Assessment

Pathology and Micro biology

1. Explain important pathological processes including cell death and injury, inflammation, thrombosis and neoplasia. (KH)
2. Discuss the relationship between pathological process and pathogenesis of musculoskeletal, cardio-vascular, neurological and oncological diseases. (KH)

3. Describe the predisposing factors, causes, pathogenesis, morphology, and complications of musculoskeletal, cardio-vascular, neurological, and oncological diseases. (K)
4. Discuss the clinical features in relation to causes and pathogenesis of the diseases. (KH)
5. Describe the classification and characteristics of microorganisms' cause's diseases.(K)
6. Describe the reproduction of common bacterial, fungal, viral pathogens. (K)
7. Discuss the mechanism of infectious disease and body's immune defense. (KH)
8. Explain infection control practices that prevent the spread of infection (KH)
9. Discuss the process of infection and mechanism create a sterile field in physiotherapy practice (KH)

- Lecture
- Tutorial
- Demonstration using models including digital tools
- Flipped class
- MCQs

- Assignments
- Short Essays
- Long essay

SECTION A

THEORY

UNIT 1

- Discuss the Causes of disease, cell injury
- Describe the mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene
- Explain the pathology inflammation
- Differentiate acute and chronic inflammation
- Explain the process of primary healing, secondary healing
- Discuss the factors affecting healing and repair of soft tissues and skin.

UNIT 2

- Describe Fluid and hemodynamic derangements
- Discuss the pathophysiology of edema, hyperemia, Hemorrhage, shock, embolism, thrombosis, and infarction
- Discuss Immune mechanisms (natural and acquired)

- Discuss the features of autoimmune diseases and immunodeficiency diseases.
- Discuss the characteristic of benign and malignant tumors
- Describe grading and staging of malignant tumors
- Describe general effects of malignancy on the host
- Outline the carcinogenic agents
- Outline the methods of diagnosis of malignancy
- Classify the Nutritional disorders
- Discuss the deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E,K) iodine deficiency)
- Discuss the effect of nutrition deficiency on skeletal muscles, bones and neurological functions

- Describe the hypersensitivity reactions

UNIT 3

- Discuss the causative factors, pathology, clinical features, diagnosis and management of Disorders of blood

- Discuss the causative factors, pathology, clinical features, diagnosis and management of Disease of circulatory system (atherosclerosis, thromboangitis obliterans, varicose vein, DVT, thrombophlebitis, lymphedema, congestive cardiac failure, rheumatic heart disease,)

- Explain the causative factors, pathology, clinical features, diagnosis and management of ischemic heart disease
- Explain the causative factors, pathology, clinical features, diagnosis and management of Congenital Heart disease.
- Explain the causative factors, pathology, clinical features, diagnosis and management of Disease of Respiratory System (Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Occupational lung diseases, Carcinoma of lungs)
- Explain the causative factors, pathology, clinical features, diagnosis and management of Disorders of musculoskeletal system. (Arthritis-rheumatoid, degenerative, infective, metabolic. osteoporosis, pagets disease, osteogenesis imperfecta, osteomyelitis, a brief outline of bone tumors. Muscular dystrophy, myasthenia gravis, myositis.)
- Explain the causative factors, pathology, clinical features, diagnosis and management of Diseases of Nervous system. (Meningitis, encephalitis, vascular diseases of brain, peripheral nerve lesions. Degenerative diseases parkinsonism , Alzheimer's disease)
- Describe the causative factors, pathology, clinical features, diagnosis and management of Diseases endocrine system. (Diabetes Mellitus:, Thyroiditis, Thyrotoxicosis, myxedema.)
- Describe the causative factors, pathology, clinical features, diagnosis and management of the Disorders of blood (anemias, Leukemia)
 - Describe the causative factors, pathology, clinical features, diagnosis and management of the Disorders atherosclerosis, thromboangitis obliterans, varicose vein, DVT

SECTION -B

UNIT 4 •Classify microorganisms

- Discuss the type, source and mechanism of Infection

- Describe the prevention and management of common infections
- Describe the causative factors, and pathology of common Infectious diseases:
- Outline of the management of common infective diseases
- List the causative factors, pathology, clinical features, diagnosis and management of Bacterial disease (Diphtheria, Whooping Cough Tetanus Pyogenic, Diphtheria, Gram negative infection, bacillary dysentery. STD Gastroenteritis, Food Poisoning Tuberculosis, Leprosy, Syphilis)
- Describe the causative factors, pathology, clinical features, diagnosis and management of viral diseases: (Poliomyelitis, Herpes, Rabies, Measles, Ricketts, Chlamydial infection, HIV infection. Chicken Pox, Measles, Mumps, Influenza)
- Describe the causative factors, pathology, clinical features, diagnosis and management of Fungal and opportunistic infections.
- Describe the causative factors, pathology, clinical features, diagnosis and management of: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

Recommended Text Books

1. Cotran, Kumar & Robbins Robbins Pathological Basis of Disease - - W.B. Saunders.
2. Harsh Mohan Text book of Pathology - - Jaypee Brothers.
3. Goodmann and Boissonnault Pathology: Implications for Physical Therapists - - W.B. Saunders.
4. Bhatia & Lal Essential of Medical Microbiology - - Jaypee Brothers.
5. Medical Microbiology - Mims - Jaypee Brothers.

Recommended reference books

1. Walter & Israel , General Pathology - - Churchill Livingstone.
- 2.. Anderson Muirs Textbook of Pathology - - Edward Arnold Ltd.
3. Ackerman and Richards - Microbiology: An Introduction for the Health Sciences – W.B. Saunders

COURSE CODE BPT-202

Course Title- PHARMACOLOGY

Subject Description and instruction to teacher

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. Details of chemistry of molecules should be avoided.

Course Outcomes:

Pharmacology

1. Describe the concepts of pharmacology (including pharmacokinetics and pharmacodynamics) of commonly used drugs.(K)
2. Discuss the effects of commonly used drugs on body function.(KH)
3. Discuss the therapeutic and adverse effects, contraindications, and precautions for commonly used drugs.(KH)

4. Discuss the pharmacological effects of drugs used in the management pain, inflammatory, cardio-vascular, respiratory, neurological and oncological disorders. (KH)
 5. Explain the effect of commonly prescribed on exercise and movement.(KH)
 6. Identify the red and yellow flags for physiotherapy prescription based on the pharmacological effect of commonly prescribed drugs. (KH)
- Lecture
 - Tutorial
 - Demonstration using models including digital tools
 - Flipped class

 - MCQs
 - Assignments
 - Short Essays
 - Long essay

SECTION -A

Unit 1: General Pharmacology

- Define and, Classify drugs.
- Describe Sources of drugs, Routes of drug administration, Distribution of drugs,
- Discuss Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, adverse effects.

Inflammatory/Immune Diseases -

- Describe Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non aspirin NSAIDs, drug Interactions with NSAIDs
- Discuss Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
- Discuss Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
- Discuss Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematosus, Scleroderma, Demyelinating Disease

UNIT 2: Autonomic Nervous system

- Describe General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
- Discuss cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

Cardiovascular Pharmacology –

- Describe Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors
- Describe Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
- Describe Antiarrhythmic Drugs
- Discuss the Drugs used in the treatment of vascular disease and tissue ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics
- Discuss the Drugs used in the treatment of Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease

SECTION -B

UNIT 3: Neuropharmacology

- Discuss Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
- Describe Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
- Discuss Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
- Describe Antipsychotic drugs
- Disorders of Movement -
 - Discuss Drugs used in Treatment of Parkinson 's disease
 - Describe Antiepileptic Drugs
 - Discuss Spasticity and Skeletal Muscle Relaxants
- Discuss Respiratory Pharmacology and Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

UNIT 4

- Describe Gastrointestinal Pharmacology and drugs used in Peptic Ulcer Disease, Constipation, and Diarrhea Drugs
- Describe Hormones and drugs affecting endocrine functions Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic
- Geriatrics -
 - Discuss the adverse effects of special concern in the Elderly, Dementia, and Postural hypotension.
 - Describe chemotherapeutic agents

Recommended Text Books

1. Udaykumar P. Pharmacology for physiotherapy. Jaypee Bros. Medical Publishers;2011.
2. Ramesh KV, Shenoy KA. Pharmacology for Physiotherapist. Jaypee Brothers

Medical Publishers Pvt. Limited;2005.

3. . Tripathi KD. Essentials of medical pharmacology. JP Medical Ltd;

Recommended reference books

1. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan.
2. Satoskar RS, Rege N, Bhandarkar SD. Pharmacology and pharmacotherapeutics.Elsevier India; 2017

Course Code : 203

Course Title : Public Health & Health Promotion
Subject Description and instruction to teacher

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 and the methods of health administration, and be able to appreciate role of health education and disease preventive measures in keeping the population healthy .

Course Outcomes:

After completion of this course the student shall be able to

1. Discuss the determinants of health in relation to the local context
2. Discuss National health policy, programmes and its application to physiotherapy practice
3. Explain the health care delivery system of India.
4. Describe the role of individual, family and community on health
5. Discuss the levels of prevention and its application in health care delivery
6. Explain basic epidemiological principles of health
7. Discuss the prevention of communicable and non-communicable diseases.

THEORY

SECTION -A

Unit 1

1. Health and Disease: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine,
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.

Unit 2

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.
5. Health programmes in India: Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme.
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.
7. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics: MCH problems, Antenatal, Intranatal and post-natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare programmes for women and children, Preventive medicine and geriatrics.

SECTION -B

Unit 3

8. Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes.
9. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.
10. Hospital waste management: Sources of hospital waste, Health hazards, Waste management.
11. Disaster Management: Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.

Unit 4

12. Occupational Health: Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts.
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.
14. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.
15. Exercise As Preventive Medicine: for Old age, Working Population, Adolescents and Children. How to keep your Society fit.

Recommended text books

1. Park K: Park's textbook of preventive and social medicine. 24th Ed, M/s Banarasidas Bhanot, Jabalpur, 2017
2. Rao SB: Principles of community medicine. 4th Ed, AITBS Publishers & distributors, New Delhi, 2005.
3. Rahim A: Principles and practice of community medicine. 1st Ed, Jaypee brothers, New Delhi. 2008.
4. Gupta MC & Mahajan BK: Textbook of preventive and social medicine. 3rd Ed, Jaypee Brothers, New Delhi, 2003

Recommended reference books

1. Matzen RN, Lang RS: Clinical preventive medicine. Mosby, Missouri,
2. Abramson JH, Abramson ZH: Survey methods in community medicine, Churchill Livingstone, Edinburgh,
3. Jekel JF, Katz DL, Elmore JG: Epidemiology, Biostatistics and Preventive Medicine, 2nd Ed, Saunders, Philadelphia, 2001.

COURSE CODE 204

Course Title: Basics of Emergency Care and Life Support Skills

Subject Description and instruction to teacher

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. The purpose of this course is to equip the students with the skill to save the life of a person in different emergency situation as first responder . The training should be provided using Mannequins and dummies and Videos presentations and Role plays should be also used to impart knowlwdge and skill besides the lecture - demonstrations .

Course Outcomes:

After completion of this course the student shall be able to

1. Perform Opening and maintaining and patent airway: assessment and knowledge of airway maneuvers and adjuncts
2. Ventilate patients: Assessment and management of breathing with Mouth to mouth and mouth to mask
3. Administer basic life support skills including cardiopulmonary resuscitation
4. Provide first aid of simple and multiple system trauma such as • Controlling hemorrhage • Managing Burns and wounds • Response to effects of weapons of mass destruction • manually stabilizing injured extremities

5. Provide first aid to patients with medical emergencies like heart attack and stroke • Identifying signs of Stroke and heart attack and safe transfer after first aid without delay in transfer. • Manage general medical complaints seizures and animal bites (snake /dog bite)
6. Reassure patients and bystanders by working in a confident, efficient manner • Avoid mishandling and undue haste while working expeditiously to accomplish the task
7. Manage safe patient transport entailing-Extrication of the victim, helmet removal and spine protection during transport.
8. Explain Roles, responsibilities and limitation of first responder.

SECTION -A

UNIT 1

1. Emergent conditions and magnitude, Concept of golden hour, Duties and responsibilities of first responder
2. ethical issues and Gather information from observation, experience and reasoning f. Identification of rapidly changing situations and adapt accordingly g. Planning and organization of work h. Scene safety i. Dealing with emotional reactions family members and bystanders
3. well-being of first responder Personal protection
 - i. Steps to be taken against airborne and blood-borne pathogens
 - ii. Personal protective equipment necessary for each of the following situations:
 - Hazardous materials
 - Rescue operations
 - Violent scenes
 - Crime scenes
 - Electricity
 - Water and ice

Exposure to blood-borne pathogens

Exposure to airborne pathogens

UNIT 2

4. Airway

- a. Signs of inadequate breathing
- b. Mechanism of injury to opening the airway
- c. Steps in the head-tilt chin-lift
- d. Steps in the jaw thrust
- e. Taking out foreign body
- f. Ensuring patent airway during seizures and vomiting.

5. Ventilation

- a. Of a patient with a mask or barrier device
- b. Steps in providing mouth-to-mouth and mouth-to-stoma ventilation

6. Circulation

- a. Evaluate the cardiac status of the patient
- b. Determine the need for and take necessary action to proper circulation
- c. Steps for control of bleeding: Pressure bandage and tourniquet

7. Clearing a foreign body airway obstruction

8. CPR

a. Implications of cardiac arrest

b. Cardiopulmonary resuscitation (CPR)

i. How it works

ii. Steps

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iii. When to stop CPR

c. Brief overview of AED Automated external defibrillator (only demonstration –no hands on)

SECTION -B

UNIT 3

9. Bleeding and Soft Tissue Injuries

- a. Difference between arterial and venous bleeding
- b. Stopping external bleeding
- c. Identification of Internal bleeding
- d. types and Functions of dressings and bandages
- e. How to help a victim of burn injury

10. Injuries to Muscles and Bones

- a. Suspecting bony/spinal injury
- b. Splinting –materials used
- c. Importance of splinting

UNIT 4

10. Medical Emergencies

11. a. Identification of the patient steps in providing first aid to a patient with

- i. A general medical complaint- Seizures
- ii. Chest pain

iii. Shortness of breath

iv. Exposure to heat

v. Including other medical complaints like allergy, diarrhea, fainting, low blood sugar, stroke

b. Drowning

c. Poisoning

12. transportation Importance of timely and proper transportation methods of transportation of victim from site of injury to ambulance 2. Importance of spine protection methods of spine protection during transportation

Disaster preparedness -. Preparedness and risk reduction Incident command and institutional mechanisms Resource management

Practicals

Student should practice on Mannequins and dummies and should be able to

1. Provide Airway & Ventilation
2. Perform Basic Life Support: CPR
3. Perform Initial management of Thermal injury, electric injury
4. Perform stabilizing injured extremity and wound management
5. Demonstrate bandaging techniques to various body parts
6. Demonstrate Extrication, Helmet removal and spine protection
7. Demonstrate Stretcher use

Recommended text books

Indian red cross : INDIAN FIRST AID MANUAL 2016 (7th edition) available at <https://www.indianredcross.org/publications/FA-manual.pdf>

COURSE CODE BPT -205

Course Title : Exercise Therapy

Subject Description and instruction to teacher

the purpose of this course is to provide detailed knowledge and skills about the advanced concepts and methods of exercise therapy - build over the fundamentals concepts taught in the first year such as relaxation , suspension therapy , hydrotherapy , manual therapy , aerobic exercises functional reeducation stretching etc . The basic idea is that after the completion of this course student acquires the skills and knowledge to apply the techniques of exercise therapy in patient care . The emphasis should be giving hands on training on execution of various types of exercises and passive procedures . Besides lecture and demonstration the emphasis should be placed on making the student capable to perform the exercise procedures independently using DOAP [demonstrate, observe, assist, perform] model of teaching learning

Course Outcomes:

Therapeutic Exercise

1. Explain the physiological effects of endurance, strengthening, balance and coordination effects on various systems.(KH)
19. Differentiate types of exercise based on the therapeutic effects. (SH)

20. Discuss the indications, contraindications and precautions to be taken while performing

1. Passive Range of Motion
2. Active Range of Motion
3. Assisted exercises
4. Endurance exercise
5. Strengthening exercise
6. Balance and coordination exercise

21. Demonstrate competencies in prescribing

1. Passive Range of Motion
2. Active Range of Motion
3. Assisted exercises
4. Endurance exercise
5. Strengthening exercise

6. Balance and coordination exercise

 8. Prescribe therapeutic exercise based on the assessment findings. (SH)

 9. Demonstrate competencies in preparing and implementing evidence based exercise protocol for movement impairments under supervision. (SH)

 10. Demonstrate abilities to document the dosage and progression as per the prescribed format (SH)

 11. Communicate the exercise protocol effectively to the stakeholders. (SH)
- Lecture

 - Tutorials

 - Demonstration

 - Performance under supervisor

 - Lab work

 - MCQs

 - Structured Essay

 - OSPE

THEORY

SECTION-A

UNIT 1

RELAXATION

•Discuss 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,

- Discuss the Indications of relaxation, Methods & techniques of relaxation-Principles & uses:
- Demonstrate General, Local, Jacobson's, Mitchel's, additional methods

SUSPENSION THERAPY:

Discuss the principles, indications, contraindications and benefits of suspension therapy

Demonstrate types of suspension therapy – axial, vertical, pendulum; techniques of suspension therapy for upper limb & lower limb

3. FUNCTIONAL RE-EDUCATION

- Discuss the muscle activities of Lying to sitting:
- Demonstrate Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upper limb activities.

4. POSTURE

- Discuss Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education:
- Demonstrate corrective methods and techniques
- Demonstrate skills in Patient education

BREATHING EXERCISES:

- Describe normal breathing
- Discuss types, techniques, indications, contraindications, therapeutic effects and precautions of breathing exercises

Perform Chest expansion measurement and evaluation

6. Group Exercises

- Discuss the advantages and Disadvantages of group exercises
- Demonstrate skills in Organization of Group exercises; Recreational Activities and Sports.

STRETCHING

- Describe terms related to stretching;
- Discuss Tissue response towards immobilization and elongation
- Discuss the determinants of stretching exercise
- Discuss the Effects of stretching, Inhibition and relaxation procedures,
- Discuss the Precautions to be taken and contraindications of stretching.
- Perform passive and active stretching for upper and lower limb muscles

MANUAL THERAPY & PERIPHERAL JOINT MOBILIZATION

- Discuss Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan
- Discuss Biomechanical basis for mobilization,
- Explain the Effects of joint mobilisation, in terms of Indications and contraindications, Grades of mobilization, Principles of mobilization
- Identify red flags for mobilisation
- Perform mobilization for upper limb lower limb, and spine
- Demonstrate clinical reasoning skills in selection and application of manual therapy techniques
- Demonstrate skills in examining joint integrity, contractile and non-contractile tissues

- Identify accessory movements and end feel

- Demonstrate Assessment of articular & extra-articular soft tissue status
 - Myofascial assessment
 - Acute & Chronic muscle hold
 - Tightness
 - Pain-original & referred

- Discuss the principles, Indications, Contra-Indications and evidence for schools of mobilization (Maitland, Mulligan, McKenzie, Muscle Energy Technique, Myofascial stretching, Cyriax, Neuro Dynamics)

- Discuss the Principles, physiological and therapeutic effects of traction

- Discuss the types, indications, contraindications for traction

- Perform manual and mechanical tractions

SECTION-B

Unit 3

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1. HYDROTHERAPY:

- Discuss principles of fluid mechanics as they relate to hydrotherapy;
- Discuss the Physiological and therapeutic effects of hydrotherapy (joint mobility, muscle strengthening and wound care)
- Appreciate the indications, contraindications and precautions to be while providing hydrotherapy care.
- Identify the Types of Hydrotherapy equipment
- Demonstrate skills in handling hydrotherapy

THERAPEUTIC GYMNASIUM:

- Identify the equipment used in the therapeutic gymnasium
- Discuss the usage of identified equipment
- Demonstrate skills in handling the equipment

AEROBIC EXERCISE

- Explain the Physiological response to aerobic exercise
- Discuss the methods of exercise testing
- Explain the Normal and abnormal response to acute aerobic exercise
- Discuss the Physiological changes that occur with training,
- Apply the Principles of Aerobic conditioning program while prescribing exercise

CO-ORDINATION EXERCISE

- Discuss the physiology of Co-ordination
- Appreciate the causes and pathophysiology of Inco-ordination
- Demonstrate Test for co-ordination: (equilibrium test, non-equilibrium test)
- Discuss the Principles of co-ordination exercise.
- Discuss Frenkel's Exercise in terms of its effects, mechanism, indications and Evidence
- Demonstrate skills in prescribing Frenkel's exercise (Prescription progression, home exercise)

Unit 4

MOTOR LEARNING AND FUNCTIONAL RE-EDUCATION:

- Describe Motor Learning:
- Classify of Motor skills
- Discuss the methods of Measurement of Motor Performance
- Discuss the Theories of motor control and its application

Discuss Learning under the following headings

- Learning Environment:
- Learning of skill
- Instruction and augmented feedback Practice Conditions

2. Proprioceptive Neuromuscular Facilitation

- Explain the neurophysiologic principles of PNF
- Discuss the Muscular activity, Diagonals patterns of movement: upper limb, lower limb
- Demonstrate skills in performing PNF components (timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal)
- Demonstrate the following PNF techniques

Contract relax, Hold relax, Rhythmic initiation Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization

3. WALKING AIDS

- Identify different types of walking aids (Crutches, Canes, Frames)
- Discuss Principles of prescribing walking aids

4. Proprioceptive Neuromuscular Facilitation

- Definitions & goals

- Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb
- Procedure: components of PNF
- Techniques of facilitation
- Mobility: Contract relax, Hold relax, Rhythmic initiation
- Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization
- Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal

PRACTICAL

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory.

List of practicals (student shall be able to perform independently on human model)

1. Demonstrate the PNF techniques – patterns [upperlimb lower limb trunk] , special techniques
2. Demonstrate preparation for relaxation training
3. Measure chest expansion and demonstrate various breathing exercises
4. Demonstrate exercises for training co-ordination – Frenkel's exercise

5. Demonstrate techniques for functional re-education lying to side lying , lying to sitting , sitting to standing
6. Assess and train for using walking aids axillary crutch [3 point ,2 point 4 point gait }, elbow crutch walker
7. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
8. Demonstrate the techniques for muscle stretching
9. Assess and evaluate posture and gait
10. Design and conduct aerobic training programme
11. Demonstrate techniques of strengthening muscles using resisted exercises
12. Demonstrate techniques for measuring limb length and body circumference

Observation [Demonstration by the teacher]

1. Techniques of hydrotherapy in hydrotherapy pool
2. Special techniques of relaxation

Recommended Text Books

1. Practical Exercise Therapy: Hollis, Blackwell, Scientific Publications.

2. Therapeutic Exercise: Foundations and Techniques, Kisner & Colby.
3. Principles Of Exercise Therapy: Gardiner
4. Manipulation and Mobilization: Extremities and Spinal Techniques, Edmond, Mosby.
5. Aquatic Exercise Therapy-Bates and Hanson -W.B. Saunders.
6. Hydrotherapy: Principles & Practices, Campion, Butterworth & Heinemann.

Recommended Reference Books

1. Proprioceptive Neuromuscular Facilitation: Voss et al, Williams & Wilkins
2. Orthopedic Physical Therapy: Woods, Churchill Livingstone
3. Manual Examination and Treatment of Spine & Extremities: Wadsworth, Lippincott.
4. Motor Control: Theory and Practical Applications, Shumway Walcott-Lippincott
5. Therapeutic Exercises: Basmajian, Williams &Wilkins.

COURSE CODE BPT 206

Course Title : Electrotherapy

Subject Description and instruction to teacher

This course on electrotherapy is the extension of fundamentals of electrotherapy taught in the previous year. the purpose of this course is impart the theoretical and practical knowledge on the various electro-physical agents commonly used in physiotherapy practice viz, therapeutic ultrasound, shortwave and microwave diathermy, LASER, cryotherapy, and intermittent compression therapy, it also intends to analyse the physiological response to heat gain and loss and understand the role of electro physical agents in various stages of tissue healing. An introduction to the principles of the advanced uses of electrical current in diagnosis of neuromuscular lesions shall be offered along with the conceptual introduction of the techniques of bio-feedback. The emphasis should be given on providing hands on training on the uses of various modalities with intension of making student able to analyse the underlying pathological process and make a rational selection of the modality for treatment.

Course Outcomes:

Outcomes

Teaching Learning methods

Assessment

Electro Physical Agents

1. Explain pathophysiology of inflammation to tissue injury/healing.(KH)
2. Discuss the physiology and pathophysiology of pain. (KH)
3. Discuss theories of pain and its implications to physiotherapy clinical decision making. (KH)
4. Explain the production, physiological and therapeutic effects of **electro physical agents (KH)**
5. Discuss the indications, contraindications and precautions to be taken while applying **electro physical agents (KH)**
6. Demonstrate competencies in applying (selection, dosage calculation, progression) **electro physical agents**
7. Rationalize the use of electro physical agents as appropriate to the stage of healing (SH)
8. Demonstrate competencies in preparing and implementing evidence based electro physical agents' protocol for movement impairments under supervision. (SH)
9. Demonstrate abilities to document the dosage and progression as per the prescribed format (SH)
10. Demonstrate competencies in equipment maintenance, care and safety- precautions (SH)
11. Demonstrate competencies in communicating to the stakeholders effectively. (SH)

- Demonstration
- Performance under supervisor
- Lab work
- OSPE
- MCQs
- Short and Long Essay
- Assignment

SECTION-A

Unit 1: Introduction

- Explain the Physiological responses to heat gain or loss on various tissues of the body.
- Discuss the Physical principles of electromagnetic radiation.
- Discuss the Physics of sound including characteristics and propagation.
- Rationalize the use of electro physical agents as appropriate to the stage of healing

Unit 2: Therapeutic Ultrasound

- Explain the mechanism of Production, biophysical effects, types, therapeutics types, indication, and contraindication, precautions, of therapeutic Ultra sound.
- Calculate dosage of ultrasound for various structures and types of injuries
- Demonstrate the skills in application of Therapeutic ultrasound
- Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

UNIT 2 – Therapeutic LASER

- Discuss the historical background and physical principles of LASER.
- Classify LASER
- Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of LASER therapy
 - Calculate dosage of LASER for various structures and types of injuries
 - Demonstrate the skills in application of LASER
- Demonstrate the skills in handling the equipment including preparation, maintenance and safety
- Discuss the current evidence pertaining to LASER therapy

SECTION-B

Unit 3: Therapeutic Cold (Cryotherapy)

- Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of cryotherapy
- Demonstrate the skills in application of cryotherapy
- Demonstrate the skills in handling the equipment including preparation, maintenance and safety
- Discuss the current evidence pertaining to cryotherapy

Unit 4: Therapeutic mechanical pressure (Intermittent Compression Therapy)

- Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of intermittent compression therapy
- Demonstrate the skills in application of compression therapy

- Demonstrate the skills in handling the equipment including preparation, maintenance and safety.
- Discuss the current evidence pertaining to intermittent compression therapy

Unit 5: Shockwave therapy

- Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of shockwave therapy
 - Demonstrate the skills in application of shockwave therapy
- Demonstrate the skills in handling the equipment including preparation, maintenance and safety.
- Discuss the current evidence pertaining to intermittent shockwave therapy

Unit 6: Case Discussion on EPA

- Design a management protocol for a clients with identified impairments, activity limitations and participatory restrictions.

Recommended Text Books

1. Electrotherapy Explained: Principle and Practice, Low and Reed, Butterworth Heinemann.
2. Claytons Electrotherapy -Kitchen and Basin.
3. Principles and Practice of Electrotherapy -Kahn Church hill Livingstone.

Recommended reference books

1. Therapeutic Heat and Cold Lehman- Williams and Wilkins.
2. Electrotherapy: Clinics in Physical therapy- Wolf Churchill Livingstone.

COURSE CODE BPT -207

Course Title : BIOMECHANICS & KINESIOLOGY-

Subject Description and instruction to teacher

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.

Course Outcomes:

After completion of this course the student shall be able to

Biomechanics and Kinesiology

1. Discuss the principles of physics and laws related to human movement.(KH)
2. Demonstrate understanding of functional movement (kinetics and kinematics) of human body. (SH)
3. Identify the relationship between structure, function, and mechanical properties of movement system (SH)
4. Analyse the components of human movement both in normal and pathological conditions. (SH)

5. Apply the principles of movement analysis in understanding normal and abnormal gait and posture. (SH)
6. Perform basic movement analysis to identify gait and postural abnormalities.(SH)
7. Apply the principles of biomechanics in designing physiotherapy protocols. (SH)
8. Interpret data obtained from movement analysis such as gait and postural analysis. (KH)

- Lecture
- Flipped class
- Video demonstration
- Demonstration
- Lab works
- MCQs
- Short Essay
- Assignments
- Viva Voce

- OSCE

SECTION-A

THEORY

Unit 1: Basics of Bio-mechanics

- Discuss the basic Concepts in Biomechanics: Kinematics and Kinetics in following terms
 - 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
 - ²⁴⁸n. Moment arm of force
 - o. Force components

Introduction to Biomechanical Analysis:

- Discuss the techniques of biomechanical analysis
- Explain the importance of biomechanical analysis
- Explain Joint structure and Function in terms of
 - 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.
- Discuss 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

Unit 2 Biomechanics of spine:

1. Discuss the Biomechanics of Cervical spine, Lumbar Spine and Pelvic complex in terms of
 - a. Structure and function of cervical spine,
 - b. Factors responsible for stability of cervical spine
 - c. Movements of cervical spine.
 - d. Structure and function of lumbar spine,
 - e. Factors responsible for stability of lumbar spine
 - f. Movements of lumbar spine.

g. Structure and function of pelvic complex- Sacro-iliac Joint, Sacrum, symphysis pubic joint and lumbo sacral joint

- Analyse the movement of spine
- Identify the abnormal movements of Spine

Biomechanics of the Thorax and Chest wall -

Discuss Biomechanics of the Thorax and Chest wall in terms of

- a. General structure and function
 - b. Rib cage and the muscles associated with the rib cage
 - c. Ventilator 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
- Identify the abnormal movements of thoracic cage
 - Discuss the mechanics of abnormal thoracic movement
 - Describe the Temporomandibular Joint in terms of . General features, structure, function and dysfunction
 - Discuss the mechanics of abnormal TMJ movements

Unit 2: Biomechanics of the upper extremity joints -

- Explain the shoulder complex in terms of Structure and components of the shoulder complex and their integrated function
- Identify the normal and abnormal movements of shoulder
- Discuss static and dynamic stability of Shoulder
- Describe the common abnormalities of shoulder movement
- Describe elbow complex in terms of Structure and function of the elbow joint – humero ulnar and humero radial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
- Identify the normal and abnormal movements of elbow joint
- Describe the common abnormalities of elbow movement
- Discuss wrist and hand complex in terms of : Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand.
- Identify the normal and abnormal movements of wrist complex

- Describe the common abnormalities of wrist complex

Unit 3: Biomechanics of the lower extremity joints

- Explain The hip complex in terms of : structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur
- Identify the normal and abnormal movements of Hip joint
- Discuss stability of Hip
- Describe the common abnormalities of hip movement
- Explain knee complex in terms of structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
- Identify the normal and abnormal movements of knee joint
- Discuss stability of knee complex
- Describe the common abnormalities of knee movement
- Explain ankle and foot complex in terms of structure and function of the ankle joint, subtalar joint, talo calcaneo navicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints,
- Discuss the structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

SECTION-B

Unit 4: Posture

- Define Posture
- Explain normal posture
- Discuss the factors affecting posture
- Explain the causes for abnormal posture
- Discuss kinetics and kinematics of posture
- Identify postural abnormalities
- Discuss the role of posture in preventing musculoskeletal disorders.

- Describe ergonomics
- Discuss the effects of age, pregnancy, occupation and recreation on posture

Unit 5 : Gait

- Explain the normal gait cycle
- Discuss the kinetics and kinematics of gait
- Discuss the determinants of gait
- Identify gait abnormalities
- Discuss the energy recruitment of normal and abnormal gait
- Explain the kinetic and kinematic analysis of stair climbing
- Identify the effects of muscle weakness on gait

Describe 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.

Recommended Text Books

1. Cynthia C, Norkin D, Pamela K. Joint structure and function. A comprehensive analysis.
2. Houglum PA, Bertoti DB. Brunnstrom's clinical kinesiology. FA Davis; 2011.

Recommended Reference Books

1. Steindler A. Kinesiology of the human body under normal and pathological conditions. Spring-field, IL. Charles C Thomas.

2. Neumann DA. Kinesiology of the musculoskeletal system-e-book: foundations for rehabilitation. Elsevier Health Sciences;
3. Oatis CA. Kinesiology: the mechanics and pathomechanics of human movement. Lippincott Williams & Wilkins;2009.
4. Hamill J, Knutzen KM. Biomechanical basis of human movement. Lippincott Williams & Wilkins; 2006 Oct1.
5. Robert shawe P. Kapandji AI.: The Physiology of the Joints, Volume 3: The Spinal Column, Pelvic Girdle and Head. Journal of the Australian Traditional-Medicine Society. 2009 Sep1;15(3):178-9.
6. Margareta Nordin: Basic Biomechanics of Musculoskeletal System, 4thEdition

COURSE CODE : 208

Course Title : Yoga & Systems of Medicine

Subject Description and instruction to teacher

Yoga and AYUSH is the ancient wisdom of our country that plays a vital role in keeping a person healthy. The purpose of this introductory course on yoga and Ayush is to introduce the conceptual foundation of yoga and Ayush System and its role in maintaining the health of an individuals . The emphasis will be on learning the correct methods of performing basic *asanas* , and *pranayaam* and inculcate practice yoga in daily life routine

Course Outcomes:

After completion of this course the student shall be able to

1. understand the conceptual aspect of yoga and other Systems of Medicine.
2. appreciate the role of yoga in maintaining personal and societal health
3. perform basic asnas and pranayam
4. have an understanding of kriyas

SECTION -A

THEORY

1. Foundations of Yoga
 2. Introduction to Yoga and its philosophy
 3. Brief history, development of Yoga
 4. Streams & types of Yoga

2. Yoga and Health
 1. Concept of body in yoga – Panchakosha theory
 2. Concept of Health and Disease in yoga
 3. Stress management through yoga
 4. Disease prevention and promotion of positive health through yoga

3. Physiological effects of Yoga practices

1. Physiological effects of Shat kriyas
2. Physiological effects of Asanas
3. Physiological effects of Pranayamas
4. Physiological effects of Relaxation techniques and Meditation

PRACTICAL

- List of Practical / Demonstrations (30 hours)

1. Sukshma Vyayama/Sithilikarna Vyayama and Surya Namaskar: (3 hours)
2. Loosening exercises of each part of the body particularly of the joints
3. 12 step Surya namaskar
2. Yogic kriyas [Observation/ demonstration only] (3 hours)
 1. Neti (Jala Neti, Sutra Neti)
 2. Dhauti (Vamana Dhauti, Vastra Dhauti)

3. Trataka

4. Shankaprashtana (Laghu & Deergha)

3. Yogasanas

1. Standing postures (4 hours)

2. Tadasana (Upward stretch posture)

3. Ardha Chakrasana (Half wheel posture)

4. Ardha Katicakrasana (Half lumber wheel posture)

5. Utkatasana (Chair posture)

6. Pada Hastasana (Hand to toes posture)

7. Trikonasana (Triangle posture)

8. Parshva Konasana (Side angle posture)

9. Garudasana (Eagle posture)

10. Vrikshasana (Tree posture)

2. Prone positions (4 hours)

1. Makarasana (Crocodile posture)

2. Bhujangasana (Cobra posture)

3. Salabhasana (Locust posture)

4. Dhanurasana (Bow posture)

5. Naukasana (Boat posture)

6. Marjalarasana (Cat posture)

3. Supine postures (4 hours)

1. Ardha halasana/ Uttana Padasana

2. Sarvangasana (All limb posture)

3. Pawana muktasana (Wind releasing posture)

4. Matsyasana (Fish posture)

5. Halasana (Plough posture)

6. Chakrasana (Wheel posture)

7. Setu Bandhasana (Bridge posture)

8. Shavasana (Corpse posture)

4. Sitting postures

1. Parvatasana (Mountain posture)

2. Bhadrasana (Gracious posture)

3. Vajrasana (Adamantine posture)

4. Paschimottanasana (Back stretching posture)

5. Janushirasana (Head to knee posture)

6. Simhasana (Lion posture)

7. Gomukhasana (Cow head posture)

8. Ushtrasana (Camel posture)

9. Ardha Matsyendrasana (Half matsyendra spine twist posture)

10. Vakrasana (Spinal twist posture)

11. Kurmasana (Turtle posture)

12. Shashankasana (Rabbit posture)

13. Mandukasana (Frog Posture)

5. Meditative postures and Meditation techniques (2 hours)

1. Siddhasana (Accomplished pose)

2. Padmasana (Lotus posture)

3. Samasana

4. Swastikasana (Auspicious posture)

4. Pranayamas

1. The practice of correct breathing and Yogic deep breathing

2. Kapalabhati

3. Bhastrika²⁵⁹

4. Sitali
5. Sitkari
6. Sadanta
7. Ujjayi
8. Surya Bhedana
9. Chandra Bhedana
10. Anuloma-Viloma/Nadishodana
11. Bhramari

5. Relaxation Techniques

1. Shavasana
2. Yoga Nidra

SECTION -B

Other Systems of Medicine

- 1.Introduction to AYUSH system of medicine
- 2.Introduction to Ayurveda.[Philosophy and Principals,Methods and Brief Treatment Techniques].
- 3 Naturopathy [Philosophy and Principals,Methods and Brief Treatment Techniques]
- 4.Unani [Philosophy and Principals,Methods and Brief Treatment Techniques].
- 5.Siddha [Philosophy and Principals,Methods and Brief Treatment Techniques].
- 6 Homeopathy [Philosophy and Principals,Methods and Brief Treatment Techniques].
7. Need for integration of various system of medicine

Recommended text books

- 1.Lights on yoga by BKS Iyengar
- 2.Lights on pranayam by BKS Iyengar
3. Anatomy and Physiology of Yogic Practices - M.M Ghore, Kaivalyadhama, Lonavala, Pune.
4. A Systematic course in the ancient tantric techniques of yoga and kriya - Bihar School of Yoga, Munger.
5. Yoga for different ailments - series published by SVYASA, Bangalore and Bihar Yoga Bharati.
6. Yoga for common ailments : Robin Monro, Nagarathna & Nagendra - Guia Publication, U.K.
7. Yoga therapy : by Swami Kunalayanand, Kaivalaya dhama, Lonavala.
8. Yogic therapy : Swami Shivananda, Umachal Yoga Ashram, Kamakhya, Assam.

Clinical observation

Students will be posted in rotation in the physiotherapy OPDs and various wards of hospitals attached with the college. The students will observe the process of providing physiotherapy care for the patients. They may assist the clinical staff as well in executing non clinical aspects of service delivery. Each student shall maintain a case portfolio / diary to record the various activities performed during clinical posting. This diary should be presented before the final exam and the grade should be awarded by the college.

THIRD YEAR B.P.T

Course Code :301

Course Title : General Medicine

Subject Description and instruction to teacher

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 after lectures and discussion and clinical demonstrations the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions and appreciate the role of physiotherapy in overall management of patient

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Communicable and infectious diseases Cardio-vascular system (Acquired, congenital and infective) Nervous system Acquired, congenital, infective and traumatic) Respiratory system (Infective, acquired, acute and chronic) Gastro-intestinal system Genito- Urinary system Integumentary system
2. Acquire skill of history taking and clinical examination of respiratory, cardio-vascular system as a part of clinical teaching
3. Demonstrate competencies in identifying common clinical signs of various disorders
4. Interpret auscultation findings related to respiratory and cardiac system
5. Interpret Chest X-ray, Blood gas analysis, Pulmonary Function Tests& Haematological studies relevant to cardiovascular, respiratory and general medical conditions
6. Acquire knowledge for drugs used in each condition to understand its effect influence on Physiotherapy management
7. Appreciate the role of different specialist in diagnosing and managing the disorders.

General Medicine

1. Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of
 - Communicable and infectious diseases
 - Cardio-vascular system (Acquired, congenital and infective)

- Nervous system (Acquired, congenital, infective and traumatic)

- Respiratory system (Infective, acquired, acute and chronic)

- Gastro-intestinal system

- Genito- Urinary system

- Integumentary system

2.Demonstrate competencies in identifying common clinical signs of various disorders

3.Demonstrate knowledge in common diagnostic procedures used (Blood investigations, Radiologic procedures)

4.Appreciate the role of different specialist in diagnosing and managing the disorders.

- Lecture
- Tutorial
- Case discussion
- Clinical Observation
- MCQs
- Structured Essays
- Viva-voce

THEORY

SECTION -A

Unit 1: Topic: Infections

- Classify communicable diseases
- Discuss the importance of prevention of communicable diseases
- Discuss the physiological changes caused due to infection.
- Describe the methods of spreading the infections
- Discuss different types vaccination used in Infections
- Discuss the importance of vaccination
- Discuss the clinical features, Diagnosis, Complications and medical management of
 - •food poisoning and gastroenteritis
 - Sexually transmitted diseases
 - Tuberculosis
 - Leprosy

- Rheumatic fever
- Tetanus, Typhoid, Diphtheria
- Pneumonia
- Influenza Herpes – simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, HIV infections and AIDS.

Unit 2: Metabolic and Deficiency Diseases

Discuss etiology, clinical features, diagnosis, complications and treatment

- Diabetes
- Anemia
- Vitamin & Mineral Deficiency diseases
- diseases of the endocrine glands

Unit 3: Diseases of Respiratory System:

Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions:

- Asthma
- Bronchitis

- Tuberculosis
- Massive collapse of lungs
- Bronchiectasis
- Bronchial Pneumonia
- lung abscess
- Emphysema
- Pleural effusion
- Pneumothorax & vocal cords
- chronic infection of larynx and trachea
- Abnormalities of trachea
- infarct of lungs
- chronic obstructive pulmonary disease
- chest wall deformities

Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions

- Atherosclerosis, Thrombosis, Embolism, Hemorrhage, various diseases of arteries,
- Vascular diseases
- ischemic heart disease
- rheumatic heart disease
- congenital heart disease
- cardiac arrest
- Hypertension

SECTION -B

Unit 5: Nutritional Disorders

- Describe in details about Nutritional and Energy requirements
- Explain detail clinical Features and treatment of Deficiency diseases (Protein, Vitamin)

- Discuss Management of Obesity – diet, exercise and medications

Unit 6: Diseases of Digestive and renal Systems

Discuss etiology, clinical features, diagnosis, complications and treatment of the following:

- Reflux Esophagitis, Achalasia Cardia, Carcinoma of Esophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract
- Viral Hepatitis, Wilson’s disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholecystitis.
- Renal Failure, Nephrotic Syndrome, Nephritis, Urinary tract infections, Urinary calculi.

Unit 7: Diseases of Skin

Discuss the Causes, clinical features and management of the following skin conditions

- Acne, Boil, Carbuncles, Impetigo, Herpes, Urticaria, Psoriasis, Warts, Corn, Psoriasis, Fungal infections, Leprosy, Dermatitis, Eczema, Venereal diseases.

Unit 8: Pediatrics

- Enumerate the problems and management LOW Birth Weight Babies
- Describe the common congenital Abnormalities with causes and its management.

- Explain the causes, types, complications, clinical manifestations, and medical management of cerebral palsy
- Explain the causes, types, complications, clinical manifestations, and medical management of spinal malformations
- Describe the causes, types, complications, clinical manifestations, and medical management of epilepsies
- Discuss the causes, clinical manifestations, investigation procedures and medical management of autism spectrum disorders.
- Discuss the causes, clinical manifestations, investigation procedures and management of hydrocephalus (Including surgical)

Unit 9: Geriatrics

- Discuss the epidemiology, pathogenesis, clinical evolution, presentation and course of common diseases in the elderly
- Discuss the causes, signs and symptoms degenerative disorders of the aging population (Neurological and musculoskeletal)

Recommended text books

1. Davidson's principles and Practices of Medicine – Edward – Churchill Livingstone.
2. Hutchinson's Clinical Methods – Swash – Bailliere Tindall.

3. A Short Text book of Medicine – Krishna Rao – Jaypee Brothers.
4. A Short Text book of Psychiatry – Ahuja Niraj – Jaypee Brothers.
5. Shah SN: API text book of Medicine. Vol I & II, 8th Ed, The Association of Physicians of India, Mumbai, 2008.
6. Golwalla SA, Golwalla AF: Medicine for students. 21st Ed, National book depot, Mumbai, 2005.
7. Das PC: Textbook of medicine. 4th Ed, Current books international, Kolkata, 2000.
8. Mehta PJ, Joshi SR, Mehta NP: Practical Medicine. 17th Ed, National Book Depot, New Delhi, 2005.

Recommended reference books

1. Fauci, Braunwald, Kasper, Longo, Jameson, Loscalzo: Harrison's principles of internal medicine. Vol I & II, 17th Ed, McGraw Hill, New York, 2008.
2. McPhee, Papadakis, Tierney: Current medical diagnosis and treatment. 46th Ed, McGraw Hill, New York, 2007.
3. Ogilvie & Evans: Chamberlain's symptoms and signs in clinical medicine – An introduction to medical diagnosis. 12th Ed, Butterworth Heinmann, oxford,
4. Douglas, Nicol & Robertson: Macleod's clinical examination. 11th Ed, Elsevier – Churchill Livingstone, Edinburgh, 2005

Course Code: 302

Course Title : General Surgery

Subject Description and instruction to teacher

-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 lectures and discussion and clinical demonstrations the student will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions and appreciate the role of physiotherapy in overall management of patient undergoing these surgical procedures

Course Outcomes:

Course outcome

General Surgery

1. Discuss the principles of general surgery and its implications to physiotherapy practice.(KH)
2. Explain the pathophysiology of wound healing including the factors affecting healing. (KH)
3. Discuss the effects of general anesthesia on various system and postoperative complications. (KH)
4. Describe the indications, procedures and complications and their implications in physiotherapy clinical decision making for common surgeries (K)

5. Discuss the common procedures used in plastic surgery and skin grafting.(KH)
6. Apply the basic surgical knowledge in physiotherapy clinical decision making. (KH)
 - Lecture
 - Tutorial
 - Case discussion
 - MCQs
 - Essay
 - Viva-voce

After completion of this course the student shall be able to

1. Discuss the principles of general surgery and its implications to physiotherapy practice
2. Explain the pathophysiology of wound healing including the factors affecting healing.
3. Discuss the effects of general anesthesia on various system and postoperative complications.
4. Describe the indications, procedures and complications and their implications in physiotherapy clinical decision making for common surgeries of Abdomen, Thorax, Nervous system, Pelvis and Vascular system

5. Apply the basic surgical knowledge in physiotherapy clinical decision making.
6. Interpret pathological / biochemical studies pertaining to surgical pre and post op conditions
7. Acquire the skill of clinical examination of pelvic floor
8. Acquire the skill of clinical examination of pregnant woman
9. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post – natal stage and menopause. stage and various aspects of urogenital dysfunction and their management in brief

SECTION -A

Unit 1: Introduction to General Surgery

- Discuss the principles of surgeries
- Explain the process of wound healing
- Discuss the surgical management of non-healing wounds
- Explain the principles of incision and suturing
- Discuss the types of anesthesia

- Explain the complications of general anesthesia on various systems
- Discuss the Principles of Post-operative management

Unit 2: Abdominal surgeries

- Explain the common abdominal incisions
- Discuss the common abdominal and pelvic organ surgical procedures and its physiotherapy implications (Hernioraphy, Colostomy, Ileostomy, Hysterectomy, Prostatectomy, cystectomy, Appendectomy and Cholecystectomy)

SECTION -B

Unit 3: Thoracic surgeries

- Explain the common thoracic incisions
- Discuss the common thoracic organ surgical procedures and its physiotherapy implications (CABG, Cardiac transplantation, Valve surgeries, Thoracotomy, Pleural surgeries, Lobectomy, Lung Volume reduction surgeries, Lung transplantation)

Unit 4: Burns and Plastic Surgery

- Explain the types of burns
- Explain the assessment procedures followed in standard burn care unit

- Discuss the medical and surgical management of Burns
- Discuss the common procedures used in plastic surgery and skin grafting
- Discuss the role of physiotherapy following skin grafts

Unit 5: Soft tissue surgeries

- Discuss the principles of tendon transfer surgeries
- Discuss the common tendon transfer surgery procedures in terms of indications, prognosis, postoperative care and physiotherapy role.

Practical/ clinical

Long case/ short case/ viva voce : focusing on history taking clinical examination interpretation of bedside charts, OSPE for equipments

Recommended text Books

1. S. Das: A concise textbook of surgery. 3rd Ed, Dr. S.Das, Calcutta, 2001.
2. S. Das: A manual on clinical surgery. 6th Ed, Dr. S. Das, Calcutta, 2004.
3. . Dutta DC: Text book of obstetrics / Textbook of gynecology. 5th / 6th Ed, New central book agency (P) ltd, Kolkata, 2003/2004.

4. Basak KS: Essentials of ophthalmology. 3rd Ed, Current books international, Kolkata, 2004.
5. Bhargava KB, Bhargava SK & Shah TM: A short textbook of E.N.T diseases. 7th Ed, Usha publications, Mumbai, 2005

Recommended reference books

1. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery. 24th Ed, Arnold, London, 2004.
2. Mowschenson PM: Aids to undergraduate surgery. 3rd Ed, Churchill Livingstone, Edinburgh,
3. Farquharson M & Moran B: Farquharson's textbook of operative general surgery. 9th Ed, Hodder Arnold, London, 2005.
4. Lumley JSP: Hamilton Bailey's demonstrations of physical signs in clinical surgery. Butterworth Heinman, Oxford,
5. Doherty MG: Current surgical diagnosis and treatment. 12th Ed, Lange medical books, New York, 2006.

COURSE CODE BPT 303

Course Title: Orthopedics

Subject Description and instruction to teacher

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.

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures, conservative and surgical management of patients with disorders of (including trauma) Bones Joints Muscles Soft tissues
2. Demonstrate competencies in identifying common clinical signs of various musculoskeletal disorders
3. Demonstrate abilities in performing special tests to differentially diagnosing soft tissue injuries.
4. Demonstrate abilities to interpret radiological finding related to physiotherapy practice.
5. Appreciate the role of different specialist in diagnosing and managing musculoskeletal disorders

SECTION -A

THEORY

Unit 1

1. Introduction

- Introduction to orthopedics.
- Clinical examination in an orthopedic patient.
- Common investigative procedures.
- Radiological and Imaging techniques in Orthopedics.
- Inflammation and repair, Soft tissue healing.

2. Traumatology

- Fracture: definition, types, signs and symptoms.
- Fracture healing.
- Complications of fractures.
- Conservative and surgical approaches.

- Principles of management – reduction (open/closed, immobilization etc.).

- Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).

3. Fractures and Dislocations of Upper Limb

•Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:

- Fractures of clavicle and scapula.

- Fractures of greater tuberosity and neck of humerus.

- Fracture shaft of humerus.

- Supracondylar fracture of humerus.

- Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.

- Side swipe injury of elbow.

- Both bone fractures of ulna and radius.

- Fracture of forearm – monteggia, galaezzi fracture –dislocation.

- Chauffer's fracture.
- Colle's fracture.
- Smith's fracture.
- Scaphoid fracture.
- Fracture of the metacarpals.
- Bennett's fracture.
- Fracture of the phalanges. (Proximal and middle.)

4. Dislocations of Upper Limb –

- Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc.
- Recurrent dislocation of shoulder.
- Posterior dislocation of shoulder – mechanism of injury, clinical features and management.

- Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

5. Hand Injuries - mechanism of injury, clinical features, and management of the following –

- Crush injuries.
- Flexor and extensor injuries.
- Burn injuries of hand

UNIT 2

6. Fracture of Spine

•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).

- Clay shoveller's fracture.
- Hangman's fracture.
- Fracture odontoid.
- Fracture of atlas.

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

8. Fracture of coccyx.
9. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.
10. Fractures and Dislocations of Lower Limb

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

- Fracture of pelvis.
- Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
- Fractures of trochanters.
- Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.
- Supracondylar fracture of femur.
- Fractures of the condyles of femur.
- Fracture patella.

- Fractures of tibial condyles.
- Both bones fracture of tibia and fibula.
- Dupuytren's fracture
- Maisonneuve's fracture.
- Pott's fracture – mechanism of injury, management.
- Bimalleolar fracture
- Trimalleolar fracture
- Fracture calcaneum – mechanism of injury, complications and management.
- Fracture of talus.
- Fracture of metatarsals—stress fractures jone's fracture.
- Fracture of phalanges.

11. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.

- Anterior dislocation of hip.

- Posterior dislocation of hip.

- Central dislocation of hip.

- Dislocation of patella.

- Recurrent dislocation of patella.

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

13. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:

- Meniscal injuries of knee.

- Cruciate injuries of knee.

- Medial and lateral collateral injuries of knee.

- Lateral ligament of ankle.

- Wrist sprains.

- Strains- quadriceps, hamstrings, calf, biceps, triceps etc.

- Contusions- quadriceps, gluteal, calf, deltoid etc.

- Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

SECTION -B

UNIT 3

14. Amputations - Definition, levels of amputation of both lower and upper limbs, indications, complications.
15. Traumatic Spinal Cord Injuries - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.
16. Deformities - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

A. Congenital Deformities –

- CTEV.

- CDH.

- Torticollis.

- Scoliosis.

- Flat foot.

- Vertical talus.

- Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita (amyoplasia congenita).

- Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfecta(fragile ossium).

- Cervical rib.

B. Acquired Deformities –

- Acquired Torticollis.

- Scoliosis.

- Kyphosis.

- Lordosis.

- Genu varum.

- Genu valgum.

- Genu recurvatum

- Coxa vara.

- Pes cavus.

- Hallux rigidus.

- Hallux valgus.

- Hammer toe.

- Metatarsalgia.

17. Disease of Bones and Joints: Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:

- Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.

- Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilitic infection of joints.

- Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Giant cell tumor. Multiple myeloma. Metastatic tumors.

- Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.

- Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.

18. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:

- Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints.

•Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

UNIT 4

19. Syndromes: Causes, Clinical features, complications, management- conservative and surgical of the following:

•Cervico brachial syndrome. Thoracic outlet syndrome. Vertebro- basilar syndrome. Scalene syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome.

20. Neuromuscular Disorders: Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:

•Cerebral palsy.

•Poliomyelitis.

•Spinal Dysraphism.

•Leprosy.

21. Cervical and Lumbar Pathology: Causes, clinical feature, patho-physiology, investigations, management-Medical and surgical for the following:

•Prolapsed intervertebral disc (PID),

- Spinal Canal Stenosis.
- Spondylosis (cervical and lumbar)
- Spondylolysis.
- Spondylolisthesis.
- Lumbago/ Lumbosacral strain.
- Sacralisation.
- Lumbarisation.
- Coccydynia.
- Hemivertebra.

22. Orthopedic Surgeries: Indications, Classification, Types, Principles of management of the following Surgeries:

- Arthrodesis.
- Arthroplasty (partial and total replacement).
- Osteotomy,

- External fixators.
- Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc ,
- Limb re attachments.

23. Regional Conditions: Definition, Clinical features and management of the following regional conditions

- Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatu Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.
- Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis.
- Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
- Pelvis and Hip: IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.
- Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
- Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneal Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma.

Practical / Clinical

Long /short case examination of patient focusing on history taking examination observation , palpation , special tests , identification of abnormalities in radiograph diagnosis differential diagnosis
OSPE on equipments

Recommended Text Books

- Outline of Fracture-Adams
- Outline of Orthopaedics-Adams
- Orthopaedics and Traumatology-Natrajan
- Apley'sOrthopaedics
- Textbook of orthopaedics- Maheshwari

Recommended Reference Books

- Tureks Orthopaedics.
- Cambells Operative Orthopaedics.

COURSE CODE: B.P.T -304

Course Title : Physiotherapy in General Medical and Surgical Conditions

Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using physiotherapy techniques for the management of common medical and surgical conditions. The course 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, and to provide appropriate interventions to the patient. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged

Course Outcomes:

After completion of this course the student shall be able to

1. Demonstrate competencies in assessing and identifying impairments, activity limitations and participatory restrictions caused by Acute and chronic infections Integumentary diseases Genito-Urinary diseases Gastro-intestinal diseases
2. Demonstrate competencies in planning and implementing evidence based physiotherapy protocols to manage impairments, activity limitations and participatory restrictions caused by Acute and chronic infections Integumentary diseases Genito-Urinary diseases Gastro-intestinal diseases
- 3 Demonstrate competencies in assessing and identifying impairments, activity limitations and participatory restrictions due to common surgical procedures of Abdomen Thorax Pelvis Tendon transfer Plastic and reconstructive Organ transfer
4. Demonstrate competencies in planning and implementing evidence based physiotherapy protocols to manage impairments, activity limitations and participatory restriction due to common surgical procedures of Abdomen Thorax Pelvis Tendon transfer Plastic and reconstructive Organ transfer
- 5 Select and use appropriate outcome measures in postoperative care
- 6 Demonstrate competencies in documenting physiotherapy assessment and management protocol in managing medical and surgical clients

SECTION -A

THEORY

Unit 1

1. oedema-Traumatic, Obstructive, Paralytic, oedema due to poor muscle and laxity of fascia Lymphedema
2. Role of Physiotherapy in wounds and local infections Care of ulcers and wounds - Care of surgical scars-U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-granulated Scars Keloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues.
3. Physiotherapy in skin conditions 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 Hyperhidrosis. Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot;

Unit 2

4. Principles of Pre and post operative Physiotherapy in abdominal surgeries common Complication , Abdominal incisions assessment ,
5. Physiotherapy in pre and post-operative stages of

•Operations on upper G.I.T.- oesophagus, stomach, duodenum

•Operations on large and small intestine – Appendisectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.

6. Physiotherapy in burns, skin grafts, and reconstructive surgeries

SECTION -B

Unit 3

7. Vestibular Rehabilitation: Role of vestibular system in postural control Assessment of Balance and vestibular ocular reflex Benign Paroxysmal Positional Vertigo, Unilateral Vestibular Loss, Bilateral Vestibular Disorder– Assessment and management of Posterior Canal, Anterior Canal, Horizontal Canals Treatment theory, goals of management and progression Exercise Prescription in Vertigo

8. Physiotherapy in obstetrics & gynecology :Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy) Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy) Complication of pregnancy Pregnancy Labour training Antenatal and post natal training Abdominal and pelvic floor muscles exercise Prolapse Uterus Pelvic Inflammatory Conditions Stress Incontinence, Yoga in Obstetric and Gynecological conditions

9. Physiotherapy in Oncology and palliative care Introduction and common symptoms of cancer Breast Cancer Head and neck cancer Lung Cancer Oral cavity Bone Cancer Pre and post-surgical evaluation Lymphedema managements Palliative care Common Physiotherapy approaches

Unit 4

10. Geriatric Physiotherapy I: Normal Ageing – Definition, the anatomical, physiological and cognitive changes related to aging. Epidemiology and socio-economic impact of aging The examination and assessment of a geriatric patient Diet and nutritional requirement of the elderly, Falls in the elderly Dementia – types and principles of management

11. Physiotherapy in metabolic disorders : Role of Physiotherapy in Hypertension Role of Physiotherapy in Diabetes

12. Ear, Nose and Throat conditions: Otitis Media, Sinusitis mastoidectomy, chronic rhinitis, laryngectomy, pharyngeal – laryngectomy, facial palsy. Physiotherapy in dentistry – TMJ rehabilitation

PRACTICAL/ clinical –

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 and treatment techniques on student models/ simulation .
3. Identification of impairment activity limitation and participation restriction and Planning and execution of management protocol for various medical and surgical conditions with respect to

- Active exercise regimen

- RESPIRATORY techniques

- Passive mobilization and stretching procedures

- Selection of electrotherapeutic modalities

- Patient and caregiver education and training

- Functional training programme

- Bladder bowel training

- Integumentary care

4. Prescription and training of suitable aids appliances and Orthotic devices

5. Ergonomic advice

Recommended text books

1. Physiotherapy in Gynecological & Obstetrical conditions–Mantle

2. Text of Physiotherapy for obstetrics and Gynecology – G.B. Madhuri&Pruthvish
3. Physical Rehabilitation-Susan B O’Sullivan, Thomas. J.Schmitz
4. Multani and Verma – Principles of Geriatric Physiotherapy
5. Tidys Textbooks of Physiotherapy. Elsevier
6. Cash Textbook of Physiotherapy in Medical and Surgical Conditions.
7. Physical Rehabilitation, Assessment and management; Susan Sullivan
8. Physiothempy in Obstretrics and Gynaecology, Polden

Recommended reference books

1. Women’s Health – Sapsford
2. Geriatric Physical therapy- Andrew A.Guccione

COURSE CODE :B.P.T-305

Course Title : Physiotherapy in Orthopedic Conditions

Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using physiotherapy techniques for the management of common medical and surgical conditions affecting musculoskeletal system. The course is designed to provide knowledge in assessing and planning physiotherapy interventions for various conditions affecting musculoskeletal system. 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, and to provide appropriate interventions to the patient. 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. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged.

Course Outcomes:

After completion of this course the student shall be able to

1. Demonstrate competencies in assessing and identifying physiotherapy related problems due to (including trauma, infections and rheumatic disorders) Bones Joints Muscles Soft tissues Post-surgical conditions
2. Demonstrate competencies in differentially diagnosing various musculoskeletal disorders
3. Demonstrate competencies in developing and implementing evidence based physiotherapy protocol in managing (including trauma, infections and rheumatic disorders) Bones Joints Muscles Soft tissues Post-surgical conditions (Joint replacement and reconstructive surgeries)
4. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with musculoskeletal disorders)
5. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format.
6. Demonstrate competencies in communicating effectively to the stakeholders including health care providers.

THEORY

SECTION -A

Unit 1

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.
2. Fractures - types, classification, signs and symptoms, complications. Fracture healing - factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.
3. Principles of various schools of thought in manual therapy. (Briefly Maitland and McKenzie)
4. Principles of Pre and post-operative PT assessment, goals, precautions and PT management of Orthopedic surgeries: 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, Syn-

ovectomy.

5. 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, Periarthritic shoulder.
6. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.

Unit 2

Conservative and/peri-operative PT management in

7. Traumatic conditions of upper limb shoulder arm elbow forearm wrist and hand upper limb fractures and dislocations. sprains Hand Injuries: Flexor tendon, Extensor tendon, Compartment Syndrome, Reflex sympathetic dystrophy :
8. Non traumatic conditions of upper limb conservative and post-operative PT management of Shoulder instabilities, TOS, RSD, Impingement syndrome -. AC joint injuries - Rotator cuff tears- Subacromial decompression Carpal tunnel syndrome – deformities
9. pre and peri operative PT management following upper limb surgeries : Total shoulder replacement Hemi replacement Repair of ruptured extensor tendons.. Total wrist arthroplasty Flexor and extensor tendon lacerations Excision of radial head -. Total elbow arthroplasty
10. Amputations of upper limb 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

SECTION -B

Unit 3

conservative and/peri-operative PT management. in

11. Traumatic conditions of lower limb : pelvis.hip knee ankle and foot fractures and dislocations
12. NonTraumatic conditions of lower limb hip knee ankle and foot Tendonitis and bursitis Plica syndrome, patellar dysfunction and Hoffa's syndrome
Deformities of lower limb : CTEV, CDHpes planus, pes cavuscoxa vara, genu varum, valgum and recurvatum
13. pre and peri operative PT management following lower limb surgeries - hemi and total hip replacement -. - Lateral retinacular release, chondroplasty
ACL and PCL reconstruction surgeries Management. Realignment of extensor mechanism Meniscectomy and meniscal repair TKR Patellectomy Ligamen-
tous tears
14. Amputations of lower limb Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with em-
phasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management

Unit 4

conservative and/peri-operative PT management in

15. traumatic conditions of spine : SPINAL FRACTURES cervical thoracic lumbar Spinal CORD INJURY Intervertebral disc prolapsed (PIVD)
sprain contusion
16. non traumatic condition of spine : Cervical and lumbar spinal disorders: spondylosis, spondylolisthesis, Stenosis Cervical spondylosis, Lumbar
spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc pro-
lapse, Coccydynia, Spina bifida occultaThoracic Outlet Syndrome TB SPINE , non-specific low back pain Ankylosis spondylitis Scoliosis, kyphosis,
Lordosis, sway back , torticollis

17. pre and peri operative PT management following spine surgeries

18. Concepts of mechanize school of spinal disorders , back school

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.

Student should be able to execute independently the following procedures on self / human model / patient

History taking : examination observation palpation tests, investigation, diagnosis, functional diagnosis [impairment , functional restriction, activity limitation] documentation

Planning and execution of management protocol for various conditions of upper limb, lower limb, and spine in various clinical settings with respect to

Active exercise regimen

Passive mobilization procedures

Selection of electrotherapeutic modalities

Patient education

Functional training programme

Orthotic and prosthetic checkout and training

Ergonomic advice

Recommended Text Books

1. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
2. Tidy's Physiotherapy, Ann Thomasons ,Varghese publishing House.
3. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
4. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.
5. Textbook of Orthopaedics and Rheumatology for Physiotherapists, Patricia A Downie.
6. Orthopedic Physical Assessment – David Magee
7. Clinical Orthopaedic Diagnosis – Surishwar Pandey
8. Orthopaedics for Physiotherapist – Jayant Joshi.
9. Therapeutic Exercise: Foundations and Techniques - Kolby & Carolyn Kisner

Recommended Reference Books

1. Apley's system of Orthopaedics and fractures -Louis Solomon, David J. Warwick Arnold Publishers, London
2. Turek's Orthopaedics: Principles and their Application , Weinstein SL and Buckwalter JA, Lippincott
3. Clinical Orthopaedic Rehabilitation, Brent Brotzman.
4. Peripheral Mobilisation – GD Maitlant, Butterworth
5. Vertebral Mobilisation – GD Maitland, Butterworth and Heinmann Publication.
6. Manual Therapy: Nags, Snags, MWMs, etc - 6th Edition Brian Mulligan
7. Neural tissue mobilization –Butler
8. Therapeutic Exercise: Moving Toward Function - Carrie M. Hall, Lori Thein Brody
9. Manual Mobilization of Extremity Joints-Kaltenborn
10. Clinical Orthopaedic rehabilitation- Broadsman

COURSE CODE: BPT-306

Course Title : Physical & Functional Diagnosis and Prescription

Subject Description and instruction to teacher

the aim of this course is to impart conceptual clarity on the process of identifying the problems of patient within the scope of physiotherapy practice and equip the students with skills to evaluate the patient afflicted with the disorders of musculoskeletal, neuromuscular, cardiovascular-pulmonary and integumentary systems using valid and reliable measures while taking into account the setting in which patients/clients receive services, The teaching method should follow DOAP [demonstrate observe assist perform] model and should ensure that before attempting to perform the tests on patients the student should demonstrate the ability to safely perform the test on healthy human model .

Course Outcomes:

After completion of this course the student shall be able to

1. Explain movement dysfunction and models used to evaluate function in ICICDH, ICF approach
2. Explain choice of appropriate tools/instruments of assessment in musculoskeletal, neurological and cardio-vascular and respiratory conditions
3. Demonstrate the skills for independent performance of various tests and procedures
4. Document evaluation finding of patient based on ICF model identifying structural impairments, functional impairments, participation, contextual factors, performance and capacity measurement

THEORY

SECTION -A

Unit 1

1. Introduction to International Classification of Function, Disability & Health (I.C.F.) as a basis Functional Diagnosis of impairment, activity limitation and participation restriction

Assessment of Musculoskeletal Dysfunction oft tissue flexibility, Joint mobility, Muscle strength & Endurance, Trick movement, Sensations, Limb length, Abnormal posture, Gait deviations due to musculoskeletal dysfunction Special Tests Cervical Spine: Foraminal compression, Distraction, Shoulder depression, vertebral artery, Dizziness tests Shoulder: Yergason's, Speed's, Drop- Arm, Supraspinatus, Impingement, Anterior & Posterior Apprehension, Allen's, Adson's test. Elbow: Cozen's, Miller's, Tinel's sign Forearm, Wrist & Hand: Phalen's, Bunnel-Littler, Froment's sign Lumbar Spine: Schober's, SLR, Prone, Knee Bending, Slump. Sacro Iliac joint: Faber- Patrick's, Gaenslen, Gillet, March's test Hip: Nelaton's line, Bryant's triangle, Thomas, Ober's, Tripod sign, Trendlenburg sign Knee: Tests for collateral & cruciate ligaments (valgus, varus, Lachman, Drawer's, McMurray's, Fluctuation, Patellar tap, Q- angle, Clarke's test Ankle & Foot: Anterior Drawer, Talar Tilt, Homan's & Moses tes

2. Assessment of pain Types of pain: Somatic, Somatic referred, Neurogenic, Visceral Subjective Assessment: Location, duration, progression, distribution, quality, diurnal variations, modifying factors, Severity, nature of pain, tissue irritability Objective Measurement & Documentation- Visual Analogue Scale (V.A.S), Numerical Rating Scale(N.R.S.), McGill's modified questionnaire(including Body Charts)

3. Basics in Manual Therapy with Clinical Reasoning: Assessment of Articular and extra-articular soft tissue status Contractile tissues, Non contractile tissues, Examination of joint integrity, Accessory movement, End feel Examination of musculoskeletal Dysfunction: Subjective examination, Objective examination, Special tests, Functional Diagnosis using ICF

4. Neurological Assessment and Movement Dysfunction i. Higher functions, Cranial nerves, Sensations , sensory organization & body image, Joint mobility, Tone, Reflexes-Superficial & Deep, Voluntary control, Muscle Strength, Co-ordination, Balance, Endurance, Trick movements, Limb Length, Posture deviations, Gait deviations due to neurological dysfunction, Functional Diagnosis using I.C.F.,

electro diagnosis- Faradic Galvanic Test, Strength Duration Curve-tests, Test for Sensory & Pain Threshold/Pain Tolerance

5. Electro-Myography a) Definition b) Instrumentation – Basic components like C.R.O., Filter, Amplifier & Preamplifier and Types of Electrodes Normal & Abnormal E.M.G. pattern i. at rest ii. on minimal contraction iii. on maximal contraction c) Nerve Conduction Studies i. Principles & Technique ii. F wave H reflex), routine Biochemical investigations
6. SCALES: Berg Balance, Modified Ashworth, F.I.M., Barthel Index, G.C.S.,D.G.I., M.M.S.,S.T.R.E.A.M. & A.S.I.A.

SECTION -B

Unit 2

7. General principles of Human development & maturation i. Aspects a) Physical b) motor c) Sensory d) Cognitive & Perceptive e) Emotional f) Social ii. Factors influencing human development & growth: a) Biological b) Environmental inherited iii. Principles of maturation in general & anatomical directional pattern – a) Cephalo – caudal b) Proximo – distal c) Centro – lateral d) Mass to specific pattern e) Gross to fine motor development f) Reflex maturation tests iv. Development in specific fields - Oromotor development, sensory development, neurodevelopment of hand function
8. **Assessment of Cardio Vascular & Pulmonary Dysfunction** : cardiorespiratory Assessment and management techniques: Vital parameters, Chest expansion, Symmetry of chest movement, Breath Holding Test, Breath Sounds, Rate of Perceived Exertion (R.P.E.), 6minute walk test , Auscultation, Breathing exercises, postural drainage, thoracic expansion, rib mobilization, Respiratory PNF
9. Evaluation of Functional Capacity using sub maximal tests (Exercise Tolerance – Six Minutes Walk test)Theoretical bases of different protocols for maximal exercise testing (e.g.: Bruce Protocol, Modified Bruce Protocol, Balke) Interpretation of reports – A.B.G., P.F.T., P.E.F.R., E.C.G.- (Normal & Variations due to Ischemia & Infarction), X-ray Chest, Biochemical Reports Ankle Brachial Index Tests for Peripheral Arterial & Venous circulation, BMI, Waist – Hip Ratio, Skin fold Caliper, Girth measurements
10. Diagnostic Imaging :

1. Radiological studies in musculoskeletal, neurological, cardiovascular and respiratory conditions.
2. Basic principles of X-rays, instrumentation, observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions
3. Ultrasonography- Principles, instrumentation, observations in vascular disorders, gynecological conditions, recent advances in musculoskeletal ultrasonography
4. CT scan and MRI- Principles, instrumentation and observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions
5. Interventional Radiology

PRACTICAL

Student shall be able to perform the Demonstration of all the test procedures mentioned in the syllabus on self / human model and provide interpretation of x ray image .

Recommended Text Books

1. Orthopaedic Physical Examination–Magee
2. Clinical Electro Therapy – Nelson – Currier --- Appleton & Lange publication
3. Clinical Electromyography–Mishra
4. Physical Rehabilitation, Assessment and treatment - Susan BO's Sullivan
5. Neurological Examination –John Patten

6. Diagnostic and Interventional Radiology- Thomas J. Vogl, Wolfgang Reith, Ernst J. Rummeny.
7. Learning Radiology- William Herring.
8. Ruppel's Manual of Pulmonary Function Testing by Carl Mottram 10th Edition
9. Pulmonary Function Tests & Interpretation In Health & Diseases By P.S. Shankar 3rd Edition
10. World Health Organization 2001. The International Classification of Functioning, Disability and Health (ICF). Geneva: WHO. <http://www.who.int/classifications/icf/en/>

Recommended Reference Books

1. Maitland's book on Manual therapy,
2. Mobilisation of Extremities – Kaltenborn
3. Clinical Electromyography–Kimura
4. Orthopaedic Physical therapy–Donnatelli
5. NAGS, SNAGS and MWMS – Brian Mulligan
6. Physical Dysfunction – Trombly Scoot
7. Infant Motor Development-Jan Piek
8. Neuro-developmental Therapy–Janett Howle
9. Textbook of Radiology and Imaging- David Sutton

COURSE CODE BPT 307

Course Title : Research Methodology , Biostatistics and Evidence Based Practice

Subject Description and instruction to teacher

The objective of this course is to help the students understand the basic principles and methods of research used in health sciences so as to facilitate drawing inferences from the research findings and engage in evidence based practice. The focus of the teaching should be to enable the student to read the research literature and draw inference. The derivation of the statistical tests and the detailed manual calculation should be avoided , rather the emphasis should on making students aware about the uses and interpretation of the tests results . The research papers and thesis reports using various designs of research should be shown to the students and small group discussion should be organized to facilitate understanding of the literature. Students should be encouraged to produce dummy research proposal.

Research methodology, biostatistics and evidence-based practice

1. Discuss the need for research in physiotherapy practice
2. Explain the process of research.
3. Discuss the study designs with appropriate examples.
4. Discuss the methods of data collection in physiotherapy research.
5. Discuss the components statistical analysis.
6. Explain the process of Evidence based physiotherapy practice.

7. Demonstrate skills in literature search through primary and secondary database.

8. Demonstrate skills in critically appraising the evidence.

9. Discuss the importance of Evidence Based Practice.

- Lecture
- Tutorial
- Demonstration
- Small group discussion
- MCQs
- Assignment
- Seminar
- Presentations.

- Explain Introduction to Research methodology: which includes Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, ethics of research

- Describe in details about terms of Research problem, Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem , hypothesis , limitations , delimitations significance of the study

- Discuss meaning, need, features & basic principles of Research design.

- Discuss about Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions, Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design
- Discuss the aspects of Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, reliability, validity , sensitivity and specificity of a measurement tool Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.
- Enumerate the Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules
- Discuss the Processing & analysis of data: coding of data , types of data , quantitative analysis qualitative analysis
- Describe Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis)
- Explain the Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

SECTION -A

Introduction to Biostatistics

- Discuss the Introduction of biostatistics, 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.
- Explain introduction of the Tabulation of Data which includes Basic principles of tabulation and graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve. Pie chart
- Describe the 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.
- Discuss the Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skew ness, kurtosis.
- Discuss the Sampling techniques, sample size, calculation of sample size for survey, and experimental research designs, Sampling variation and tests of significance. type I and type II errors, Power
- Discuss the Testing of hypothesis: Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, parametric and non-parametric tests for difference , correlation and association

- Describe Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)
- Define EBP
- Discuss the importance of EBP in physiotherapy practice
- Describe the process of EBP
- Formulate clinical questions for evidence search using structured format (PICO,PICOT, SPDER, SPICE)
- Aetiology
- Prevention
- Intervention
- Diagnosis
- Discuss the importance of evidence search

- Discuss the levels of evidence
- Describe the process of literature search
- Identify primary and secondary database for literature search
- Demonstrate skills in searching through primary and secondary database
- Explain internal and external validity of evidence
- Discuss the process of systematic review
- Discuss metanalysis
- Appraise the evidence using appropriate critical appraisal tools (RCT, Systematic Reviews, Cohort studies)
- Discuss the importance of Outcome measures
- Identify appropriate outcome measures
- Discuss sensitivity, Specificity and Minimal Clinical Significance difference

- Discuss the importance of Clinical Practice Guidelines (CPGs)
- Search for CPGs through common database and search engines
- Appraise CPGs using appropriate tools
- Discuss the challenges and Barriers in implementing EBP

SECTION -B

THEORY

UNIT 1

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, ethics of research
2. Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem , hypothesis , limitations , delimitations significance of the study
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 Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions, Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design

5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, reliability, validity , sensitivity and specificity of a measurement tool Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.
6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
7. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).
8. Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

UNIT 2

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 tabulation and graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve. Pie chart
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 – skew ness, kurtosis.
5. Sampling techniques: sample size , calculation of sample size for survey , and experimental research designs, Sampling variation and tests of significance. type I and type II errors, Power

6. Testing of hypothesis: Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, parametric and non parametric tests for difference , correlation and association
7. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA).

UNIT 3

8. **Introduction to Evidence Based practice** Definition, background, importance, model of Evidence Based Physiotherapy, role of evidence based practitioner
9. Searching for the Evidence: Asking Questions, Identifying different sources of evidence, Electronic Bibliographic databases and World Wide Web, Conducting a literature search. Step by-step search for evidence
10. **Exploring different terminologies** Validity, reliability, Randomized Control Trial, Systemic Review, Meta-Analysis, Case Study, Diagnostic research study, Prognostic Research study, Intervention research study,
11. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system
12. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs

UNIT 4

13. Appraisal of the quality of the studies, result of the studies, technique of pull out the summary of the studies and communicate evidence about diagnostic test Diagnostic test and process in physiotherapy,
14. evidence about prognosis Concept of prognosis, research design relevant to prognostic studies, process of knowing the quality of study
15. evidence about outcome measure Elements of outcome measure, method of knowing validity and reliability, take out the outline from the studies
16. evidence about intervention Concept of various types of intervention in physiotherapy, Research design related to intervention studies, know the strength and weakness of the study
17. evidence about systemic reviews and other research design Overview of systematic reviews, Meta-analysis, The Cochrane collaboration stages and techniques involve in it, procedure to critically appraise it and extract the terminal results to make valid and relevant clinical decision, Introduction to case study and qualitative research, evaluating the robustness and fragility of the studies
18. Practice guidelines, algorithms, and clinical pathways: Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical pathways, Legal implications in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways

Recommended Text Book

1. Mahajan, B. K. (2002). *Methods in biostatistics*. Jaypee Brothers Publishers.
2. Hicks, C. *Research for physiotherapists: project design and analysis*. Churchill

3. Livingstone.
4. Practical Evidence-Based Physiotherapy By Robert Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead, Sir Iain Chalmers
5. Bajpai S.R. –Methods of Social Survey and Research, Kitab Ghar, Kanpur.
6. Mohsin S.M. – Research methods in Behavioral Sciences. Orient publications, New Delhi
7. Gupta S.P. – Statistical Methods. Sultan Chand and sons Publishers, New Delhi.

Recommended Reference Books

1. Evidence Based Physical Therapy By Linda Fethers, Julie Tilson
2. Guide to Evidence-Based Physical Therapy Practice By Dianne V .Jewell
3. Bailey N.T.J. – Statistical methods in Biology. The English University Press, London.
4. Colton – Statistics in medicine. Little Brown Company, Boston
5. Goulden C.H. – Methods of Statistical Analysis. Asia Publishing House, New Delhi.
6. Snedecor G.W. – Statistical Methods. Allied Pacific Pvt. Ltd., London

Clinical Education

Students will be posted in rotation in the various wards hospitals and physiotherapy OPDs attached with the college . 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. Critique Enquiry, Case Presentation, and Case Discussion shall be essential part of posting. Each student shall maintain a case portpofio / diary to record the various actities performed during clinical posting. This diary should be presented before the final exam and the grade should be awarded by the college.

4TH YEAR B.P.T

COURSE CODE : B.P.T -401

Course Title : NEUROLOGY INCLUDING PSYCHIATRY AND NEUROSURGERY

Subject Description

This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & psychiatry. 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 lectures and demonstration the student will be able to list the etiology, pathology, clinical features and treatment methods for various neurological and psychiatric conditions and appreciate the role of physiotherapy in overall management of patient.

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Central Nervous system Peripheral Nervous system and Neuro-Muscular system
2. Demonstrate competencies in identifying common clinical signs of various neurological disorders
3. Demonstrate knowledge in common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (Blood investigations, Radiologic procedures)
4. Appreciate the role of different specialist in diagnosing and managing the neurological and psychiatric disorders.

Theory

SECTION -A

Unit 1

1. Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping. Classification of neurological involvement depending on level of lesion.
2. 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.
3. 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.
4. Deafness, vertigo, and imbalance: Physiology, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.
5. Cerebro-vascular diseases: Define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts. Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke. Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.
6. Spinal cord disorders: Functions of tracts, definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcoidosis
7. Motor neuron diseases: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuroromyotonia and Post-irradiation lumbosacral polyradiculopathy.

Unit 2

4. Infections of brain and spinal cord: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Meningitis, Encephalitis, Poliomyelitis and Post-polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis
5. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.
6. Movement disorders: Definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athetosis, Tics, Myoclonus and Wilson's disease.
7. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications
8. Cerebellar and coordination disorders: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia telangiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.
9. Higher cortical, neuro psychological and neurobehavioral disorders: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical & surgical management of following disorders – Non-epileptic attacks of childhood, Epilepsy in childhood, Seizures, and Epilepsy syndromes in adult. Classification and clinical features of Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders. Neural basis of consciousness, causes & investigations of Coma, criteria for diagnosis of Brain death. Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Perceptual disorders and Speech disorders. alzaimers disease

10. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.
11. Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic counseling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.
12. Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.
13. Focal peripheral neuropathy: Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia. Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudental nerve palsy.
14. Paediatric neurology: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplasia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.
15. Toxic, metabolic and environmental disorders: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Plant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.
16. Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.
17. Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery – Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation

Unit 4

22. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. Modalities of psychiatric treatment, Psychiatric illness and physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -. Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health, theories of Stress – Illness.

23. Etio-pathogenesis, manifestations, and management of psychiatric illness

24. Drug dependence and alcoholism, Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue, Personality disorders

25. Child psychiatry - manifestations, and management of childhood disorders - **Mental retardation** attention deficit syndrome and behavioral disorders.

PRACTICAL / CLINICAL

LONG CASE SHORT CASE examination of neurological patients history taking , motor sensory reflex examination , interpretation of investigative findings , diagnosis differential diagnosis

Recommended Text Books

1. Davidson's Principles and practices of medicine - Edward - Churchill Livingstone.
- 2.API- Text book of Medicine, 5th edition
- 3.Medicine and Neurology by Golewala.

Recommended Reference Books

- 1.Brain's Diseases of the Nervous System - Nalton – ELBS.
- 2.Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
- 3.Principles of Neurology - Victor – McGraw Hill International edition.
- 4.Neurological Rehabilitation - Darcy Umphred.

SECTION -B

NEUROSURGERY

- A) Neurophysiology: Reviews in brief the neurophysiologic basis of tone and Disorders of tone and Posture, Bladder control, Muscle conduction, Movement and Pain.
- B) Clinical Features and Management: Briefly outline the clinical features and management of the following neurological disorders.
1. Congenital and Childhood disorders
 - a) Hydrocephalus.
 - b) Spinal Bifida.
 2. Trauma - Broad localization, first aid and management .
 3. Head Injury: : Etiology, pathophysiology, classification, clinical sign and symptoms, investigations, medical management, Surgical management and complications.
 4. Intra-cranial disorders – clinical features, complications & management of brain abscess, space occupying lesion, hydrocephalus, vascular malformation
 5. Brain tumors and Spinal tumors: , classification, clinical sign and symptoms, investigations, differential diagnosis, medical and surgical management.
 6. Intracranial tumours: Broad Classification, Signs and Symptoms.
 7. Vertebral column injuries – classification, clinical features, complications & management.
 8. Spinal Cord injury and Diseases of the Spinal Cord:
 - a. Craniovertebral junction anomalies.
 - b) Syringomyelia.
 - c) Cervical and lumbar disc disease
 - d) Tumours.
 - e) Spinal arachnoiditis.
 9. Peripheral Nerve Disorders:
 - a. Peripheral nerve injuries: Localization and Management
 - b. Entrapment Neuropathies.
 10. Pre-operative assessment, Indications and Contraindications for Neurosurgery.
 11. Introduction and brief description of indication and complications of following neurosurgeries: Craniotomies, cranioplasty, stereotactic surgery, deep brain stimulation, burr hole, shunting, laminectomy, hemilaminectomy, rhizotomy, microvascular decompression surgery, Endarterectomy, embolization, pituitary surgery, ablative surgery- Thalamotomy and pallidotomy, Neurolo implantation.
 12. Infections of brain and Spinal Cord: pathophysiology, classification, clinical sign and symptoms, investigations, differential diagnosis, medical management, surgical management and complications.
 13. Management of Pain, Electrical Stimulation of Brain and Spinal cord.

Practical

Clinical assessment of neurological function to be taught through bedside or demonstration in clinics, of the following:

- Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.

- Assessment of higher mental function such as Orientation, Memory, Attention, Speech and Language.
- 1. Assessment of Cranial nerves.
- 2. Assessment of Motor system.
- 3. Assessment of Sensory function, Touch, Pain and Position.
- 4. Assessment of Tone-Spasticity, Rigidity and Hypotonia.
- 5. Assessment of Cerebral function.
- 6. Assessment of Higher cortical function - Apraxia.
- 7. Assessment of Gait Abnormalities.

Students shall be posted for 10 hrs. in Neurosurgery units. They shall do clinical checking and ward work to acquaint themselves to neurological and surgical conditions.

PRACTICAL / CLINICAL

LONG CASE SHORT CASE examination of neurological patients history taking , motor sensory reflex examination , interpretation of investigative findings , diagnosis differential diagnosis

Books Recommended

Principles & Practice of Medicine –Davidson

API- Text book of Medicine, 5th edition
Medicine and Neurology by Golewala.

Recommended reference books

Brain's Diseases of the Nervous System - Nalton – ELBS.
 Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
 Principles of Neurology - Victor – McGraw Hill International edition.
 Davidson's Principles and practices of medicine - Edward - Churchill Livingstone.
 Medicine and Neurology by Golewala.
 Neurological Rehabilitation - Darcy Umphred.
 Baily's and Love Short Practice of Surgery.

Course Title : Physiotherapy In Neurological and Neurosurgical Conditions

Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using physiotherapy techniques for the management of common medical and surgical conditions affecting nervous system encountered in clinical physiotherapy practice. The course is designed to provide knowledge in assessing and planning physiotherapy interventions for various conditions affecting nervous system. 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. 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. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged.

Course Outcomes:

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Central Nervous system Peripheral Nervous system Neuro-Muscular system
2. Demonstrate competencies in identifying common clinical signs of various neurological disorders
3. Demonstrate knowledge in common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (Blood investigations, Radiologic procedures)
4. Appreciate the role of different specialist in diagnosing and managing the neurological and psychiatric disorders.

THEORY

SECTION-A

UNIT 1

1. Neurological Assessment: Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudzki sign, Tinel's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.
2. Neuro physiological Techniques – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstorm movement therapy, Motor relearning program, Contemporary task oriented approach, Muscle re-education approach and Constraint induced movement therapy.

UNIT 2

3. Evaluation and Management of Brain and Spinal Cord Disorders : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis
4. Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications,

short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.

UNIT 3

5. Paediatric Neurology: Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia
6. Assessment and management of Neurological gaits: Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short & Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Chorea form Gait, Diplegic Gait, and Myopathic Gait.

SECTION-B

UNIT 4

7. Evaluation and Management of Peripheral Nerve Injuries and Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy

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.

9. Applied Yoga in Neurological conditions.

PRACTICAL:

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

Bedside case presentations and case discussions

Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions

Student should be able to execute independently the following procedures on self / human model / patient

History taking : examination observation palpation tests, investigation, diagnosis, functional diagnosis [impairment , functional restriction, activity limitation] documentation

Planning and execution of management protocol for commonly encountered neurological condition in clinical practice of physiotherapy with respect to

Active exercise regimen

Inhibitory and facilitator techniques

Passive mobilization and stretching procedures

Selection of electrotherapeutic modalities

Patient and caregiver education and training

Functional training programme

Bladder bowel training

Integumentary care

Prescription and training of suitable aids appliances and Orthotic devices

Ergonomic advice

Recommended Text Books

1. Patricia A D. Cash's Text book for Physio Therapist in Neurological disorders. Jaypee bros;
2. Adler B. PNF in practice. Springer.
3. Hollis M. Practical Physical Therapy
4. O'Sullivan S. Physical Rehabilitation
5. Johnstone M. Therapy for stroke. Edinburgh: Churchill Livingstone;
6. Bromley I. Tetraplegia and Paraplegia: A guide for physiotherapists
7. Carr and shepherd neurological rehabilitation

Recommended Reference Books

1. Umphred D. Neurological rehabilitation. Saint Louis: Mosby/Elsevier;
2. Donaghy M. Brain's diseases of the nervous system. Oxford: Oxford University Press; 2009
3. Bobath B. Adult hemiplegia. Oxford (England): Heinemann Medical Books
4. Patricia M D. Right in the middle. Springer-Verlag.

COURSE CODE BPT 403

Course Title - CARDIO THORACIC DISEASES AND SURGERIES

Theory

SECTION -A

1. Brief idea of Anatomy and Physiology of Cardio- respiratory systems.
2. Outline Aetiopathogenesis of Cardio-respiratory disorders, Investigations, Diagnostic, Differential diagnosis and principles of management. 3. Cardio - Vascular System
 - i . Cardiac failure - Definition, Causes, Symptoms and Signs and Brief management of Cardiac failure.
 - ii. Rheumatic Fever - Definition, Brief description of Aetiology, Clinical features, Complication and Treatment.
 - iii. Congenital Heart Diseases: Classification and brief outline of diseases like ASD, VSD, PDA, Fallots's Tetralogy with complication.
 - iv. Ischemic Heart Disease - Aetiopathogenesis, Classification. Symptoms, Diagnosis and Medical and Surgical treatment. v. Hypertension - Definition, Classification, Symptomatology, Complications and Treatment,
 - vi. Infective Endocarditis - Brief aetiopathogenesis, clinical features, Diagnosis and Treatment.
 - vii. Brief description of Deep Vein Thrombosis and Pulmonary embolism.
 - viii. Vascular Disease: Atherosclerosis, Buerger's disease, Phlebitis etc. Respiratory System
(Respiratory diseases including diseases of chest wall) 1) Chronic Bronchitis and Emphysema, Definition.
Clinical features, and investigation, complication and treatment.
- 2) Bronchial asthma - Definition, Aetio pathogenesis, clinical features, Diagnosis and Treatment.
- 3) Pneumonia - Definition, Classification, clinical features, Complications and Treatment.
4. Tuberculosis - Aetiopathogenesis, clinical test of pulmonary tuberculosis, Diagnosis Complication & Treatment. 5. Lung abscess and Bronchiectasis - Definition, clinical features, Diagnosis and Treatment.
6. Chest wall deformities- Describe various deformities of chest wall, its effect and Pulmonary diseases associated with it.

7)Occupational Lung Diseases - Clinical features, Diagnosis and Treatment. 8)Respiratory failure - Classification, Causes and Treatment.

SECTION -B

Cardio thoracic surgeryTheory

i.Introduction-types of incision, pre and post operative assessment, management and complications of cardio thoracic surgery and their management.

ii. Cardiac Surgery-Outline indication, contra indication, site of incision, pre and post Operative management and complications of the following:

Pneumonectomy, segmentectomy, pleuro-pneumonectomy, Thoracoplasty, decortication, Tracheostomy.

iii. Outline clinical features and management of carcinoma of lung.

iv. Describe in detail the following procedure: management of endotracheal tubes, tracheal Suction, Weaning the patient from ventilator, Extubation and Post-extubation care.

v. Describe the principles of cardio-pulmonary Resuscitation, cardiac Massage, Artificial respiration, defibrillators and their use.

Valvotomy and Valve Replacement

Open heart surgery/ cardiac by pass surgery Surgery of pericardium

Heart transplantation

Pacemaker

Coronary angioplasty

Balloon angioplasty and vascular surgery (Outline surgery and artery and veins) (3) Thoracic Surgery

i.Outline clinical features and management of the following; fracture of ribs, Flail chest, stove in chest, Pneumothorax, Haemotho- rax, Lung contusion and Lacerration and injury to vessels and brounchus.

ii. Outline indications, contradiction, site of incision, pre and post operative management and complication of following- Lobectomy,

Book References

(SUBJECTS - CARDIO - THORACIC DISEASES AND SURGERY)

1. Cardiothoracic Surgery: Recent Advances and Techniques- by Daniel Willson
2. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine - By Douglas P. Zipes , Peter Libby
3. Textbook of Interventional Cardiology Hardcover – by Eric J. Topol MD and Paul S. Teirstein MD
4. Textbook of Pulmonary and Critical Care Medicine (vol 1&vol 2)by SK Jindal
5. Principles of Respiratory Medicine - by Farokh Erach, Zarir Farokh Udwadia, Anirudh Kohli Udwadia
6. Davidson's Principles and Practice of Medicine, International Edition
7. Murray & Nadel's Textbook of Respiratory Medicine – by Robert J. Mason MD
8. Bailey & Love's Short Practice of Surgery text book
9. Oxford Textbook of Fundamentals of Surgery- by William E. G. Thomas, Malcolm W. R. Reed, Michael G. Wya
10. Surgery by Nan.
11. Short Practice of Surgery by Rain & Ritelife.
12. Russell, R.C.G. Short practice In Surgery Arnold, London
13. Gupta, R. L. Text Book of Surgery Jaypee, New Delhi

COURSE CODE : B.P.T 404

Course Title: Physiotherapy in Cardio-thoracic disease and Surgical Conditions

Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using physiotherapy techniques for the management of common medical and surgical conditions affecting cardio respiratory system . The course is designed to provide knowledge in assessing and planning physiotherapy interventions for various conditions affecting cardiorespiratory system. 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. Besides Lecture and Bed-side demonstration , case discussion and tutorial should be preferred teaching methods . The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged.

Course Outcomes:

After completion of this course the student shall be able to

1. Demonstrate competencies in assessing and identifying physiotherapy related problems due to Respiratory diseases (Acute and chronic) Cardiac diseases (Acquired, Congenital and infective) Lung surgeries Open and closed heart surgeries Vascular surgeries Lung and cardiac transplantation
2. Demonstrate competencies in developing and implementing evidence based physiotherapy protocol in managing Respiratory diseases (Acute and chronic) Cardiac diseases (Acquired, Congenital and infective) Lung surgeries Open and closed heart surgeries Vascular surgeries Lung and cardiac transplantation
3. Demonstrate competencies in performing clinical exercise testing as part of clinical decision making
4. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders)

5. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format.

Demonstrate competencies in communicating effectively to the stakeholders including health care providers.

PT in Cardio- Respiratory conditions

1. Demonstrate competencies in assessing and identifying physiotherapy related problems due to
 1. Respiratory diseases (Acute and chronic)
 2. Cardiac diseases (Acquired, Congenital and infective)
 3. Lung surgeries
 4. Open and closed heart surgeries
 5. Vascular surgeries
 6. Lung and cardiac transplantation
24. Demonstrate competencies in developing and implementing evidence based physiotherapy protocol in managing
 1. Bed-side demonstration
Respiratory diseases (Acute and chronic)

2. Cardiac diseases (Acquired, Congenital and infective)

3. Lung surgeries

4. Open and closed heart surgeries

5. Vascular surgeries

6. Lung and cardiac transplantation

7. Demonstrate competencies in performing clinical exercise testing as part of clinical decision making.(SH)

8.Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders
(SH)

9.Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format. (SH)

10.Demonstrate competencies in communicating effectively to the stakeholders including health care providers. (SH)

•Lecture

•Tutorial

•Case discussion

•

• Virtual reality based training

• Simulation

- MCQs
- OSCE, OSPE,OSLER
- DOPS
- Portfolio

SECTION-A

Unit 1:

- Discuss the process of gaseous exchange
- Explain the possible factors which affects gaseous exchange
- Discuss the effect of impaired gaseous exchange on function

Unit 2: Cardio Respiratory Evaluation assessment

- Demonstrate skills to interpret the common investigations to identify problems that can be managed by physiotherapy
Discuss the principles of cardio respiratory assessment pertaining to physiotherapy clinical decision making

- Demonstrate skills in reading medical records to formulate physiotherapy related hypothesis

- Demonstrate skills in conducting subjective assessment

- Demonstrate skills in performing physical examination to identify the problems
 - Palpation
 - Chest expansion measurements
 - Percussion note
 - Tactile and vocal fremitus
 - Auscultation
 - Six minute walk test

- - Blood investigations
 - ABG
 - Chest X ray
 - PFT
 - ECG
 - Exercise testing report

- Demonstrate skills in selecting and applying appropriate outcome measures used cardio-respiratory care.
- Demonstrate skills in identifying impairments, activity limitations and participatory restrictions caused by cardio respiratory disorders with appropriate rationale
- Prioritise and formulate physiotherapy goals

Unit 3: Physiotherapy techniques in cardiorespiratory dysfunction

- Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for airway secretions
 - Positioning
 - Postural Drainage
 - Chest wall manipulation
 - Forced Expiratory techniques
 - Active Cycle of breathing techniques
 - Autogenic drainage
 - Positive Expiratory Pressure
 - IPPB

- **Demonstrate physiotherapy techniques used to clear airway secretions**
 - Positioning
 - Postural Drainage
 - Chest wall manipulation
 - Forced Expiratory techniques
 - Active Cycle of Breathing Techniques
 - Autogenic drainage
 - Positive Expiratory Pressure
 - IPPB

- Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for improving lung volume
 - Deep Breathing Exercise
 - Thoracic expansion exercise
 - Sustained maximal Inspiration
 - IPPB
 - CPAP

- **Demonstrate physiotherapy techniques used to improve lung volume**
 - Deep Breathing Exercise
 - Thoracic expansion exercise
 - Sustained maximal Inspiration
 - IPPB
 - CPAP

- **Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for reducing breathlessness**
 - Relaxation positions
 - Breathing control techniques
 - Pacing techniques

- **Demonstrate physiotherapy techniques used to reduce breathlessness**
 - Relaxation positions
 - Breathing control techniques

- Pacing techniques
- **Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to adjuncts used in respiratory physiotherapy care**
 - Humidification therapy
 - Aerosol therapy
 - Oxygen therapy
- **Demonstrate skills in selecting and administering**
 - Humidification therapy
 - Aerosol therapy
 - Oxygen therapy
- **Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with respiratory disorders (Acute exacerbations and chronic)**
 - Asthma
 - COPD
 - Interstitial lung disease
 - Bronchiectasis

- Pneumonia
- Pleural disorders

- Prioritise physiotherapy related problems based on the assessment in providing respiratory care
- Plan physiotherapy care with rationale for the identified problems in respiratory care
- Demonstrate skills in providing physiotherapy care for the identified problems in clients with respiratory disorders
- Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients undergone pulmonary surgeries
 - Lung volume reduction
 - Lung transplantation
 - Pleural surgeries
- **Demonstrate skills in providing physiotherapy care for the identified problems in clients undergone pulmonary surgeries**

- Define Pulmonary Rehabilitation
- Discuss the need for pulmonary rehabilitation
- Explain the components of Pulmonary Rehabilitation
- **Demonstrate skills in performing physiotherapy assessment in clients referred for pulmonary rehabilitation**
 - Subjective assessment
 - Physical examination
 - Exercise testing
 - Respiratory muscle testing
- **Prescribe exercise based on the assessment for the clients in pulmonary rehabilitation programme**

SECTION -B

Topic: Cardiac Rehabilitation

- **Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients' undergone cardiac surgeries**
 - CABG
 - Valve repair and replacement surgeries

- Cardiac pacemaker insertion
 - Surgeries to correct congenital heart disease
- Demonstrate skills in providing physiotherapy care for the identified problems in clients undergone cardiac surgeries
- Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with cardiac disorders
 - IHD
 - Cardiac Failure
 - Rheumatic heart disease
- **Prioritise physiotherapy related problems based on the assessment in providing cardiac care**
- **Plan physiotherapy care with rationale for the identified problems in clients with cardiac disorders**
- **Demonstrate skills in providing physiotherapy care for the identified problems in clients with cardiac disorders**
 - Define cardiac rehabilitation
 - Discuss the need for cardiac rehabilitation
 - Explain the components of cardiac Rehabilitation

- Appreciate the roles of other health care providers in cardiac rehabilitation
- **Demonstrate skills in performing physiotherapy assessment in clients referred for cardiac rehabilitation**
 - Subjective assessment
 - Physical examination
 - Exercise testing
- **Prescribe exercise based on the assessment for the clients in cardiac rehabilitation programme**

Critical care Physiotherapy

- Identify the common lines and tubes used in critical care units
- Interpret the ICU monitor and incorporate the findings in clinical decision making
- Analyse and Interpret the investigation procedures required to make physiotherapy diagnosis
- Identify and prioritize the problems which could be addressed by physiotherapists
- Discuss the Indications, Precautions to be taken, advantages and disadvantages of commonly used physiotherapy techniques based on available evidence

Design and discuss evidence informed physiotherapy protocol

Recommended Text Books

1. Cash's Textbook for Physiotherapists in Chest, Heart & Vascular diseases
2. Cash's text book in General Medicine & Surgical conditions for Physiotherapists
3. Chest Physical therapy & pulmonary rehabilitation -- Donna Frown Filter
4. Brompton's hospital guide
5. Physiotherapy in respiratory and cardiac problem - Pryor and Prasad
6. Physiotherapy in Cardio – Vascular rehabilitation –Webber
7. Chest physiotherapy in intensive care Colin Mackenzie
8. Mechanical ventilation – Ashfaq Hasan
9. Management of Mechanical ventilation –Pierce

RECOMMENDED REFERENCE BOOKS

1. Exercise & the Heart –Wenger
2. ECG – P.J.Mehta
3. Cardiopulmonary Physical Therapy -- IrwinScott
4. Essential of cardio pulmonary physical therapy –Hillgass And Sodosky
5. Exercise physiology, energy, nutrition and human performance –M'cardle
6. Exercise testing and prescription - Skinner 8. Exercise in health and disease-Pollock

COURSE CODE : B.P.T-405

Course Title : Physiotherapy in sports and Exercise Prescription

Subject Description and instruction to teacher

Involvement of physiotherapist in sports is a recent phenomenon. The purpose of this course is to sensitize the students on the importance of sports and physical activities in health promotion, and provides skills to ensure safe participation in sports. It prepares the students to offer primary and secondary care to the sports persons. 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. Besides lectures and demonstration exposure of students to the real sports situation in sports fields should be arranged. Use of simulation and dummies to acquire basic skills should be encouraged.

Course Outcomes:

After completion of this course the student shall be able to

1. Understand the importance of sports and physical activities in health promotion
2. Describe the methods for safe participation in sports and physical activities
3. Identify, evaluate, analyse and discuss the common acute and overuse injuries encountered in sports and plan initial management
4. Demonstrate the techniques used in the area of sports physiotherapy
5. Execute physical fitness testing of healthy population
6. Apply theoretical basis of physiological effects and best available evidence on effectiveness, efficacy and safe application of management guidelines
7. Understand the needs of specific population participating in sports

SECTION -A

Unit I

1. Introduction to Sports: importance of sports in health promotion, types of sports- contact , non-contact, team sports, individual sports, social economic importance of sports role of Physiotherapist in sports

2. Sports injuries types acute overuse, , soft tissue injury Stages of healing principles of Treatment for soft tissue injuries- Acute, Sub acute and chronic stages.

3. Safe participation: causes, risk factors of sports injuries, principles of Prevention of injuries in sports and physical activities, levels of prevention, methods of prevention- active measures passive measures, protective equipment

4. Management of Common sports injuries sprain, strain, contusion, laceration Lateral ligament sprain of ankle. Rotator cuff injuries. Collateral and Cruciate injuries of knee Meniscal injuries of knee Supraspinatus and Bicipital tendonitis Pre patellar and Sub-acromial bursitis Tennis and Golfer's elbow Hamstring strains, Quadriceps contusion, TA rupture Dequervain's tenosynovitis Trigger and Mallet finger Plantar fasciitis. Wrist sprains

5. Techniques of sports physiotherapy: Taping, bandaging, Moving the injured participant stretcher use Cardio Pulmonary Resuscitation; Causes of Collapse and Treatment of collapsed athlete, recovery methods

6 Rehabilitation In Sports

SECTION -B

Unit 2

7. Physical fitness definition – component of physical fitness(strength , endurance , flexibility power , aerobic and anerobic capacity agility , coordination , body composition) -description
8. Assessment of physical fitness : Physical Activities Readiness Questionnaire, Fitness Screening for Mental and Physical Fitness tests of individual components of fitness, Body Mass Index
- 9 Health, fitness, and wellness promotion: principles , methods cardiopulmonary endurance (continuous , intermittent, fartlack), anaerobic capacity, strength, flexibility, agility, coordination, health education, healthy nutrition , balance diet, relaxation
10. Health, fitness, and wellness issues of specific population groups: childhood and adolescence, , pregnancy, older adults hypertension diabetes
11. Special ability in sports : Paralympics sports, types, classification of athlete , specific problems
- 12 Guidelines For Exercise Testing and Prescription Benefits and Risks Associated with Physical Activity.
- 13 Pre participation Health Screening
- 14 General Principles of Exercise Prescription
- 15 Exercise Prescription for Healthy Populations with Special Considerations and
- 16 Topics for Exercise Prescription For Populations With Other Chronic Diseases and Health Conditions , Overweight and Obesity

Practicals

Students should be able to execute independently the following

1. Pre-participation examination for risk factor identification
2. Acute management of sports injuries
3. Testing of various components of fitness
4. Apply bandaging and taping for common sports injuries
5. Plan exercise programme based on impairment and activity limitation

Recommended text books

1. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
2. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
3. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
4. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann

Recommended Reference Books

1. Morris B. Mellion: Office Sports Medicine, Hanley & Belfus.
2. Bartlett R. Introduction to sports biomechanics: Analysing human movement patterns. Routledge;2007 Oct25.
3. William D. McArdle, Frank I.Katch, Victor L. KatchAstrand, P.-O. and Rodahl,K. Text book of Work Physiology Physiological basis of exercise
4. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams andWilkins.
5. D. Kulund: The Injured Athlete, Lippincott.

COURSE CODE BPT 406

Course Title : Ethics Laws and Management

Subject Description and instruction to teacher

Legal and ethical and management 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. Clinicians are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. The use of management principles in physiotherapy practice not only ensures quality of care but also provide insights into running a successful self-sustaining business model. The purpose of this course is to sensitize the students to various principles of ethics law and management in order to ascertain that they become a considerate, compassionate practitioner and successful entrepreneur.

Course Outcomes:

After completion of this course the student shall be able to

1. Compare and contrast the concept of morality ethics and legality and discuss the ethical issues pertaining to physiotherapy practice
2. Discuss the concept of professionalism and code of professional ethics and describe the salient features of national and international code of ethics related to health sciences as well as discuss the legal frame work of physiotherapy practice
3. Discuss the principles, elements of management and its relevance to physiotherapy practice
4. Discuss the principles and methods of quality control and skill necessary to run a physiotherapy clinic as entrepreneur

Theory

SECTION -A

Unit 1

1. Concept of Morality, Ethics and Legality Personal values- ethical or moral values

2 ethical issues in physiotherapy practice: Professionalism, informed consent, confidentiality, sexual and physical abuse, social characteristics, and personal relationships, professional issues ,Client interest and Satisfaction, Confidence and Communication, malpractice , negligence , rights of patients, liability and obligations

3. Professional ethics in research, education and patient care delivery

4. Professionalism, Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality. Core values- Accountability, Altruism, Compassion/ caring, excellence, integrity, professional duties, social responsibility Attitude and behavior- professional behavior professional accountability and responsibility, misconduct

5. code of professional conduct = Differences between professions and importance of team efforts Relationship with patients Relationship with health care institutions Relationship with colleagues and peers Relationship with medical and other professional Referral relationships

6. Salient features of Helsinki declaration , icmr code of ethics of research involving human subjects Ethical principles of WCPT

Unit 2

7. Laws governing physiotherapy practice - AHCPCA. Consumer protection law , People With Disability Act

8. Professional Indemnity insurance policy
9. direct access meaning and responsibilities The consulting process The skills of a good consultant Trust in the consultant/client relationship Ethical and legal issues in consultation
10. Development of Physiotherapy Profession

SECTION-B

Unit 3

11. Introduction to management and administration meaning definition scope , principles, elements of management relevance of management to physiotherapy practice
- 12..Planning : definition nature , principles of planning , advantage and disadvantages , component of planning [objectives ,policy , procedure , rules, methods, project , budget strategy }, types of plan process of planning , decision making
- 13.Organizing definition , steps in organizing ,types of organization , organizational chart heirarchy, authority , power , responsibility , accountability , delegation of authority , centralization , decentralization
14. Staffing: definition functions Manpower planning : according to organizational structure and needs Recruitment Training and development Appraisal Remuneration
15. Controlling and monitoring, types of control steps in control process methods of control [management information system. Quality Management System (QMS), Quality Assurance (QA) and Quality Control (QC) inventory, store Record keeping

Unit 4

16. Directing: definition, nature significance, **principles of directing elements of directing function** [supervision communication, motivation , leadership
17. Finance: MEANING, NATURE AND SCOPE OF FINANCE, Financial Goals, Finance Functions [investment decisions , dividend dicisions, financial decisions] budgeting
18. marketing, meaning , concept importance elements of marketing [product , price , promotion , physical distribution] , branding, pricing , advertising publicity social marketing advocacy and sensitization
19. Quality assurance : establishment of standards , audit – financial audit clinical audit , total quality management
20. Setting of a physiotherapy service unit Organization of physiotherapy department Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers

Recommended Text Books:

1. CM Francis Medical Ethics jay pee new delhi
2. Raja K **Davis F** Ethical Issues: Perspectives for the Physiotherapists pee pee brothers new delhi
3. Percival, T. (2014). *Medical ethics*. Cambridge University Press.
4. Dunn, M., & Hope, T. (2018). *Medical ethics: a very short introduction*. Oxford University Press.
5. Sakharkar BM Principles of hospital administration and planning jaypee brothers new delhi

Recommended Reference Books:

1. Hébert, P. C., & Rosen, W. (2009). *Doing right: a practical guide to ethics for medical trainees and physicians* (p. 352). Don Mills, ON: Oxford University Press.
2. American Medical Association, & New York Academy of Medicine. (1848). *Code of medical ethics*. H. Ludwig & Company
3. Blackburn, S. (2003). *Ethics: A very short introduction* (Vol. 80). Oxford University Press.
4. Joydeep Das Gupta Hospital Administration and Management: A Comprehensive Guide jaypee brothers

COURSE CODE: B.P.T - 407

Course Title: Community Physiotherapy and Rehabilitation

Subject Description and instruction to teacher

- 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 rehabilitating and restoring functions.

Course Outcomes:

After completion of this course the student shall be able to

1. Describe conceptual framework of rehabilitation with emphasis on roles of rehabilitation team members and various models of rehabilitation

2. Describe the concept and methods of epidemiology with emphasis on locomotor disability
3. Describe the concept of community based rehabilitation and outreach programme to rehabilitate persons with disabilities living in rural areas
4. Explain the principles of orthotics along with region wise uses and fitting
5. Describe Principles of prosthetics along with region wise uses and fitting
6. Describe the identification, and explain the process of rehabilitation of speech and hearing disability , visual disability , intellectual disability
7. Explain the principles of vocational rehabilitation including evaluation & vocational goals for people with disability
8. Apply the concept of Health Education
9. Understand about occupational therapy and importance of Activities of Daily Living and training of wheel chair activities, bed activities, transfer activities, locomotor activities and self care activities
10. Discuss about architectural barrier and possible modifications with reference to common disabling conditions
11. Outline the principles of disability evaluatio

THEORY

SECTION -A

Unit -1

1. National District Level Community Program: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.
2. Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise program, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation program for various neuro-musculoskeletal and cardiothoracic disabilities.
3. Assessment of disability in rural & urban setups. Health care delivery system & preventive measures with specific reference to disabling conditions. Community education program.
4. Application of Physiotherapy skills at community level with special reference to the need at rural level.
5. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies – National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockefeller, Ford foundation, CARE, RED CROSS

Unit 2

6. Introduction of Rehabilitation & History
7. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).

8. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.
9. Organization of Rehabilitation unit.
10. Disability prevention evaluation & principles of Rehabilitation Management.
11. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)
12. Brief outline of Communication disorder & its implications on Rehabilitation process.
13. Brief outline of psychosocial & vocational aspects of Rehabilitation.
14. Introduction to Occupational therapy.
15. Activities of daily living, functional assessment & training for functional independence.
16. Brief outline of basic community medicine with special reference to community based Rehabilitation, infrastructure and role of CBR
- 17 Disability and Rehabilitation: concept and Definition, models of disability international classification of functioning Definition and concept of Impairment, Handicap and Disability activity limitation , participation restriction, environmental factors , contextual factors Types. Coceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation Role of family members in the rehabilitation of a physically handicapped. Prevention of disability lawas related to disability people with disability act ,national trust act
- 18 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 Extension services and mobile units: Introduction, Need, Camp approach.
- 19 Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings. GOI guidelines

20. Principles of Orthotics- types, indications, contra indications , assessment (check out), uses and fitting –region wise.

Orthotics for the Upper Limb

Orthotics for the Lower Limb

Orthotics for the Spine

21 Principles of Prosthetics –types, indications, contraindications, assessment check out, uses and fitting – region wise

22 Assistive devices and Technologies.

23 Introduction to Occupational therapy Definition, scope and importance of Activities of Daily Living (ADLs)self-care activities , such as toilet , eating , dressing etc

SECTION -B

Unit 3

24 Identification, assessment and classification of intellectual disabilities Etiogenesis and principles of management including prevention Rehabilitation of the mentally subnormal, including vocational training & home education programme

25 Principles & mechanisms of Communication including speech & hearing
3 Common disorders of speech & hearing – etiogenesis, clinical features, assessment & principles of management

26 Identification, assessment and classification of visual disabilities Etiogenesis and principles of management including prevention
Rehabilitation of the mentally subnormal, including vocational training & home education programme

Unit 4

27 Vocational and social rehabilitation vocational and social aspects of disability , including evaluation & vocational goals for people with disability Role of social worker in rehabilitation

28 Architectural Barriers: Describe architectural barriers and possible modifications with reference to Rheumatoid Arthritis, CVA, Spinal Cord Injury and other disabling conditions. physical and architectural barriers for disabled,

29 Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education

30 **Occupational health & Ergonomics** - Occupational Hazards in the industrial area -- Accidents due to Physical agents-Chemical agents-Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses due to sedentary table work –executives, clerk, inappropriate seating arrangement- vehicle drivers constant standing- watchman- Defense forces, surgeons, Over-exertion in laborers,-common accidents –Role of P.T.-Stress management. 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

PRACTICAL demonstration :

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. And preparing and delivering community education program on various health and disability related issue for awareness ,prevention and care

Recommended Text Books

1. Handbook of Rehabilitation – Sunder
2. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis
3. Orthotics and prosthetic and assistive devices for physiotherapists by sinha, sharma and tripathy jaypee brothers
4. Park's Textbook of Preventive & Social Medicine - K.Park
5. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.
6. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting - Tuner, Forster & Johnson – Churchill Livingstone
7. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.

Recommended Reference Books

1. Status of Disabled in India -2000-RCI publication
2. Legal Rights of disabled in India- Gautam Bannerjee
3. ICF –WHO Health Organisation 2001publication
4. Training in the Community for the people with disability – Hallender Padmini

5. Mendes
6. Disabled Village Children—David Werner
7. Chorin C& M Desai, C Gonsalves, , Women & the Law, Vol. I & II Socio - legal Information Centre Mumbai
8. Hand Splinting – Wilson – W. B. Saunders.
9. Atlas of Limb Orthotics and Limb Prosthetics American Academy of Orthopedic Surgeons – Mosby.
10. Krusens Handbook of Physical Medicine and Rehabilitation.

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION

Should be the regular part of clinical education from third year on wards

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

INTERN DOCUMENTATION

1. **Initial Assessment Documentation:** An intern 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
3. **Case Presentations:** 12 case presentation is mandatory during the one year internship.

RESEARCH PROJECT- The candidate shall submit a project under the supervision of a physiotherapy faculty during internship 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

The interns shall maintain the record of work which is to be verified and certified by the Physiotherapy faculty under whom he/she works. Based on the record of work and project, The Internship completion shall be reported in the form of grades by the HOD/ principle while issuing “Certificate of Satisfactory Completion” of internship following which University shall award the BPT degree

All interneees will be assessed based on their satisfactory attendance, performance in the postings/ and the presentation of the logbook and project. The credits and hours of internship will be mentioned in transcript

The internship assessment weightage will be based on following criteria:

Domains	% of the total marks of the internship as- sessment
1. Attendance	10
2. Log book	60%
3. Project	30%

SKILLS BASED OUTCOMES AND MONITOR ABLE 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.



S No	Learning Outcomes	Knowledge/prehension	Com- Application/Synthesis/Evaluation
1.	Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes	<ul style="list-style-type: none"> • 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, professional colleagues, or family). • Identify client's prior functional abilities, physical performance, and participation. • Identifies the client's personal 	<ul style="list-style-type: none"> • 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. • Analyze how the differences in personality influence approach

S 1 No	Learning Out-comes	Knowledge/prehension	Com- Application/Synthesis/ Evaluation
2.	Collects as- sessment data relevant to the client's needs and physiother- apy practice.	<ul style="list-style-type: none"> • Informs the client of the nature and purpose of as- sessment as well as any associated significant risk. 	<ul style="list-style-type: none"> • Perform patient as- sessment technique which includes to know the condition and to gather in- formation about his/her ailment. • Monitors the client's health sta- tus for significant changes during the course of assess- ment and takes ap- propriate actions as required. • Perform assessment procedure safely and accurately, taking into account client consent, known in- dications, guide- lines, limitations and risk-benefit considerations.

S No	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	<ul style="list-style-type: none"> • 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 proce 	<ul style="list-style-type: none"> • 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 patients/client's impairments, activity limitations and participation restrictions.

S I No	Learning Outcomes	Knowledge/prehension	Com- Application/Synthesis/Evaluation
4.	Analyzing assessment findings & Establish a physiotherapy diagnosis and prognosis.	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. • Formulates a physiotherapy diagnosis based on the analysis of patients assessment findings. • Discusses physiotherapy diagnosis and prognosis with the patient & care givers

S No	Learning Outcomes	Knowledge/ prehension	Com- Evaluation
5.	Develops and recommends an intervention strategy.	<ul style="list-style-type: none"> • 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 multi-disciplinary team 	<ul style="list-style-type: none"> • 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.

S 1 No	Learning Out-comes	Knowledge/prehension	Com-comes	Application/Synthesis/Evaluation
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	<ul style="list-style-type: none"> • Orients the client to the practice setting and 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). 	<ul style="list-style-type: none"> • Performs physiotherapy interventions in accordance with client consent and in a safe and effective manner. • Educates the client about health promotion, self-management, and relevant services with respect to his/her unique condition. 	

S No	Learning Outcomes	Knowledge/ Comprehension	Com- Application/Synthesis/ Evaluation
8.	Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises	<ul style="list-style-type: none"> • Discuss the importance of exercises and how it should be carried out • Be familiar with the treatment plans for all patients on the treatment unit • Identify the co-morbidities that will impact on patient condition • Recognize if any adverse reactions is occurring 	<ul style="list-style-type: none"> • Interpret the treatment plan and use the equipment accordingly • Teach patients the exercise procedures and methods of doing them. • Evaluate the patient's general condition prior to commencing the exercises. • Analyze the information and integrate to define the optimal patient condition
9.	Advise patient on appropriate nutrition, exercises, rest, relaxation other issues	<ul style="list-style-type: none"> • Explain the impact of exercise and nutritional status of patient during treatment 	<ul style="list-style-type: none"> • Assess the patient's status after exercise and proper diet.

S I No	Learning Out-comes	Knowledge/prehension	Com- Application/Synthesis/ Evaluation
10.	Evaluates the effectiveness of interventions.	<ul style="list-style-type: none"> • Discuss with the client, the nature, purpose and results of ongoing assessment and outcome evaluations. • Consults with the patient to redefine goals and modifies or discontinues intervention strategies as necessary. 	<ul style="list-style-type: none"> • Monitors client responses and changes in status during the interventions and modifies intervention accordingly. • Evaluates effectiveness of the intervention strategy on an ongoing basis using appropriate outcome measures. • Assesses client status prior to the completion of physiotherapy service and compares with initial assessment findings. • Communicates with the client about service completion & recommends self-management option.

S I No	Learning Out-comes	Knowledge/ prehension	Com- Application/Synthesis/ Evaluation
11.	Be able to complete accurate treatment documentation.	<ul style="list-style-type: none"> • Recognize the importance of accurate transfer of information to allow for accurate treatment set-up according to the treatment plan and prescription. • Know what should be included & whom or where the documentation and information should be sent. • Be aware of the ethical issues relating to documentation 	<ul style="list-style-type: none"> • Ensure that the ethical and legal requirements of documentation are completed. • Ensure legible, accurate and timely records are maintained. • Ensure statistical information is recorded and accessible.

S I No	Learning Out-comes	Knowledge/prehension	Com-Application/Synthesis/Evaluation
12.	Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.	<ul style="list-style-type: none"> • Be familiar with the psychological status of the patient. • Knowledge of few counseling procedures. 	<ul style="list-style-type: none"> • 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.

S I No	Learning Out-comes	Knowledge/prehension	Com-Application/Synthesis/ Evaluation
13.	Establishes and maintains inter professional relationships, which foster effective client-centered collaboration.	<ul style="list-style-type: none"> • Integrates knowledge and understanding of the physiotherapist role and the roles of others in providing client-centered care. • Consults and shares relevant information with clients, other health professionals, and all relevant individuals or groups in a timely manner. 	<ul style="list-style-type: none"> • 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.

S I No	Learning Out-comes	Knowledge/ prehension	Com-	Application/Synthesis/ Evaluation
14.	Understand the principles of continuous quality improvement	<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • Modify and adapt professional practice in response to evaluation and/or feedback from the patient/client, peer, supervisor Con-tribute to in-service activities • Reflect on the out-comes of interven-tions and modify practice accord-ingly
15.	Be able to carry out the daily/weekly Quality Control (QC) checks	<ul style="list-style-type: none"> • Explain Quality Management Sys-tem (QMS), Qual-ity Assurance (QA) and Quality Control (QC) 		<ul style="list-style-type: none"> • Perform the daily/weekly/ monthly QC procedures
16.	Be able to re-view the litera-ture	<ul style="list-style-type: none"> • Define search terms for specific treatment sites 		<ul style="list-style-type: none"> • Identify the appro-priate literature in the area of interest. • Identifying research gap.

S No	Learning Outcomes	Knowledge/ prehension	Com-	Application/Synthesis/ Evaluation
17.	Be able to suggest implementation of research findings	<ul style="list-style-type: none"> • Identify relevant sources of Research 		<ul style="list-style-type: none"> • Evaluate research with respect to current departmental practice
18.	Be able to suggest/ initiate topics for physiotherapy research	<ul style="list-style-type: none"> • Identify literature to support research proposal • Define the necessary steps in preparing and carrying out research 		<ul style="list-style-type: none"> • Review the literature in the area. • Formulate a research question. • Conducts research systematically.
19.	Be able to interpret, apply and disseminate information as a member of the physiotherapy team	<ul style="list-style-type: none"> • Define and explain the data that must be disseminated 		<ul style="list-style-type: none"> • Identify the appropriate personnel to whom specific information should be disseminated. • Communicate the correct, relevant and appropriate information



MASTER OF PHYSIOTHERAPY [M.P.T]

Master Of Physiotherapy [M.P.T]

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 advanced knowledge and skills related to the respective branch of specialty.
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 primary and secondary 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,-Various situation and places related to the specialty-
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) and other members as per the policy of institute/ university, 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 minimum 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. Acquisition of practical competencies being the keystone of post graduate medical education, post graduate training should be skills oriented. Learning in post graduate programme should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort. 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, case presentations, 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.

Formal teaching sessions [minimum]

At least 4-hrs of formal teaching per week per subject is necessary. The departments may select a mix of the following sessions:

Journal club Once a week

Seminar; lecture Once a week

Case discussions Twice a week

Interdepartmental case or seminar Once a week

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 programmes 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 or 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 shall be produced as and 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)

Category	I year MPT	II year MPT
O	20 Cases	20 Cases
A	20 Cases	30 Cases

PA		100 Cases
PI		20 Cases

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
 - Participation³⁹⁴ in conferences/ presentation of paper -Minimum 2 in two years

- Any other – Specify (eg : CME)
- Rotation and posting in other departments for a maximum of 6 months the candidate must spend 18 months in the department of specialty concerned

INTAKE OF STUDENTS

The guide to student's ratio shall be 1:3 for admission in first year M.P.T. and cannot be extended in any case. Guide should be of the same post graduate degree. The intake of students to the course shall be at the starting of academic year only

Maximum 21 students can be admitted per academic year in an institution .

GUIDE

a) QUALIFICATION OF GUIDE: The academic qualification and teaching experience required for recognition as guide is 5 years of teaching experience after post-graduation as lecturer/assistant professor.

. Students cannot be left without guide for more than 3 months total during their post graduation study. (i.e in the event of resignation of guide college should appoint the guide within 3 months as per the essential criteria of guide) or as prescribed by University/Government.

Guide should be of the same elective of students.

b) CHANGE OF GUIDE In the event of registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university but as per the mentioned guideline here before.

For benefit of students services of visiting faculty can be utilized, but these faculty members will not be counted in the PG teachers and they cannot register candidates

Assessment:

FORMATIVE ASSESSMENT

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system

Quarterly assessment during the MPT training shall be done by the faculty members of the department based on: 1. Journal based / recent advances learning 2. Patient based /Laboratory or Skill based learning 3. Self directed learning and teaching 4. Departmental and interdepartmental learning activity 5. External and Outreach Activities. It may be structured and assessment be done using checklists that assess various aspects

SUMMATIVE ASSESSMENT

Theory Examination:

Clinical / Practical and viva voce Examination : All examiners shall be recognized post graduate teachers. At least 50 % of total examiners shall be external. (from Other universities)

Dissertation Thesis shall be submitted at least three months before the Theory and Clinical / Practical examination. The thesis shall be examined by a panel of three examiners; one internal and two external examiners, who shall also be the examiners of Clinical examination.

Practical / examination practical examination shall be conducted at the end of second year by a panel of 3 examiners out of which two should be from other institution and one of them must be from outside state.

practical examination should be conducted in two days

on day one exam for clinical and teaching skills and viva voce should be conducted .

on second day dissertation should be examined - student shall make a 15 minute presentation of dissertation followed by 10 minute question answer by examiners .

marks to be awarded separately by each examiner and an average shall be taken as the final marks awarded to the student in both practical as well as dissertation

EXAMINERS : A Postgraduate exam in Physiotherapy examiner should have minimum of five years teaching experience in a recognised Physiotherapy college in that particular Speciality.

Physiotherapy Post Graduate education prepares a person for independent practice in Specialities and involves extensive clinical training in almost every speciality and super speciality of modern medicine. Henceforth, new Post Graduate Physiotherapy College/institute can only be established in NMC recog-

nized medical college. Notwithstanding New Physiotherapy College to be started in NMC recognized medical college will need to fulfill all the essential requirement as following. However the institute may share common facilities, faculties and infrastructure with the medical college.

All existing physiotherapy colleges/ institute will continue to impart physiotherapy education provided that following conditions are fulfilled:-

Essential Requirements For MPT Institution

ELIGIBILITY

a) Any government /Private/ Self Financing Educational Trust/Charitable Trust/Society/Company registered under the relevant Act, applicant will be eligible to apply.

b. College should be running BPT programme for last 5 years

c. Standalone MPT programme can be started in institutions having NMC approved medical college and are willing to share its facilities for the teaching and research of MPT students.

d. Standalone MPT programme can be also be started by the institutes of national importance and institution of eminence in their campus if they run post graduate programme in other disciplines of healthcare.

Physical infrastructure

Whole campus should be accessible for persons with disabilities.

Administrative Office *Land and space requirement*

There shall be no separate land required for starting MPT course subject to fulfillment of eligibility criteria to start the MPT programme. However the essential requirements in terms of physical infrastructure, Manpower as given below must be furnished

1)

2) Rooms for faculty [per specialty]

a. Professor 1

b. Associate professor 1

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c. Assistant professor 2

3) Common room for students

4) Toilets for men

Toilet for women Classroom - 02 rooms of 400 sq.ft. (each).

1) Laboratory - each specialty lab shall have area of 800 sq.ft. area

The laboratories should be provided with the mandatory equipment as specified under equipment requirements of specialties.

Standalone MPT institute must have Exercise therapy/ Kinesiotherapy Lab and Electrotherapy Lab (with atleast one equipment of each category as mentioned for BPT Program)

Staff Requirement (Student faculty ratio)

Professor 3:1

Assoc Prof 2:1

Asst prof 2:1

Minimum Equipment requirements for MPT specialties

Fully equipped Electrotherapy Lab, exercise therapy labs are mandatory for master of physiotherapy programs. For each postgraduation speciality of physiotherapy (MPT) program fully equipped corresponding department for undergraduate physiotherapy (BPT) program is mandatory. If the institute is offering BPT then same lab and infra structure may be used for MPT programs in addition to following program specific list. In stand alone MPT institution fully equipped Electrotherapy Lab, exercise therapy labs (as prescribed under BPT program with atleast one equipment for each category) are mandatory.

Neuro-Physiotherapy Laboratory [Minimum One Unit Each]

1. Neuro-Exercise Unit
2. 4 Channel EMG with nerve-conduction testing facility
3. Biofeedback unit with the facility to do quantitative analysis and therapy
4. Sensory integration kits
5. Balance boards
6. Video camera and player (with jog shuttle facility) for movement analysis desirable
7. Gait analyser-
8. Balance analyser and balance trainer
9. Functional Electrical Stimulator
10. Transcranial Magnetic stimulation device
11. Transcranial Direct current stimulation device
12. Virtual reality device
13. Mirror therapy
14. Unweighing harness system with treadmill
15. Tilt table
16. Dynamometers
17. Robotics for upper limb and lower limbs- Desirable

18. Gait belts

2. Orthopedic Physiotherapy Laboratory-

1. Dynamometer – myometre

- 1) Electronic goniometry
- 2) Algometre
- 3) Hand Evaluation kit
- 4) Biofeedback unit with facility EMG unit with integrated analysis software provided
- 5) Video camera and player (with jog shuttle facility) for movement analysis
- 6) Isokinetic Unit – desirable
- 7) Motion analysis
- 8) Continuous passive motion devices
- 9) Shock wave unit
- 10) Spinal Decompression unit
- 11) Attachment with prosthetic orthotic unit

3. Cardio-Pulmonary Laboratory-

1. Treadmill / Bicycle Ergo meter with facility for TMT
2. Spiro meter Portable
3. Pulmonary function test unit

4. Suction apparatus

Peak Flow meters

1. Pulse Oximeters
2. Mannequin for CPR training
3. Flutter
4. Fat fold caliper 6
5. BiPAP/CPAP – desirable
6. Body Composition analyzer- desirable
7. Energy Consumption analyzer – desirable
8. Couches pillows bed sheets chairs

3.Paediatric physiotherapy Laboratory-

- 1)Well-equipped Play room
- 2)Sensory Integration Room
- 3)Swiss balls
- 4)Positioning devices
- 5)Attachment to a CHC is a must
- 6)Ball pool
- 7)Audio-Visual room

8)Accessibility to a mobile Physiotherapy Unit is desirable

9)Attachment with prosthetic orthotic unit

10)Couches pillows bed sheets chairs

4) Sports Physiotherapy Laboratory-

1. Fitness measurement instrumentation

2. Access to advanced sports centre/gymnasium

3. Hydrotherapy pool for underwater treadmill /bicycle

4. Sauna bath

5. Medicine ball/ Swiss balls Thera bands

6. Equipment for anthropometric measurements

7. Body composition analyser

8. Mannequin for CPR training

9. Biofeedback unit with facility EMG unit with integrated analysis software provided

10. Video camera and player (with jog shuttle facility) for movement analysis desirable

11. Isokinetic Unit – desirable

12. Equipment for Motion analysis – desirable

13. Tie up with a sports team

5. Obstetrics and Gynecology Physiotherapy:

- 1) Mirror
- 2) Ultrasound machine
- 3) TENS
- 4) IFT
- 5) Electrical stimulator with vaginal electrode
- 6) Perineometer
- 7) Vaginal cones with different weights
- 8) Pressure biofeedback
- 9) Medicine ball/ Swiss balls
- 10) Mirror
- 11) Dumbbells set/Therabands/Theratubes
- 12) Weighing machine 7
- 13) Facility for on call Medical Officer
- 14) Low mats/Chairs

6.. Oncological Physiotherapy

Pneumatic compression therapy unit with accessories for both upper and lower limbs	Two
EMG Biofeed back Unit	One
Muscle stimulator	One
Interferential Therapy Unit	One

Attachment with tertiary care oncological hospital

Library:

In addition to books requirement for undergraduate teaching additional adequate reference books to cater to the post graduate studies should be provided. Minimum 5 indexed international journals should be provided for with additional journal in each elective area/speciality. In addition, reference books,

Audio visual facility,

Slide projector,

Computer, Internet facility is to be provided.

Clinical Facilities:

If the course is in the premises of NMC permitted/recognized Medical College as constituent college, there is no requirement for attachment of any other hospital or else Memorandum of Understanding for clinical training should be made with specialty hospitals having the specialty of Musculoskeletal/ Trauma Units, Neurology/ Neurosurgery, Cardio Pulmonary unit with intensive care facilities, paediatrics, Community Physiotherapy and Sports unit. In either case each teaching unit shall accommodate 6 PG students only. Both training on in-door as well as outdoor patients should be provided for.

Human resource requirement

Teaching Faculty

Professor 1

Associate professor 1

Assistant professor 2

Services of visiting faculty can be utilized, but these faculty members will not be counted in the PG teachers and they cannot register candidates

Non teaching staff

Office superintendent/ assistant 1

Computer operator 1

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.¹⁵ 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.

Curriculum Outline

Common subjects for all PG

1. Laws, Ethics, Administration,
2. Educational methodology
3. Research methodology, EBP and biostatistics
4. Exercise physiology
5. Practical / clinical examination
6. Dissertation

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¹⁵ Enhancing youth employability: the importance of core work skills. Skills for employment: policy brief [Internet]. 2013. Available from: http://www.i-lo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_234467.pdf.

General design for specialities

7. Clinical and functional diagnosis in speciality
8. Concepts of speciality

Recent advances in the specialty

SPECIALITY OFFERED

1. Master of Physiotherapy in Musculoskeletal science
2. Master of Physiotherapy in Neuroscience
3. Master of Physiotherapy in Cardio-Pulmonary science
4. Master of Physiotherapy in Sports science
5. Master of Physiotherapy in Pediatrics and neonatal sciences
6. Master of Physiotherapy in Obstetrics and Gynecological science
7. Master of Physiotherapy in Community Physiotherapy
8. Master of Physiotherapy in Oncological science

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

Annual Pattern First Year M.P.T Examination

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total	Theory hours	practical hours	Total Hours	Cred-its	Credits	Cred-its
							Mark s				Theo-ry		Practi-cal
		Theo-ry	Practi-cal	Theo-ry	Viv a	Practi-cal							
1	M.P.T -101 Laws, Ethics, Administration Educational methodology	20		80			100	90		90	6	0	6
2	M.P.T-102 R e s e a r c h methodology and biostatistics	20		80			100	90		90	6	0	6

3	M . P . T - 1 0 3 B I O M E - C H A N I C S & T H E R A P E U - T I C S	20		80			100	90		90	6	0	6
4	M.P.T -104 <i>Speciality pa- per 1</i>	20	20	100	20	40	200	120	120	240	8	4	12
5	M.P.T-105 Skills acquisition and re- f i n e m e n t (Teaching As- signment, Sem- inars, journal club & Case Studies etc.)	0	0	0	0	0	0	0	240	240	0	8	8

6	Clinical training	0	0	0	0	0	0	0	540	540	0	18	18
7	Dissertation								240	240	0	8	8
	Grand Total						500	390	1140	1530	26	38	64

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

SEMESTER PATTERN First SEM. M.P.T Examination

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total	Theory hours	practical hours	Total Hours	Cred-its	Credits	Cred-its
							Mark s				Theo-ry		Practi-cal
		Theo-ry	Practi-cal	Theo-ry	Viv-a	Practi-cal							
1	M.P.T-101 Laws, Ethics, Administration Educational methodology I	10		40			50	45		45	3	0	3
2	M.P.T-102 Research methodology and biostatistics I	10		40			50	45		45	3	0	3

3	M.P.T-103 B I O M E- CHANICS & THERAPEU- TICS I	10		40			50	45		45	3	0	3
4	M.P.T-104 <i>Speciality pa- per 1 PART A</i>	10	10	50	10	20	100	60	60	120	4	2	6
5	M.P.T-105 Skills acqui- sition and re- f i n e m e n t (Teaching As- signment, Sem- inars, journal club & Case Studies etc.) I	0	0	0	0	0	0	0	120	120	0	4	4
6	Clinical train- ing PART I	0	0	0	0	0	0	0	270	270	0	9	9
7	Grand Total						250	195	570	765	13	19	32

N.B.-

1. Setting Question Paper will be done as per the subjects in Annual Patten or Section A and Section B of Syllabus in Semester Pattern.
- 2.Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.
3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination,But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

SEMESTER PATTERN 2ND SEM. M.P.T Examination

S. N o.	Subject	Internal As- sessment Marks		University Exami- nation Marks			To- tal Mar ks	Theo- ry hours	practi- cal hours	Total Hour s	Cred- its	Credits	Cred- its	
		Theo- ry	Practi- cal	The- ory	Viv a	Prac- tical					Theo- ry	Practi- cal	Total	

1	M.P.T-101 Laws, Ethics, Administra- tion Educa- t i o n a l methodology II	10		40			50	45		45	3	0	3
2	M.P.T-102 R e s e a r c h methodology and biostatis- tics II	10		40			50	45		45	3	0	3
3	M.P.T-103 B I O M E- CHANICS & THERAPEU- TICS II	10		40			50	45		45	3	0	3
4	M.P.T-104 <u>Speciality pa- per I PART B</u>	10	10	50	10	20	100	60	60	120	4	2	6

5	M.P.T-105 Skills acquisition and refinement (Teaching Assignment, Seminars, journal club & Case Studies etc.) II	0	0	0	0	0	0	0	0	120	120	0	4	4
6	Clinical training PART II	0	0	0	0	0	0	0	0	270	270	0	9	9
7	Grand Total						250	195		570	765	13	19	32

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

Annual Pattern 2ND Year M.P.T Examination

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	practical hours	Total Hours	Credits	Credits	Credits	
		Theory	Practical	Theory	Viva	Practical					Theory	Practical	Total	
1	M.P.T-201 <u>Exercise Physiology</u>	20		80			100	90		90	6	0	6	
2	M.P.T-202 <u>Speciality Paper 2</u>	20	20	80	20	40	200	120	120	240	8	4	12	

3	M.P.T-203 <u>Speciality paper 3 Recent advances in the specialty</u>	20	20	80	20	40	200	120	120	240	8	4	12
4	M.P.T-204 <u>Dissertation [spread over a period of 18 months]</u>	0	0	100	0	100			720	720			24
5	M.P.T-205 Skills acquisition and refinement (Teaching Assignment, Seminars, journal club & Case Studies etc.)								240	240	0	8	8

6	Clinical training								540	540	0	18	18	
	Grand Total						600	330	1740	2070	22	58	80	

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

SEM. PATTERN 2ND Year[3RD SEM] M.P.T Examination

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	practical hours	Total Hours	Credits	Credits	Credits	
		Theory	Practical	Theory	Viva	Practical					Theory	Practical	Total	
1	M.P.T-201 <u>Exercise Physiology I</u>	10		40			50	45		45	3	0	3	
2	M.P.T- 202 <i>Speciality Paper 2 I</i>	10	10	40	10	20	100	60	60	120	4	2	6	

3	M.P.T-203 <i>Speciality paper 3 Recent advances in the specialty I</i>	10	10	40	10	20	100	60	60	120	4	2	6	
4	M.P.T-204 <i>Dissertation [spread over a period of 18 months]-I</i>	0	0	0	0	0	50		360	360			12	
5	M.P.T-205 Skills acquisition and refinement (Teaching Assignment, Seminars, journal club & Case Studies etc.)									120	120	0	4	4

6	Clinical training								270	270	0	9	9	
	Grand Total						300	165	870	1035	11	29	40	

N.B.-

- 1. Setting Question Paper will be done as per the subjects in Annual Pattern or Section A and Section B of Syllabus in Semester Pattern.**
- 2. Viva marks will be added in theory marks along with internal assessment theory; candidate have to get min. 50% marks in theory and viva collectively for passing the examination.**
- 3. The [NUE] Subjects will on college level and students needs to pass the college level examination before appearing for the University Examination, But the marks will be counted with University Marks and will be added in the Scheme and Marks Sheet given by University.**

SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)
SEM. SYSTEM 2ND Year[4TH SEM] M.P.T Examination

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total	Theory hours	practical hours	Total Hours	Credits	Credits	Credits	
							Mar ks				Theory		Practical	
		Theory	Practical	Theory	Viva	Practical								
1	M.P.T-201 Exercise Physiology II	10		40			50	45		45	3	0	3	
2	M.P.T-202 Speciality Paper 2 II	10	10	40	10	20	100	60	60	120	4	2	6	

3	M.P.T-203 Speciality paper 3 Recent advances in the specialty II	10	10	40	10	20	100	60	60	120	4	2	6
4	M.P.T-204 Dissertation [spread over a period of 18 months] II	0	0	0	0	0	50			360			14
5	M.P.T-205 Skills acquisition and refinement (Teaching Assignment, Seminars, journal club & Case Studies etc.)-II								120	120	0	4	4
6	Clinical training								270	270	0	9	9
	Grand Total						300	165	870	1035	11	29	40

B. Dissertation – The topic of dissertation will be allocated in Second Semester and candidate will work for 2 semesters and submit a written thesis in 4th semester. The student will be awarded grade for the total number of credits earned in dissertation in II, III and IV semesters of study at the end of the IV semester.

M.P.T Detailed syllabus

Common papers

COURSE CODE -M.P.T-101

COURSE TITLE - Laws, Ethics & Administration

Content

SECTION -A

ETHICS AND LAW

Principles of ethics History and evolution of ethics - Helsinki declaration; Nuremberg Code; Principles of ethics and its importance - Autonomy, Beneficence, Non-maleficence, Justice

Professionalism

Ethics in professional practice Principles of practice in respective profession. Privacy, confidentiality, shared decision making, informed consent, equality and equity, justice

ICMR Guidelines General principles, Responsible conduct of research, Risk benefit assessment

Informed Consent Process Components of informed consent document, Procedure in obtaining informed consent, Special situations, waivers, and proxy consent

Roles and Responsibilities of IEC Ethical Review process, Classification of projects for review, Roles and responsibilities of members, Communications with investigators and authorities

Ethics in Special and Vulnerable Populations Types of Vulnerability and vulnerable population, Challenges for research in vulnerable population, Guidelines for research in special and vulnerable population

Conflict of Interest Definition and Types of Conflict of Interest, Identifying, mitigating and managing Conflict of Interest, Conflicts of interest in international collaborations

Publication Ethics Importance of publishing, Authorship guidelines according to ICMJE, Plagiarism

Laws governing physiotherapy practice: NCAHP Act, Consumer Protection Act , Rights of persons with disability act

Ethical issues in practice of physiotherapy-Clinical, Research and Academics

SECTION -B

Management and administration in physiotherapy

Principles and applications of Management and Administration to Physio Therapy practice:

Management PROCESS : planning, organizing, staffing, finance, marketing, controlling, directing.

Quality assurance: Total Quality Management: basis of quality management, quality assurance program in hospitals, medical addit and international quality system.

COMMUNICATION : Process of Communication Barriers to Communication Types of Communication Written vs. Oral Communication Elements of good communication

Hospital as an organization: functions and types of hospitals MANAGEMENT IN HOSPITAL
Setting of a physiotherapy service unit

MANAGEMENT OF TEACHING INSTITUTION

Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities,

Educational Methodology in Physiotherapy

Education: definition, aims and objectives of education, Agencies of education, Formal and informal education, brief introduction to the philosophies of education, taxonomy of educational objectives, essentials of physiotherapy education, NEP

Basics of Adult Learning Theories including Learning Styles and Motivation

Concept of teaching – learning - nature of learning, type and stages of learning , factors affecting learning , laws of learning , learning style teaching learning process, role of teacher in teaching learning process, Adult learning

Teaching skills, Teaching Methods in Classroom Setting, clinical teaching methods, planning of teaching: lesson planning and unit planning

Teaching aids and educational technology

Formulating Intended Learning Outcomes Including Tyler’s principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition

Curriculum: meaning and concept of curriculum, factors affecting curriculum, Types of curriculum, Competency based education (CBE) and outcome based education (OBE) basic principles of curriculum construction, and steps of curriculum development . curriculum evaluation

Assessment and evaluation : meaning and concepts of assessment , measurement evaluation and examination , purpose of evaluation, types of evaluation, principles of evaluation, techniques of evaluation, methods and tools used in testing of knowledge, skill, clinical performance and attitude,

Faculty development, continuing professional education

Recommended books

1. Beauchamp and Childress, Principles of Biomedical Ethics, Fourth Edition. Oxford.
2. Patricia A Marshall. Ethical challenges in study design and informed consent for health research in resource poor settings. World Health Organization. 2007.
3. National Ethical guidelines for Biomedical and Health Research involving human participants. Indian Council of Medical Research. 2017.

4. ABC of Learning and Teaching in Medicine. Editor(s): Peter Cantillon, Diana Wood, Sarah Yardley. Ed: 3
5. Understanding Medical Education: Evidence, Theory, and Practice, Editor(s): Tim Swanwick Kirsty Forrest Bridget C. O'Brien. Ed 3
6. Principles of Medical Education. Editor(s): Tejinder Singh, Piyush Gupta, Daljit Singh. Jaypee Brothers. 2012. NewDelhi.

COURSE CODE -M.P.T-102

COURSE TITLE - Research methodology and Biostatistics and Evidence based practice

SECTION-A

Unit 1

RESEARCH METHODOLOGY

1. Introduction to research
2. Types of research
3. Defining a research question
4. Qualitative study designs
5. Quantitative study
6. Type I and type II bias
7. Study design: types
Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.
8. Sampling design, calculating minimum sample size based on design
9. Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.
10. Outcome measures: Use of outcome measures in rehabilitation research
11. Research Methods: Designing methodology, Reporting results, Type I and Type II bias.

12. Communicating research.
13. Evaluating published research: looking at the evidence
14. Introduction to evidence based practice, evaluating evidence,
15. Asking clinical questions
16. Translating of evidence into practice: strategies
17. Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

SECTION-B

Unit 2

SCIENTIFIC WRITING

1. Definition and kinds of scientific documents – Research paper, Review paper, Book , Reviews, Thesis, Conference and project reports (for the scientific community and for funding agencies).
2. Publication – Role of author, Guide, Co-authors.
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.

Structure of Thesis and Content – Preparing Abstracts.

BIOSTATISTICS

1. Descriptive Statistics and measurement variability
2. Inferential Statistics
3. Comparison of group means: T-test
4. Analysis of variance
5. Multiple comparison tests
6. Parametric⁴²⁸ and Non parametric tests

7. Correlations
8. Regression
9. Analysis of frequencies: Chi square
10. Statistical measure of validity and reliability
11. Factorial Design analysis
12. Power analysis – Determining sample size, Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio
13. Application of various statistical software.

Recommended books

1. Bailey, N.T.J. -Statistical methods in Biology. The English universities press, London
2. Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
3. Colton - Statistics in medicine, Little Brown Company, Boston
4. Gupta, S.P -Statistical methods. Sultan Chand and Sons Publishers , New Delhi.
5. Goulden C.H.- Methods of Statistical Analysis. Asia Publishing House , New Delhi.
6. Mohsin S.M.- Research Methods in Behavioral Sciences: Orient Publications. New Delhi.
7. Mahajan - Methods in Biostatistics, Jay Pee Brothers.Medical Publishers (P) Ltd. New Delhi.
8. Hicks- Research for Physiotherapists, Churchill Livingstone, London.
9. Meenakshi. - First Course in Methodology of Research. Kalia Prakashan, Patiala.
10. Kumar , R.- Research Methodology. Pearson Education , Australia.
11. Snedecor,G.W -Statistical Methods, Allied Pacific Pvt. Ltd., London
12. Singh, I.- Elementary Statistics for Medical Workers. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.
13. Rehabilitation Research: Principles and Applications by Elizabeth Domholdt (Elsevier Science Health Science Div, 2004)

COURSE CODE -M.P.T-103

COURSE TITLE -BIOMECHANICS & THERAPEUTICS

SECTION- A

SECTION A – Concepts of Biomechanics:

- I. Introduction to Kinesiology and Biomechanics. Biomechanics of Tissues and structures of the musculoskeletal system
- II. Principle of Biomechanics
- III. Nature and importance of Biomechanics in Physiotherapy.
 - IV Methods of kinetics and kinematics investigation
 - V. Introduction to biomechanical analysis of human motion.
 - VI Analytical tools and techniques –
 - a) Isokinetic Dynamometer,
 - b) Kinesiological EMG,
 - c) Electronic Goniometer,
 - d) Force Platform,
 - e) Videography.
 - VII.Upper Extremity: Shoulder and Shoulder girdle, Elbow joint, Wrist joint and Hand.
 - VIII.Lower Extremity: Pelvic Girdle, Hip joint , Knee joint, Ankle & Foot
 - IX. Spine
 - X.Gait
 - i. Gait Analysis: Kinetic & Kinematic Analysis.
 - ii. Pathological Gait: Kinetic & Kinematic Analysis
 - XI.Ergonomic approach to lifting and handling, workspace and environment. Patient positioning, body mechanics and Transfer techniques

SECTION-B

UNIT 2

Physiotherapy techniques

- I. Principle of therapeutic exercises
- II. Definition, details of effects and uses of following exercises.
 - a. Dynamic Exercises
 - b. Plyometric Exercises
 - c. Isokinetic Exercises
 - e. Kinetic chain exercises
- III. Balance and coordination exercises
- IV Biophysics of contractile and non contractile tissues, Response to mechanical loading
- V.Clinical reasoning and differential clinical diagnosis based on various approaches such as Maitland, Kaltenborne, Cyriax, Mulligan, Mckenzie etc.
- VI Proprioceptive neuromuscular Facilitation,
- VII Hydrotherapy Techniques
- VIII. Functional assessment and re-education
- IX Yoga: Introduction, Historical background and Origin of Yoga, Meaning and Concept of Yoga and its relationship with Physical Education and Sports,**Yoga in Global Scenario:**, **Pranayama:** Meaning, Types and its importance. **Asanas:** Asanas- meaning, types, principles, Techniques of asanas and effects of asanas on various systems of the body - circulatory, respiratory and digestive system.
- X.Electro diagnosis: introduction to methods of electro diagnosis SD CURVE
- XI.Electro myography : technique of EMG , interpretation of normal and abnormal responses

XII.Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurement of NCV of nerves of upper limb and lower limb, interpretations of normal and abnormal responses.

XIII.Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP, SSR.

XIV.Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of:

- i. Superficial heating modalities
- ii. Deep heating modalities
- iii. Ultrasound
- iv. Cryotherapy

XV.Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of Physiotherapy

XVI. Low Frequency Current: Diadynamic Current, Iontophoresis

XVII.High Voltage, Pulsed Galvanic Stimulation , TENS, IFT, Russian Currents. LASER

XVIII. Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars, keloids, Muscle Plasticity & Integumentary Conditions.

IX. BIO-FEED BACK

Recommended books

1. James G. Hay – The Biomechanics of Sports Techniques, Prentice Hall.
2. Brunnstrom - Clinical Kinesiology, F.A. Davis.
3. Luttgens K., Hamilton N.: Kinesiology – Scientific Basis of Human Motion, Brown & Benchmark.
4. Kreighbaum E., Barthels K.: Biomechanics – A Qualitative approach for studying human Motion, MacMillan.
5. Rasch and Burk: Kinesiology and Applied Anatomy, Lee and Fabiger.
6. White and Punjabi - Biomechanics of Spine - Lippincott.
7. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis.
8. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders.

9. Northrip et al: Analysis of Sports Motion: Anatomic and Biomechanics perspectives,
W.C. Brown Co., IOWA.
10. Leveac B.F.: Basic Biomechanics in Sports and Orthopedic Therapy, C.V. Mosby.
11. De Boer & Groot: Biomechanics of Sports, CRL Press, Florida.
12. Basmajian - Muscle alive - Williams & Wilkins.
13. Nordin & Frankel - Basic Biomechanics of Muscular Skeletal System - Williams &
Wilkins.
14. Bartlett - Introduction to Sports biomechanics - F & FN Spon Madras.

2ND YEAR M.P.T

COURSE CODE -M.P.T-201

COURSE TITLE -EXERCISE PHYSIOLOGY

Subject description

Course outcomes

CO1: Comprehend the basic knowledge of sources of energy, aerobic and anaerobic synthesis of ATP along with the understanding of utilization of substrates in relation to the intensity and duration of exercise

CO2: Appreciate the measurement of energy cost of exercise and importance of energy transfer and energy expenditure at rest and during various physical activities

CO3: Understand the role of various macro and micro nutrients as well as their caloric requirements along with the basic classification, functions and utilization of nutrients.

CO4: Acquire about importance of diet for various competitions, nutrient supplements for performance and to design caloric requirements for various sports and age groups.

CO5: Critically evaluate the central and peripheral mechanism that regulates the cardiovascular and respiratory systems in exercise along with the physiological responses and adaptations of these systems to exercise and training.

CO6: Identify the regulation and significance of acid base balance following exercise

CO7: Understand the responses of various hormones with respect to exercise

SECTION -A

UNIT 1

- I. **Bioenergetics of exercise** : High energy phosphates, Anaerobic and aerobic ATP synthesis, Bioenergetics Control, exercise intensity & substrate utilization, protecting CHO stores, muscle adaptation to endurance training, processes that potentially limit the rate of fat oxidation, regulation of substrate utilization, training - induced increase in FFA oxidization:

- II. Basal metabolic and resting metabolic rates and factors affecting them, Classification of Physical Activities by energy expenditure,. Concept of MET , measurement of energy cost of exercise

- III. **Nutrition**
 - i. metabolism of Carbohydrate, fats, proteins , vitamin, mineral and water
- IV. **Nutrition in exercise**
 - ii. optimum nutrition for exercise , nutrition for physical performance , pre game meal
 - iii. carbohydrate loading , food for various athletic events , fluid and energy replacement in prolonged exercise

V. Respiratory responses to exercise: Ventilation at Rest and during Exercise, Ventilation and the Anaerobic Threshold, static and dynamic lung volume. Gas diffusion, Oxygen and carbon dioxide transport second wind, stich by side control of pulmonary ventilation during exercise adaptive changes in the respiratory systems due to regular physical activities.

VI. Cardiovascular responses to exercise- Cardiovascular system and exercise, acute vascular effects of exercise , Circulatory responses to various types of exercise regulation of cardiovascular system during exercise, Pattern of redistribution of blood flow during exercise, adaptive responses of cardiovascular system to aerobic and anaerobic training. Athlete heart

VII.Exercise and Acid Base Balance:

Acid and Bases, Buffers, pH, Respiratory Regulation of pH, Alkali Reserve, The kidneys and Acid base balance, Alkalosis and Acidosis, Acid base balance following heavy exercise.

VIII. Hormonal responses to exercise with respect to

Growth Hormone (GH), Thyroid and Para thyroid Hormones. Anti diuretic Hormone (ADH) and Aldosterone, Insulin and Glucagons, The catecholamine; epinephrine and norepinephrine. The sex hormones. The glucocorticoids (Cortisol) and Adreno Corticotrophic Hormones (ACTH). Prostaglandins and Endorphins:

SECTION -B

UNIT 2

I. Training and conditioning

Physiological basis of physical training , training principles , interval training , continues running concept of anaerobic threshold and vo2 max , physiological effects of various physical training methods,- aerobic and anaerobic training , strength training factors influencing training effects – intensity, frequency , duration , detraining, , process of recovery , post exercise oxygen consumption factors affecting recovery process , overtraining

II. Body temperature regulation during exercise

Mechanism of regulation of body temperature , Body temperature responses during exercise, Physiological responses to exercise in the heat , Acclimatization to exercise in the heat , Effects of age and gender on body temperature regulation during exercise, Physical activity and heat illness[heat exhaustion, dehydration exhaustion heat cramps & heat stroke] Prevention of Heat Disorders

III. Exercise in the Cold

Effects of exposure to cold and severe cold, Wind chill, Temperature receptors, Role of hypothalamus, shivering , Frost Bite and other problems, Clothing and Environment

IV. Exercise at Altitude

Exercise at altitude immediate physiological responses at high altitude, physiological basis of altitude training , phases of altitude training and specific training effects , altitude acclimatization , oxygen dissociation curve at altitude , disorders associated with altitude training

V. Exercise and body fluids

Measurement and regulation of body fluids, Body fluid responses and adaptations to exercise, Effects of dehydration and fluid replenishment on physiological responses to exercise and performance Fluid/carbohydrate replacement beverages

VI. Physical activity, body composition, energy balance and weight control

Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome , Healthy weight loss, Ways and methods of weight reduction , fluid maintenance, disordered eating, nutritional ergogenic aids , diet supplements in athletes and others involved in physical activity.

VII.. Exercise and Diabetes Mellitus

Exercise in insulin, requiring diabetes and non-insulin dependent diabetes mellitus, Effect of physical training on glucose tolerance and insulin sensitivity, Management of diabetes by diet and insulin

Books suggested

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. Lippincott Williams and Wilkins.
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill
3. Exercise Physiology: Powers, SK and Howley ET; Mc Graw Hill
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company
6. Komi, P. (Ed.) Strength and power in sport. Blackwell Scientific Publications.
7. Levick, J.R. An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann
8. McArdle, WD, Katch, FI & Katch, VL Exercise Physiology. Lippincott, Williams & Wilkins.
9. Shephard and Astrand Endurance in sport. Blackwell Scientific Publications.
10. Willmore, JH & Costill, DL Physiology of Sport and Exercise. 2nd ed. Human Kinetics.
11. Guyton, A.C. Textbook of Medical Physiology. Philadelphia: Saunders,
12. Nutrition for sport and exercise; Berning and Steen

Specialty papers

COURSE CODE -M.P.T-104, M.P.T 203, & M.P.T-204

SPECIALITY PAPER

Musculoskeletal physiotherapy

1.Clinical, Physical and Functional diagnosis in Musculoskeletal physiotherapy

10. Musculoskeletal physiotherapy

Recent advances in Musculoskeletal physiotherapy

COURSE CODE-M.P.T-104

COURSE TITLE

Clinical, Physical and Functional diagnosis in Musculoskeletal physiotherapy

Subject description

Course outcome

students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Orthopedics& interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Orthopedic Physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related Orthopedic conditions.

Unit 1 SECTION -A

ICF conceptual frame work

Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

Need and types of Documentation

Critical decision making and selection of outcome measures in Musculoskeletal Physiotherapy

Differential diagnosis in musculoskeletal conditions.

Functional assessment (Hand function, Gait, Posture, A.D.L, Occupational work)

Biomechanical and Patho-mechanical assessment of peripheral and spinal joints.

Principles of pathological investigations and Diagnostic imaging for diagnosis of orthopedic conditions with interpretation.

Clinical assessment and diagnosis of soft tissue disorders.

Unit 2 SECTION-B

Manual therapy – assessment and diagnosis of joint and soft tissue dysfunction.

Clinical examination of Muscle imbalances in orthopedic conditions.

Assessment and diagnosis of Developmental bone disorders.

Anthropometric measurements.

Physical fitness assessment by

a) Range of motion

b) Muscle strength, endurance and skills.

c) Body composition

d) Cardiac efficiency tests and spirometry

e) Fitness test for sports

Physical disability evaluation and disability diagnosis.

Gait analysis and diagnosis.

Coping Strategies in chronic painful musculoskeletal conditions.

Checkouts of orthotics and prosthetics for neuro-musculoskeletal problems.

Effect of Immobilization on Musculoskeletal System

Application of ICF in Musculoskeletal diagnosis

Medical screening for potential referred pain and Red Flags

SPECIALITY PAPER 2

COURSE CODE-203

2 Musculoskeletal/ orthopedic Physiotherapy

Subject description

Course outcome

students will be able to:

1. Develop a management plan, generally including some lifestyle factors, in co- operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients

Unit 1 SECTION -A

Advanced instruction in treatment and follow-up of the musculoskeletal system

Upper Quarter and Lower Quarter Muscle imbalances leading to dysfunction with corrective measures

Exercise planning and Exercise Prescription for musculoskeletal conditions

Management of pathological gaits and Postural deviations

Orthopaedic implants - designs, materials indications, post – operative physiotherapy

Manual therapy – Principles, indications, contraindications, and methods of application of joint mobilization techniques and soft tissue manipulations

Cumulative Traumatic Disorders and management

Aids and appliances, adaptive functional devices to improve neuro-musculoskeletal dysfunctions

Physiotherapy management of locomotor impairments, and disabilities at institutional & community levels

Taping techniques in orthopedic conditions

Sports injuries and their management

Unit 2 SECTION- B

Physiotherapy management in Fractures, Joint Instabilities, Soft Tissue Disorders, Deformities, Nerve Injuries, Metabolic, Hormonal Conditions, Neoplastic, Infective Conditions Of Bones and Joints of musculoskeletal system pertaining to upper quarter lower quarter and spine

Pre and Post surgical Rehabilitation of Joint replacement surgeries

Physiotherapy management after tendon transfer, Electrical stimulation and biofeedback procedures

Assessment and management of Paediatric and geriatric musculoskeletal disorders

Physical Agents and Electrotherapeutic management in orthopedic conditions.

Rehabilitation of congenital conditions and malformation of musculoskeletal disorders.

Physiotherapy management in Amputation and Prosthetic Prescription.

Equipment in orthopedic physiotherapy such as: Isokinetic, EMG and Biofeedback, Proprioception assessment equipments, Gait analyzers.

Home and self help programme in orthopedic physiotherapy.

Disability prevention and management

SPECIALITY PAPER 3

COURSE CODE-204

Recent advances and Evidence Based Practice in Orthopaedic Physiotherapy

Course out come

students will be able to:

Understand and apply the information regarding recent advances in Orthopedic Manual Therapy for patient care.

1. Search the evidences available for assessment and management of orthopedic conditions.
2. Apply the evidences available for the management of various orthopedic conditions.

Unit 1 SECTION A

Back School

Manual Therapy: Manual therapy: soft tissue manipulations and mobilization, neural mobilization, acupressure.(Cyriax, Maitland, Butler, McKenzie, Kaltenborn, Mulligan)

EBP and Recent advances in clinical assessment, laboratory investigations and diagnosis of musculoskeletal disorders.
EBP In Management of pain in musculoskeletal disorders.

Recent Advances in management of orthopedic conditions- medical, surgical and physiotherapy
Recent Advances in Physiotherapy management in arthritis and allied conditions.

Recent Advances and Controversies in Electrotherapy for orthopedic conditions.

Assessment and training for Core, postural stability and balance in musculoskeletal conditions

Recent advances in Kinematic & kinetic analysis.

Use of advance Assistive devices and technologies in musculoskeletal system

Current trends in sports injuries and management.

Evidence Based physiotherapy in management of metabolic and hormonal, neoplastic and infective conditions of bones and joints.

Unit 2 SECTION-B

Recent Advances in Physiotherapy following arthroplasty, implants and soft tissue repairs.

EBP and recent advances in physiotherapy after tendon transfer, Electrical stimulation and biofeedback procedures.

EBP in Rehabilitation of congenital conditions and malformation of musculoskeletal disorders.

Recent Advances in External aids, appliances, adaptive self-help devices; prescription, biomechanical compatibility, check- out and training.

EBP and Recent advances in electro diagnosis, Electromyography, NCV and evoked potential studies.

Community based rehabilitation in musculoskeletal disorders.

Recent Advances and Controversies in Orthopaedic physiotherapy.

Ergonomics assessment and management at work place.

Evidence Based Practice and Recent Advances of Manual Therapy in Musculoskeletal Conditions

Evidence based practice and recent advances of Aquatic therapy in Orthopaedic conditions

Suggested reading

- 1) Jones, M. A., & Rivett, D. A. Clinical reasoning for manual therapists. Edinburgh: Butterworth Heinemann.
- 2) Eyal Lederman - Fundamentals of manual therapy.
- 3) Grieve's Modern manual therapy
- 4) Walter Herzog - Clinical Biomechanics of spinal manipulation
- 5) Sandy Fritz, Kathleen Paholsky and M. Janes Grosenbach - Basic Science for soft tissue and movement therapies.
- 6) Jean Sayne Adams, Steve Wright - Theory and practice of therapeutic touch.
- 7) Akhoury Gourang Sinha – Principle and practice of therapeutic massage
- 8) Carol Manheim – The Myofascial release manual 3rd Edition
- 9) Maitland's – Peripheral manipulation
- 10) Maitland's – Vertebral manipulation
- 11) Chaitow – Cranial manipulation theory and practice
- 12) Lynn Paul Taylor – Taylor's manual of physical evaluation and treatment
- 13) Denise Deic – Positional release technique from a dynamic systems perspective.
- 14) Goodman and Snyder – Differential diagnosis in physical therapy
- 15) Tidy's Physiotherapy, Elsevier Publication.
- 16) Chaitow - Muscle energy technique
- 17) Reid et al – Sports injury assessment and rehabilitation.
- 18) Kjaer et al – Text book of sports medicine
- 19) Scudder Mc Can - Sports medicine, A comprehensive approach
- 20) Norris – Sports injuries, diagnosis and management for physiotherapists.
- 21) Werner Kuprian – Physical therapy for sports.
- 22) McGinnis – Biomechanics of sports and exercises.
- 23) Chew, F. Skeletal radiology: The bare bones. Baltimore, MD: Williams & Wilkins.
- 24) Eisenberg, R. L., & Johnson, N. M. Comprehensive radiographic pathology St Louis, MO: Mosby.
- 25) Hughes, J., & Hughes, M.. Imaging: Picture tests. Edinburgh: Churchill Livingstone.
- 26) Mace, J. D., & Kowalczyk, N. Radiographic pathology for technologists. St Louis, MO: Mosby.
- 27) Redhead, D. N. Imaging: Colour guide. Edinburgh: Churchill Livingstone.
- 28) Yochum, T. R., & Rowe, L. R. Yochum and Rowe's essentials of skeletal radiology. Baltimore, MD: Lippincott Williams & Wilkins.
- 29) Gunn, C. Bones and joints: A guide for students. London: Churchill Livingstone.
- 30) Haines, D. E. Fundamental neuroscience W. B. Saunders Co.
- 31) Kandel, E. R., Schwartz, J. H., & Jessell, T. M. Principles of neural science McGraw-Hill.
- 32) Longmore, J., Wilkinson, I., & Rajagopalan, S. Oxford handbook of clinical medicine Oxford: OUP.
- 33) Newman Dorland, W. A. Dorland's illustrated medical dictionary W. B. Saunders Co.

- 34) Nolte, J. The human brain: An introduction to its functional anatomy. St Louis, MO: Mosby.
- 35) Nolte, J., & Angevine, Jr. J. B. The human brain in photographs and diagrams. St Louis, Mosby.
- 36) Wicke, L. Atlas of radiologic anatomy, Munich, Germany: Lea &Febiger.
- 37) Seidel, H. Mosby's guide to physical examination. St Louis, MO: C.V. Mosby.
- 38) Cailliet, R. Neck and arm pain Philadelphia: FA Davis.
- 39) Cailliet, R. Shoulder pain Philadelphia: FA Davis.
- 40) Cailliet, R. Knee pain and disability Philadelphia: FA Davis.
- 41) Cailliet, R. Hand pain and impairment Philadelphia: FA Davis.
- 42) Cailliet, R. Low back pain syndrome Philadelphia: FA Davis.
- 43) Cailliet, R. Soft tissue pain and disability Philadelphia: FA Davis.
- 44) Chaitow, L. Cranial manipulation: Theory and practice Edinburgh: Churchill Livingstone.
- 45) Greenman, P. E. Principles of manual medicine. Philadelphia: Lippincott Williams & Wilkins.
- 46) Wilson, A. Effective management of musculoskeletal injury: A clinical ergonomics approach to prevention. Churchill Livingstone.
- 47) O'Sullivan, F.A. Davis, Philadelphia. Physical rehabilitation: assessment and treatment.
- 48) Victor H. Frankel and Mangareta Nordin Basic Biomechanics of the Musculoskeletal system 2nd Edition
- 49) Essentials of Orthopedics for physiotherapists by John Ebenezer – Jaypee Publications
- 50) Practical Fracture Treatment by Ronald Mc Rae, Max Esser – Churchill Livingstone
- 51) Oxford Textbook of Orthopedics & Trauma – Christopher Bulstrode, Joseph Buckwalter, Oxford University Press
- 52) Fractures & Joint Injuries – By Watson Jones – Churchill Livingstone
- 53) Measurement in Physical Therapy – Churchill Livingstone, London
- 54) Soft Tissue Pain & Disability – Cailliet Rene, Jaypee Brothers, New Delhi
- 55) Physical therapy of the low back –Twomey, Churchill, Livingstone, London
- 56) Clinical Orthopaedic Examination by Ronald McRae – Churchill Livingstone
- 57) Campbell's operative orthopedics – By S. Terry Can ale, James H. Beaty – Mosby
- 58) Orthopedic Physical Assessment, By David J. Magee – Saunders
- 59) Diagnostic Imaging for Physical Therapists – by James Swain, Kenneth W. Bush & Juliette Brosing – Elsevier
- 60) Differential Diagnosis For Physical Therapists: Screening for Referral – by Catherine C. Goodman & Teresa Kelly Snyder – Saunders

- 61) Lynn Paul Taylor – Taylor's manual of physical evaluation and treatment
- 62) Goodman and Snyder – Differential diagnosis in physical therapy.
- 63) Leon Chaitow, and Judith Walker Delany - Clinical application on neuromuscular techniques: Vol-2 (The lower body)

2. Neurological physiotherapy

Clinical, Physical and Functional diagnosis in Neuro-physiotherapy Neuro-physiotherapy

Recent advances in the specialty

SPECIALITY PAPER ONE

COURSE CODE-MPT-104

1. Clinical, Physical and Functional diagnosis in Neuro-physiotherapy

Course description

Course outcome

On successful completion of this unit, it is expected that students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Neurology medicine & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary physical diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Neurological physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related neurology conditions.

SECTION- A

Unit 1

1. ICF conceptual frame work
- 2.Importance of assessment & evaluation, Outlines of principles and Methods of evaluation
- 3.Need and types of Documentation
- 4.Critical decision making and selection of outcome measures in Musculoskeletal Physiotherapy
- 5.Assessment, differential diagnosis and diagnosis of various Neurology conditions
- 6.Associated functional disturbances of higher function and their testing
7. Outcome measures used in Neuro-physiotherapy-for Cognitive impairment and disability, Focal disabilities, Global measures of disability, Motor impairment, ADL and extended ADL tests, Handicap and quality of life, Multiple Sclerosis, Parkinson's disease, Stroke, Head injury, Spinal cord injury, Pain scales
8. Clinical analysis of posture, movement and gait, use of gait analyzer
9. Principles, Techniques and interpretation of Pathological investigations and diagnostic imaging (CT, MRI, Ultra sound, PET, fMRI, bone scan and other diagnostic imaging) for diagnosis of neurological conditions.
10. Clinical examination and detection of movement dysfunction
11. Evaluation of ANS dysfunction with reference to Psycho physiological testing
12. Motor control assessment, reflexes and automatic reactions
13. Neurodevelopment assessment

SECTION- B

14. Assessment of Hand Function

15. Voluntary control assessment

16. Neuropsychological tests

17. Electrophysiological assessment devices – Instrumentation, Characteristics and components EMG (Qualitative and Quantitative EMG), NCV, Conventional Methods, RNS, EPS, EEG related to neurological disorders with interpretation.

18. Physical disability evaluation and disability diagnosis

19. Assessment of progressive locomotor disorder- Neuropathic, myopathic and NMJ conditions

20. Assessment and scales for diagnosis of pain

21. Biomarkers specific to neurological disorders

22.. Assessment of Emotional Intelligence

23. Assessment of Peripheral nerve injuries and Cranial nerve disorders.

24. Neurophysiology and evaluation of Balance and Coordination

25. Assessment of Physical and Neurological Functions of Patients in ICU.

SPECIALITY PAPER TWO

COURSE CODE: MPT-203

2. Neurological Physiotherapy

Course outcome

students will be able to:

1. Develop a management plan, generally including some lifestyle factors, in co- operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

SECTION- A

Unit 1

1. History of neurological physiotherapy, Epidemiology, classification of Neurology disorders, ICF classification of Neurological Disorders, symptomatology, patho-physiology and management of Neurological Disorders.
2. Physiotherapy interventions of various disorders of Central Motor control
3. Physiotherapy interventions of various disorders of the Motor Unit – Neuropathies, Myopathies and Neuromuscular junction Disorders.
4. Physiotherapy interventions for Autonomic Nervous system dysfunction
5. Physiotherapy intervention for Peripheral Nervous system conditions (injuries and lesions)
6. Physiotherapy interventions for Tonal abnormalities.

7. Physiotherapy intervention for Traumatic conditions of CNS
8. Physiotherapy management for Demyelinating, Inflammatory, Infectious and Degenerative conditions.
9. Physiotherapy management for CNS Neoplasia.
10. Metabolic and Deficiency Disorders and their management
11. Congenital Neurological Disorders and management
12. Disorders of Perception & Cognition & their Rehabilitation,
13. Sensory System Dysfunction and rehabilitation
14. Oromotor Dysfunctions and Management
- 15 Visual Deficits and its management

SECTION- B

Unit 2

16. Vestibular Dysfunction and its rehabilitation
17. Psychosomatic conditions and management.
18. Neuro - Surgical conditions and its postoperative management.
19. Neuro-Physiotherapy management in Intensive Care Units (ICU).
20. Physiotherapy interventions for muscle imbalances and corrective measures. Musculo-skeletal and Neurological complications of Locomotor Disorders
21. Pain Management
22. Adaptive and Assistive Functional Devices and technologies to improve neurological dysfunction.
23. Management of Bladder and Bowel Dysfunction
24. Neuro-physiotherapeutic approaches – Compensatory training approach, Muscle reeducation approach, Novel Approach, Neuro-physiological approaches - NDT, Brunnstrom, Roods, PNF, Sensory integration therapy . Motor relearning program, Constraint Induced movement therapy, Task Oriented approach, Novel approach, Vojta therapy. Biofeedback training, Neural mobilization and Neuro Dynamics, Sensory rehabilitation, Body Weight Supported Treadmill Training, Myofacial Release Technique, Inhibitory and Facilitation technique, Functional Re-Education, Learning skills, A.D.L, Tapping in neurological conditions.
25. FES, NMES, Biofeedback, Various equipment used in Neuro-physiotherapy
26. Problem Based Learning clinical conditions in Neurology physiotherapy.
27. Pharmacology in Neurophysiotherapy.
28. Training of Emotional Intelligence.
29. Hydrotherapy for Neurological conditions.
30. Palliative Care Approach.
31. Physiotherapy Management of Cerebellar Disorders.

SPECIALITY PAPER -THREE

COURSE CODE: MPT-204

Recent advances and Evidence Based Practice in Neuro-physiotherapy

Course outcome

students will be able to-

1. Understand and apply the information regarding recent advances in Neuro physiotherapy for patient care.
2. Search the evidences available for assessment and management of neurological conditions.
3. Apply the evidences available for the management of various neurological conditions

SECTION- A

Unit 1

1. Genetic counseling, Stem cell therapy, Gene therapy
2. Recent advances in Pain Modulation and Rehabilitation.
3. Recent advances in Vocational Rehabilitation in Neurology Disorders with disability
4. Recent advancement in Neurology Orthosis – prescription and training.
5. Psychiatry problems in Neurological conditions and physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of neurological disabilities
6. Institutional & community based rehabilitation for Neurological Dysfunction.
7. Recent Neuro Physiotherapy technique - Mental Imagery technique, Virtual Reality Therapy/Virtual Clinic, Robotic Movement Therapy, Pilates therapy, Mirror Box therapy, Mime therapy, Floatation Therapy, Cupping Therapy, Jadestone Therapy, Matrix Rhythm Therapy, IASTM and Dry needling, Cranio-Sacral therapy, Neurodynamics in Neurological conditions and Neural Mobilization, Hippo-therapy, Transcranial Direct Current Stimulation, Transcranial Magnetic Stimulation, Artificial Intelligence, Whole Body Vibrator and Neuromuscular Technique
8. Eclectic Approach

SECTION- B

Unit 2

9. History of Evidence Based Practice in Neurological physiotherapy, Clinical Decision Making, importance of Evidence Based Practice, Evidence about prognosis, experience and diagnosis, locating evidences, challenges and barriers in EBP.

10. Evidences in interventions for Neurological Impairments (Sensory, Motor, Cognitive and Perceptual)
11. Evidences for physiotherapy in Traumatic CNS conditions
12. Evidences in physiotherapy management of Stroke, Cerebellar Ataxia.
13. Evidences in physiotherapy management of Peripheral Nerve Injuries
14. Evidences in physiotherapy management of Parkinson's Disease
15. Evidences in physiotherapy management of Myopathies, Neuropathies and NMJ Disorders
16. Sports training in Neurological Physiotherapy.
17. Tele rehabilitation in Neurological Physiotherapy

Books

For paper III, IV, V.

1. American Psychological Association. Publication manual of the American Psychological Association. Washington, DC: Author.
2. Chichester, UK: John Wiley. Domholdt, E. Physical therapy research: Principles and applications, WB Saunders, Philadelphia, USA.
3. Kuzma, J. W., & Bohnenblust, S. E. Basic statistics for the health sciences. Boston: McGraw Hill.
4. Munro, B. H. Statistical methods for health care research. Philadelphia: Lippincott.
5. Coakes, S. J., & Steed, L. G. SPSS: Analysis without anguish: Version 11.0 for Windows. Milton, Australia: John Wiley & Sons Inc. Jenkins, S., Price CJ, & Straker L.
6. The researching therapist. A practical guide to planning, performing and communicating research. Edinburgh: Churchill Livingstone.
7. Campbell, M.J., & Machin, D. Medical statistics: A commonsense approach . Chichester, UK: John Wiley.
8. Domholdt, E. Physical therapy research: Principles and applications. Philadelphia: WB Saunders.
9. Gowitzke, Williams and Wilkins. Scientific Basis of Human Movement . Baltimore..
10. Handbook of Physiology in Aging- Masoro, C.R.C. Press.
11. Hicks C: Research of Physiotherapists. Churchill Living stone, Edingburgh
12. Polgar S.: Introduction to Research in Health Sciences. Livingstone London.
13. Currier D.P: Elements of Research Physical Therapy. Williams & Wilkins, Baltimore.
14. Sproull: Hand Book of Research method. Scarecrow Press
15. Wilenski, Hale & Iremonger: Public Power and Administration.
16. Hickik Robert J: Physical Therapy Administration and management.
17. Nosse Lorry J: Management Principles for Physiotherapists.
18. Carpenter M.B: Human Neuroanatomy. Williams & Wilkins, Baltimore, n
19. Fraser: Physical Management of Multiple Handicapped. William & Wilkins, Baltimore
20. Aisen: Orthotics in neurological rehabilitation. Demos Publication, New York
21. Delisa: Manual of nerve conduction velocity techniques. Raven press, New York,
22. Kimura J, F.A Davis: Electrodiagnosis in diseases of nerve and muscle. Philadelphia ,
23. O' Sullivan, F. A Davis: Physical rehabilitation: Assessment and treatment. Philadelphia ,
24. Farber: Neuro – rehabilitation. W.B. Saimders , Philadelphia
25. Kerb D: Bio- Feedback – A practitioners guide. Guiford press.
26. Black I: The neural basis of motor control. Churchill, Livingstone , London -
27. Turnbull Gerode I: Physical therapy management of Parkinson's disease. Churchill , Livingstone , London -
28. Bobath B: Abnormal postural reflex activity caused by Brain Lesions. Aspen publications, Rockville
29. Eigel: Disorders of Voluntary Muscle. Churchill, Living stone Edingburgh
30. Knot M. and Voss: Proprioception, neuro muscular facilitation techniques. Harper and Row , New York

31. Laidler, Capman and Hall: Stroke rehabilitation. London
32. Carr J.H, Shephered R.B: Motor relearning programme for stroke. Aspen publication, Rock Ville,
33. Bobath B. Heinmann: Adult hemiplegia evaluation and treatment: London
34. Brombley: Paraplegia and tetraplegia. Churchill, Livingstone, Edingburgh
35. Measurement in Physical therapy – Churchill, Livingstone, London
36. Maria stokes: Physical management neurological rehabilitation, Elsevier, Mosby.
37. Misra U.K, Kalita J: Clinical Neurophysiology NCV, EMG, Evoked Potentials, Elsevier, New Delhi,
38. Joel A Delisa, Gans B.M: Rehabilitation medicine principles and practice, revan, Philadelphia, New York,
39. Robert Gunzbnng, MarekSzpalski: Whiplash Injuries, current concepts in prevention diagnosis and treatment, Lippincot Williams & wilkins.
40. Krusen's: Hand book of physical rehabilitation, kottke, lehmann, Saunder's Publications,
41. Ropper A.H, Brown R.H: Adam and victors principle of neurology, Mcgraw – hill companies USA
42. Richard S. Snell: Clinical Neuroanatomy for medical students, Lippincott Williams & wilkins
43. Martha Freeman Somers: Spinal cord injury functional rehabilitation
44. David S Butler: Mobilisation of the nervous system Churchill Livingstone, New York.
45. Darcy A. Umphred: Neurological rehabilitation, Mosby, Sydney,
46. Kenneth W. Lindsay, Ian Bone: Neurology & Neurosurgery illustrated,
47. M Flint Beal, Anthony.E. Lang, Albert Ludolph: Neurodegenerative Diseases, Cambridge University Publication, USA
48. Jose .I. Suarez :Critical Care Neurology and Neurosurgery, HUMANA PRESS PUBLICATIONS, USA.
49. David .R. Lynch: Neurogenetics-Scientific& Clinical Advances, Taylor& Francis Group Publication New York
50. Asbury, Mckann, Medonald: Diseases of Nervous System- Vol .I and Vol II, Mearthur public, 3rd edition.

3. Cardio- Respiratory physiotherapy

1. Clinical, Physical and Functional diagnosis in Cardio- Pulmonary Physiotherapy

2. Cardio- Pulmonary Physiotherapy

3 Recent advances in Cardio- Pulmonary Physiotherapy

SPECIALITY PAPER ONE

COURSE CODE: MPT-104

1. Clinical, Physical and Functional diagnosis in Cardio- Pulmonary Physiotherapy

Course outcome

students will be able to:

1. Elicit and interpret clinical signs and symptoms of cardio-vascular and pulmonary diseases & interpret clinical tests and special investigations commonly used in the diagnosis of conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images in various cardio-vascular and pulmonary disorders

SECTION- A

UNIT 1

ICF conceptual frame work

Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

Need and types of Documentation

Critical decision making and selection of outcome measures in cardiopulmonary Physiotherapy

1. GENERAL:

- Review of Anatomy, Embryology and Epidemiology of cardio-vascular, pulmonary and lymphatic pulmonary system.

- Role of cardio respiratory therapist in patient assessment.
- Patient clinician interaction and communication with assessment findings.
- Confidentiality, concern and universal precautions.
- A detailed and comprehensive cardio-respiratory health history.
- Assessment standards, common scales, questionnaire indices used for patients with cardio-pulmonary dysfunction.

2. Detailed assessment of cardio-vascular and pulmonary symptoms (dyspnea, cough, sputum production, hemoptysis, clubbing, cyanosis, chest pain, syncope, fever, night sweating, headaches, altered sensorium, personality changes, snoring).

3. Vital signs assessment

1. Obtaining vital signs, clinical impressions
2. General clinical presentation
3. Temperature
4. Pulse including the peripheral pulses
5. Blood pressure
6. Respiratory rate

4. Fundamentals of physical examination with diagnosis in cardiovascular and respiratory physiotherapy

1. Examination of head and neck
2. Lung topography – thoracic cage landmarks
3. Examination of Thorax/ pulmonary system
4. Examination of Precordium/cardiac system
5. Examination of Abdomen
6. Examination of Extremities

5. Assessment of neonatal and pediatrics patients – new born, critically ill infants, older infants and child

6. Comprehensive geriatric assessment – age related sensory deficits, cardio- respiratory deficits and diagnostic tests, standard scales and questionnaires used in geriatric assessment

7. Nutritional assessment of patients with cardio- respiratory diseases

8. Fitness assessment

1. Anthropometric and biophysical measurement and body composition
2. Flexibility tests and standards
3. Muscle strength and standard
4. Endurance tests and standards
5. Agility tests and coordination tests

9. Exercise testing and standardization and interpretation

1. TMT protocols- Maximal and submaximal protocols
2. Field protocols₄₅₈
3. Bicycle protocols

4. Step test protocols

5. 6, 9 and 12 minute walk tests

6. Protocols for pediatric and geriatric population

10. Investigation and their interpretation and clinical relevance in cardio- pulmonary physiotherapy

I. Clinical laboratory studies – hematology, microbiology, urine analysis, histology, pathology

II. Pulmonary function tests – normal values

a. Spirometry, arterial blood gas analysis and its interpretation in cardio – respiratory physiotherapy, capnography and pulse oximetry and its relevance in cardio- pulmonary physiotherapy

III Clinical application of chest radiograph – chest x-ray, examination, views; computed tomography, magnetic resonance imaging, lung scans - PET scan.
Evaluation of chest radiography – clinical and radiographic findings in cardio- pulmonary disorders and its relevance cardio-pulmonary physiotherapy

IV. Laboratory and bedside interpretation of ECG findings – interpretation of normal and abnormal ECGs and its importance in cardio-respiratory physiotherapy and various ECG patterns in cardiac and lung disease

V. Cardio respiratory monitoring in critically ill patients including patients with artificial airways

1. Ventilator assessment and evaluation of oxygenation in ICU

2. Assessment of cardiac output in ICU

3. Assessment of haemodynamic pressures in ICU

4. Clinical diagnosis in cardio- respiratory disorders in intensive care

SECTION- B

UNIT 2

VI. Blood flow studies-arteriography, venography, Color Doppler, ANS testing and interpretation used in cardio- respiratory physiotherapy and edema evaluation and interpretation.

VII. Cardio respiratory assessment and diagnosis of patient on mechanical ventilator and interpretation of graphical forms, weaning modes and indices

VIII. Risk factor stratification, disability evaluation with reference to cardio vascular and pulmonary disorders

IX. Psychological evaluation with reference to stress and anxiety in cardio- pulmonary disorders, Evaluation of stress and anxiety using various scales and questionnaires

X. Outcome measures used in Cardio – vascular and pulmonary physiotherapy

XI. . Cardio-pulmonary Exercise Testing, VO₂ max, METs – its importance in calculating energy expenditure and physical activities

XI. calculating energy expenditure using calorimetry method, various formulae and equations with emphasis on its importance in prescribing exercise in various patient population

XII Evaluation and diagnosis of sleep and breathing disorders

SPECIALITY PAPER TWO

COURSE CODE: MPT-203

2.Cardio-vascular and pulmonary physiotherapy

students will be able to:

1. Develop a management plan, generally including some lifestyle factors, in co- operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

SECTION- A

A. Principles of exercise prescription and exercise program adherence.

1. Components of physical fitness and Basic principles of exercise program design.
2. The art of science of exercise prescription in various patient population
3. Bioenergetics of exercise and training
4. Warm ups, stretching and cool down and its importance

5. Exercise program adherence and factors affecting exercise adherence.
6. Different forms of training methods.

B.

1. Designing cardio-respiratory exercise programs for cardiac and pulmonary patients, geriatric and general population. Essentials of a C.R. exercise work-out, Aerobic training. Methods and modes, personalized programs.
2. Designing Resistance exercise programs.
 - Types of resistance training and developing respiratory exercise program including calisthenics.
 - Resistance exercise program for children and older adults.
3. Designing flexibility and stretching programs.
4. Designing weight management (weight loss and weight gain) and

Body composition programs.

5. Application of exercise prescription principles in various cardio-pulmonary disorders including edema management

C.

1. Nutrition and cardio-vascular and pulmonary diseases including diabetic population- Role of carbohydrates, proteins, fats, vitamins in health and disease.
2. Diet prescription in diabetic, hypertensive, cardio-metabolic syndromes, obesity and cancer patients according to calorie expenditure.
3. Exercise prescription/ physical activity in a high risk cardiac patient including L.V Dysfunction, chronic heart failure, myocardial ischemia.
4. Exercise prescription in prevention of CAD, obesity, renal dysfunction, diabetes mellitus, hypertension.

2. CARDIO-VASCULAR DISORDERS AND PHYSIOTHERAPY MANAGEMENT INCLUDING EXERCISE PRESCRIPTION IN:

- Myocardial infarction
- Acquired heart conditions
- Hypertension, hypotension
- Rheumatic fever, rheumatic heart disease and non- rheumatic valvular diseases.
- Diseases of myocardium ,pericardial diseases, cardiomyopathies

- Vascular diseases, peripheral vascular diseases and lymphatic diseases
- Tumors of heart
- Athlete heart
- Congestive cardiac failure
- Cardiac arrhythmias
- Congenital heart diseases
- Cardiac transplantation

SECTION- B

3. PULMONARY DISORDERS AND PHYSIOTHERAPY MANAGEMENT INCLUDING EXERCISE PRESCRIPTION IN:

- Obstructive pulmonary diseases
- Restrictive pulmonary diseases
- Infective lung diseases
- Occupational lung diseases
- Lung cancer
- Chest wall deformities and spinal cord injury
- Diaphragmatic diseases
- Sleep apnea/ hyperventilation syndrome
- Respiratory disorders in children, cystic fibrosis
- COVID-19

4. Common emergency conditions in cardio-respiratory system in adults and children and ethical issues in intensive care

5. Management of Pediatric and geriatric Cardiac and pulmonary disorders

6. Burns rehabilitation in Critical Care unit
7. Cardio-pulmonary problems and complications in various neuromuscular disorders, facilitatory and inhibitory techniques and PNF techniques in various pulmonary disorders, manual techniques for various pulmonary disorders.
8. Physical agents used in various cardio-vascular and respiratory disorders
9. Cardio-vascular and pulmonary pharmacology- Indications, contraindications and effects and pharmacological management in cardiac and pulmonary disorders.
10. Body positioning: art and its physiological importance in general and in ICUs
11. Aerosol therapy- Principles and its role in physiotherapy.
12. Humidifiers and Atomizers role in physiotherapy.
13. Stress, Importance of exercise in stress management and various stress coping strategies, relaxation techniques including yogic postures and yogic breathing in various lifestyle disorders and other cardio-vascular and pulmonary conditions
14. Importance of Patient education and counseling in various cardio-vascular and pulmonary disorders in cardio- respiratory conditions, CBR in cardio vascular and respiratory conditions
15. Role of Tele-rehabilitation in cardiac and pulmonary disorders
16. Clinical decision making in Cardiovascular and pulmonary physiotherapy

SPECIALITY PAPER THREE

COURSE CODE: MPT-204

Recent advances and Evidence Based Practice in Cardio-vascular and pulmonary physiotherapy

Students will be able to-

1. Understand and apply the information regarding recent advances in cardio-pulmonary physiotherapy for patient care.
2. Search the evidences available for assessment and management of cardiopulmonary conditions.
3. Apply the evidences available for the management of various cardio-pulmonary conditions

SECTION- A

1. GENERAL:

- Optimizing treatment prescription: relating treatment to the underlying pathophysiology of cardio-vascular and pulmonary disorders- an evidence based practice
 - Documentation of the data, Report writing –prescription of exercises
 - Importance of creating awareness in community, Patient education and psychological counseling in various cardio-vascular and pulmonary disorders- evidence based practice
 - Recent advancement in Cardio- pulmonary resuscitation (basic and advanced)
2. Bronchial hygiene- Physiological basis and clinical application, evidence based practice and recent advances of airway clearance techniques, including Facilitating airway clearance with coughing techniques.
3. Care of a dying patient. – Ethical issues and recent guidelines
4. Cardiopulmonary training in various patient populations. Athletes, Geriatric and pediatric population
5. Medical gas therapy including oxygen therapy: physiological basis, modes of administration, and home delivery care- an evidence based practice and recent advances including hyperbaric oxygen therapy.
6. Aerosol therapy- An Evidence based practice in chest physiotherapy.

SECTION- B

7. Recent advances and evidence based practice in Exercise testing, planning, principles of exercise prescription and PT management in cardio- vascular and pulmonary conditions.
8. Recent advances and evidence base practice in cardio-respiratory physiotherapy and exercise prescription in special populations like cancer, renal conditions, burns, abdominal surgeries, Neurological patients and Diabetic mellitus patients.
9. Recent advances in the use of physical agents and PT management in wounds, ulcers, grafts and incisions and vascular disorders.
10. Evidence based practice of core muscle strengthening, resistance training, endurance training, and other training methods in cardiac and pulmonary rehabilitation

11. Pilates- school of thought for cardiopulmonary conditions.
12. Physiotherapy management in oncology- Evidence based practice and recent advances.
13. Recent advances and evidence based practice in Respiratory physiotherapy training techniques and respiratory physiotherapy devices.
14. Evidence based practice and recent advances in improving Cardio-respiratory fitness training in all populations including general, pediatric and geriatric population.
15. Evidence based practice and Recent guidelines in cardiac rehabilitation and pulmonary rehabilitation
16. Role of exercise and quality of life and cardio-pulmonary rehabilitation, health status measurements and recent advances
17. Use of advance Assistive devices like Robot therapy, continuous lateral rotation therapy, intrapulmonary percussive ventilator and technologies in Cardiovascular and pulmonary system.
18. Evidence based practice and recent advances of Aquatic therapy in Cardiovascular conditions like diabetes, PVD, hypertension etc.

BOOKS

1. Froelicher /Myers-"Exercise and heart' Saunders publication.
2. Jean Jobin et al. Advances in Cardio-Pulmonary Rehabilitation"
3. Scot Irvin,Lan Stiphen Tecklin-"Cardio-Pulmonary physical therapy-a guide to practice", Mosby .
4. Frances J Brannon,Margaret W Foley,Julie Ann Stars,Lauren M Saul
"Cardio-Pulmonary Rehabilitation-Basic Theory and Application",F A Davis Company.
5. Cynthia Coffin Zadai-"Pulmonary management in Physical therapy",Churchill Livingstone.
6. Barbara A Webber and Jennifer A Pryor-"Physiotherapy for respiratory and cardiac problems", Churchill Livingstone.
7. George G.Burton,John E Hodgkin,Jeffrey J Ward-"Respiratory Care-A Guide to Clinical Practice" 4th edition, Lippincott Williams and Wilkins,
8. Robert M Berne, Matthew N Levy-"Cardio-vascular physiology", Mosby.
9. John B.West-"Respiratory Physiology-the essentials", Lippincott Williams and Wilkins.
10. Macleod's Clinical Examination.
11. Andrews Davies and Carl Moores-"The Respiratory System", illustrated by Robert Britton, Churchill Livingstone.
12. George G.Burton,John E Hodgkin,Jeffrey J Ward-"Respiratory Care-A Guide to Clinical Practice", Lippincott Williams and Wilkins,
13. Richard d Branson/Robert L Chatburn-"Respiratory Care Equipment",J B Lippincott Company.
14. N R Malentyre/R D Branson-"Mechanical Ventilation",Saunders.
- 15.Joanne Watchie-"Cardio-Pulmonary Physical Therapy",Saunders.
16. Hillegass and Sadowsky."Essentials of Cardio-Pulmonayr Physical Therapy",Saunders,Elseviers.
17. Michael L.Pollock and Donald H Schmidt-"Heart disease and Rehabilitation".
18. Scot Irvin, Lan Stiphen Tecklin."Cardio-Pulmonary physical therapy-a guide to practice", Mosby.
19. Frances J Brannon, Margaret W Foley, Julie Ann Stars, Lauren M Saul
- 20.Cardio-Pulmonary Rehabilitation-Basic Theory and Application". F A Davis Company

Sports physiotherapy

1.SPORTS TRAUMATOLOGY

2 CONCEPTS IN SPORTS MEDICINE

3 Recent advances in_Sports physiotherapy

SPECIALITY PAPER - ONE

COURSE CODE: MPT-104

1. SPORTS TRAUMATOLOGY

SECTION- A

ICF conceptual frame work

Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

Need and types of Documentation

Critical decision making and selection of outcome measures in SPORTS Physiotherapy

Investigative Procedures. Diagnostic imaging (CT, MRI, Ultra sound, bone scan and other diagnostic imaging's) for diagnosis of congenital anomalies and normal variants, traumatic injuries, scoliosis, degenerative disorders and infections)

Principles of pathological investigations and imaging techniques related to musculoskeletal disorders with interpretation Causes & Mechanism of Sports Injuries

1. Components of pre-participation evaluation Scope and implementation of pre-participation program
2. Evaluation of Physical Fitness
- 3 Assessment of components of physical fitness including functional tests: muscle strength, flexibility, agility, balance, co-ordination, sensory deficits, cardio-pulmonary endurance
4. Sports-Specific evaluation and criteria for return to sport
5. Examination of lower limb Pelvis
 - i.Hip
 - ii.Thigh
 - iii.Knee
 - iv.Leg
 - v.Ankle and Foot
 - vi.Examination of Upper Extremity
 - vii.Shoulder girdle
 - viii.Shoulder
 - ix.Arm
 - x.Elbow &Forearm
 - xi.Wrist and hand.
6. Assessment of vertebral column:
 1. Cervical
 2. Thoracic
7. Lumboscaral including Tests of Neural Tension
8. Sporting emergencies screening
 - a. Head and neck
 - b. Face
 - c. Abdominal injuries
- 9 Anthropometric evaluation
10. Kinesiological EMG

Unit 2.

11. Causes & Mechanism of Sports Injuries
12. Prevention of Sports injuries
13. Principle of management of sports injuries
14. Common acute and overuse injuries of lower Extremity (with respect to causation, prevention and management) of:
 - I Pelvis
 - II Hip
 - III Thigh
 - IV Knee
 - V Leg
 - VI Ankle and Foot
15. Common acute and overuse injuries of upper extremities (with respect to causation, prevention and management) of:
 - i. Shoulder girdle
 - ii. Shoulder
 - iii. Arm
 - iv. Elbow & Forearm
 - v. Wrist and hand.
16. Common sports injuries of spine with respect to causation, prevention and management
17. Sporting emergencies & first aid
 - a. Head and neck
 - b. Face
 - c. Abdominal injuries
18. Emergency Medical Planning and Cover For Sports Events
19. Emergency Situations, Primary and secondary emergency assessment, emergency plan, Transportation of an injured person
20. Treatment of collapsed athlete- Severe head injury, Athlete with spinal injury,
21. Causes of Collapse, hypothermia
22. Sports specific injuries, with special emphasis on the specific risk factor, nature of Sports,

Biomechanical Analysis of Skills, kind of medical intervention anticipated and prevention with respect to various sporting events

1. Individual events: Field & Track
2. Team events: Hockey, Cricket, and Football
3. Contact and Non-contact sports
4. Water sports

2. CONCEPTS IN SPORTS MEDICINE

SECTION- A

Unit 1

Sports Training Parameters and Methods

1. Training Load, Adaptation and Recovery: Relationship of load and recovery, physiotherapeutic and psychological means of Recovery, Variables of Training: Volume, Intensity, Density, Complexity.
2. Relationship between volume and intensity
3. Fatigue and overtraining: Diagnosis, Monitoring and preventing overtraining. RECOVERY METHODS
4. Training Methods: Interval training, Continuous training, Circuit training, Fartlek training, Weight training, Plyometric method, Cross training
5. Bio Motor Abilities And Program Design
6. Anaerobic Exercise Training & Prescription: Prerequisites, types and Factors affecting the training variables: Strength Development, Plyometric Training, Speed, Agility and Speed Endurance Development
- 7.. Aerobic Exercise Training & Prescription: Prerequisites, types and Factors affecting the training variables
8. Coordination Training: Definition, Classification of coordinative abilities, factors affecting coordination and Methods to develop coordination

Sports Psychology-Role of Sports Psychology in Sports performance, Factors affecting growth and development & role of heredity & environment
Biofeedback, Mental coping strategies, Visual Imagery, Meditation History and current status of Sports Psychology

- Personality assessment and sports personality · Attention and perception in sports
- Concentration training in sports · Motivational orientation in sports
- Pre-competitive anxiety · Relaxation training · Aggression in sports · Role of Psychology in dealing with injuries · Eating disorders · Goal setting (Psychological aspect of doping, stress management, group behaviour and leadership, emotion

DISABILITY SPORTS

Sports Massage

Doping in athletes

SECTION- B

Unit 2.

NON TRAUMATIC CONDITIONS OF ATHLETES Illness Hypertension Urine abnormalities Exercise Induced Asthma Anemia Delayed onset muscle soreness (DOMS) Runner's high & Exercise addiction. G.I.T. Diseases

SPORTS FOR DISEASED ;Exercises and congestive heart failure Exercise for Post coronary & bye pass patients Exercise for diabetics

Diagnosis and management of skin conditions of Athletes Bacterial infections Fungal Infections Viral infections Boils Cellulites.

- I. Female Specific problems
 1. Sports Amenorrhea.
 2. Injury to female reproductive tract.
 3. Menstrual Synchrony.
 4. Sex determination.
 5. Exercise and pregnancy.
 6. Eating disorders in athletes

- II. Common Infectious disease:
 1. Common Cold
 2. Diarrhoea
 3. Dysentery
 4. Typhoid
 5. Cholera
 6. Amoebiasis
 7. Food Poisoning
 8. Tuberculosis
 9. Malaria
 10. Hepatitis
 11. Venereal disease etc.
- III. AIDS in sports people.

Recent advances and evidence based practice in Sports physiotherapy

SECTION A

I. Exercise and Common Pulmonary Conditions

- 1.Exercise induced bronchial obstruction
- 2.Exercise in chronic airway obstruction
- 3.Air pollution and exercise

II. Exercise and Cardiac Conditions

- 1.Exercise prescription for heart disease
- 2.Exercise in primary prevention in ischemic heart disease
- 3.Exercise for secondary prevention of ischemic heart disease

III. Diabetes and Exercise

- 1.Exercise in diabetic patients
- 2.Exercise as a method of control of diabetes

IV. Protective equipment design of shoe safety factors in equipment.

Health club and fitness concept, use and misuse of equipment

V. Special concerns for handicapped athletes

VI. Disability sports, Paralympics

SECTION B

- I. Exercises for special categories
 1. Child and adolescent athlete's problems
 2. Special problems of older athletes
 3. Sports and exercise programme for geriatrics and rheumatic population
- II. Doping in Sports
- III. IOC prohibited drugs- groups and classifications
- IV. IOC rules and regulations on doping in sports hazards of prohibited substances
- V. **Identification of talent for sports** –
 1. Meaning and its importance
 2. Detailed procedure for screening and identification of sports talent
 3. Prediction of adult potentials at the young age.
 - VI Sports Pharmacology and medico-legal issues in sports
 - VII Segmental Stabilization Concepts of spine
 - VIII Emergency medical planning and cover for Sports events
 - IX Exercise for growing bones
 - X Effect of physical activity intervention in youth
 - XI Precision heart rate training
 - XII Current concepts in obesity management
 - XIII Electromyography and Rehabilitation
 - XIV Current concepts in comprehensive physical examination for the instabilities of knee
 - XV Current concepts in tendinopathies

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2. Eisenberg, R. L., & Johnson, N. M. (2003). Comprehensive radiographic pathology (3rd ed.). St Louis, MO: Mosby.
3. Hughes, J., & Hughes, M. (110107). Imaging: Picture tests. Edinburgh: Churchill Livingstone.
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5. Redhead, D. N. (110105). Imaging: Colour guide. Edinburgh: Churchill Livingstone.
6. Yochum, T. R., & Rowe, L. R. (2005). Yochum and Rowe's essentials of skeletal radiology (3rd ed., Vols. 1-2). Baltimore, MD: Lippincott Williams & Wilkins.
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10. Cailliet, R. Neck and arm pain Philadelphia: FA Davis.
11. Cailliet, R. Shoulder pain Philadelphia: FA Davis.
12. Cailliet, R. Knee pain and disability Philadelphia: FA Davis.
13. Cailliet, R. Hand pain and impairment Philadelphia: FA Davis.
14. Cailliet, R. Low back pain syndrome Philadelphia: FA Davis.
15. Cailliet, R. Soft tissue pain and disability Philadelphia: FA Davis
16. O'Sullivan, F.A. Davis, Philadelphia 110104. Physical rehabilitation: assessment and treatment.
17. Kuprian: Physical Therapy for Sports, W.B. Saunders
18. Malone: Orthopaedic and Sports Physical Therapy, C.V. Mosby.
19. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
20. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
21. Gould: Orthopaedic Sports Physical Therapy, Mosby.
22. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann.
23. Gait analysis – Perry J., Black Thorofare, New Jersey, 110102.
24. McArdle, Katch, Katch: Exercise Physiology Edition IV.
25. Era Volinski: Nutrition and exercise in Sports - CRC Press, New York.
26. George A. Brooks, Thomas D. Fahey: Exercise Physiology – Human Bioenergetics and its applications 11084, John Wiley & Sons, New York.
27. Astrand & Rodahl: Text Book of Work Physiology, McGraw Hill.
28. Fox and Mathews - The Physiological Basis of Physical Education and athletics – Holt Saunders.
29. Erston and Reilly - Kinanthropometry and Exercise Physiology Laboratory Manual tests, Procedures and Data - F & FN Spon Madras.
30. Rowland - Developmental Exercise Physiology - Human Kinetics.
31. Clarke - Exercise Physiology - Prentice Hall.

32. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers Delhi.
33. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A. Davis.
34. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
35. Wood & Baker: Beard’s Massage, W.B. Saunders.
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37. Werner Kuprian: Physical Therapy for Sports, W.B. Saunders.
38. Kennedy: Mosby’s Sports Therapy Taping Guide.
39. Malone: Orthopedic and Sports Physical Therapy, C.V. Mosby.

40. William E. Prentice: Therapeutic Modalities in Sports Medicine - Mosby.
41. William E. Prentice: Rehabilitation Techniques - Mosby.
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43. John Low & Reed: Electrotherapy Explained, Butterworth.
44. Meryl Roth Gersh: Electrotherapy in Rehabilitation, FA Davis.
45. Joseph Kahn: Principles and Practice of Electrotherapy, Churchill Livingstone.
46. Harrelson and Andrews: Physical Rehabilitation of Injured Athlete.
47. Nelson and Currier: Clinical Electrotherapy, Prentice Hall.
48. Greenman: Principles of Manual medicine, William and Wilkins.
49. Kuprian: Physical Therapy for Sports, W.B. Saunders.
50. . Bates: Aquatic Exercise Therapy, W.B. Saunders.
51. Michlovitz - Thermal agents in Rehabilitation - F.A. Davis.
52. Lehmann - Therapeutic Heat and Cold - Williams & Wilkins
53. Morgan and King: Introduction to Psychology - Tata McGraw Hill.
54. Suinn: Psychology in Sports: Methods and applications, Surjeet Publications.
55. Grafiti: Psychology in contemporary sports, Prentice Hall.
56. Manual of nerve conduction velocity techniques – De Lisa, Raven press, New York, 11082.
57. Physical rehabilitation: assessment and treatment – O’Sullivan, F.A. Davis, Philadelphia 110104.
58. Bio-feedback – A practitioners guide – Kerb D, Guiford press
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60. Luttgens K., Hamilton N.: Kinesiology – Scientific Basis of Human Motion, Brown & Benchmark.
61. Kreighbaum E., Barthels K.: Biomechanics – A Qualitative approach for studying Human Motion, MacMillan.
62. Rasch and Burk: Kinesiology and Applied Anatomy, Lee and Fabiger.
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 82. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams and Wilkins.
 83. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
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 86. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications,
 87. W.B. Saunders.
 88. Hartley: Practical Joint Assessment, A Sports Medicine Manual, upper and lower quadrants, C.V. Mosby.
 89. Albert: Eccentric Muscle Training in Sports and Orthopedics, W.B. Saunders.
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 91. Torg, Welsh and Shephard: *Current Therapy in Sports Medicine III* - Mosby.
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 93. Nordin and Frankel: *Basic Biomechanics of Muscular Skeletal System*: Williams
 94. and Wilkins.
 95. Mc Ardle, Katch, Katch: *Exercise Physiology*.
 96. Brukner and Khan: *Clinical Sports Medicine*, McGraw Hill.
 97. O'Leary: *Drugs and Doping in sports*.

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 99. Lee and Dress: *Orthopaedic Sports Medicine* - W.B Saunders
- Kurt Dorr and Jonathan S. Rakich: *Hospital Organization and Management*:

Pediatrics physiotherapy

1. CLINICAL, PHYSICAL & FUNCTIONAL DIAGNOSIS IN PEDIATRIC PHYSIOTHERAPY

2. PEDIATRIC PHYSIOTHERAPY

3. *Recent advances* PEDIATRIC PHYSIOTHERAPY

SPECIALITY PAPER -ONE

COURSE CODE: MPT-104

1. CLINICAL, PHYSICAL & FUNCTIONAL DIAGNOSIS IN PEDIATRIC PHYSIOTHERAPY

Course outcome

On successful completion of this unit, it is expected that students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Pediatric (neurology, cardio-respiratory, musculoskeletal) medicine & interpret clinical tests and special investigations commonly used in the diagnosis of conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Explain the medical management of various conditions typically presented in Pediatric disorders.
5. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Pediatric physical therapy practice.
6. Demonstrate a broad range of technical skills, including the ability to manage common pediatric conditions.

SECTION- A

Unit 1

1. Review of Embryology
2. Maturation, patho-physiological & recovery process in the CNS
3. Genetic basis of pediatric disorders
4. Pain assessment in neonates & children

5. Patho-mechanics and clinical biomechanics of posture and movement in various Pediatric conditions
6. Analysis and diagnosis of functional mechanics and patho-mechanics of gait in children
7. Principles, procedure, interpretation and significance of Diagnostic imaging (CT, MRI, Ultra sound, bone scan, PET scan, fMRI) for clinical and functional diagnosis in various orthopedic, cardio-respiratory and neurological conditions in children
8. Clinical examination in general and physical and functional diagnosis for detection of movement dysfunction
9. Principles of pathological investigations, Electro-diagnosis and its interpretation related to common pediatric disorders- Laboratory investigation, clinical tests (EEG, ECG, Evoked potentials, qualitative and quantitative EMG, NCV & Biofeedback)
10. Evaluation of typical and atypical development of children in various domains of development (Gross, fine, cognitive, speech & language, personal social and adaptive functions)

11. Evaluation, epidemiology, symptomatology and patho-physiology of common Pediatric congenital, cardio-respiratory, neurological and musculo-skeletal disorders
12. Clinical, physical and functional diagnosis of developmental disorders
13. Neurodevelopment assessment
14. Hand function-Assessment and diagnosis
15. Theories of Motor control and Motor learning processes
16. Principles, administration and interpretation of Developmental screening tools

SECTION- B

Unit 2

17. Voluntary control assessment
18. Outcome measures used in Pediatric Physiotherapy
19. Pre and post- surgical physiotherapeutic (Physical and functional) evaluation for various surgical conditions in children
20. Anthropometrics measurements in children- Principles, methods, normal values for different ages, deviation and its clinical and functional significance
21. Exercise testing & Physical fitness assessment in children with & without disability (Range of motion, Muscle strength, endurance and skills, Body composition, Cardiac efficiency tests and spirometry)
22. Fitness evaluation in children for sports
23. Physical and functional assessment for Aids, appliances & adaptive devices in Pediatric disorders
24. Physical disability evaluation and disability diagnosis
25. Assessment of various pediatric medical and surgical conditions
26. Equipment's in Pediatric physical therapy such as:
 - a. EMG and Biofeedback
 - b. Gym ball
 - c. NMES
 - d. Gait analyzer

- e. Treadmill
- f. Test manual & kits used for developmental evaluation & screening

SPECIALITY PAPER -TWO

COURSE CODE: MPT-203

2. Pediatric Physiotherapy

Course outcomes

On successful completion of this subject it is expected that students will be able to-

- i. Demonstrate an understanding of dysfunctions affecting Pediatric musculoskeletal, neurological and cardio -respiratory system including their pathophysiology.
- ii. Demonstrate a range of technical skills related to Pediatric therapy such as NDT, Sensory integration concept, classification and their application following diagnosis of dysfunction, indication, contraindication and adjunct therapies.
- iii Demonstrate specific rehabilitation skills, principles of rehabilitation of Pediatric disorders.
- iv Explain factors involved in effective management of patients and also justify the importance of preventive care in rehabilitation

SECTION- A

Unit 1

- 1.Genetic counseling
- 2. Physiotherapy management of growth and developmental disorders (gross motor, fine, speech & language, personal- social –adaptive
- 3. Therapeutic techniques used in Neuro- pediatric conditions- Handling & positioning techniques, NDT, Vojta, Roods, CIMT, Sensor-motor re-education, PNF, Peto, Temple Fay, Phelps
- 4. Adjunct therapies- Manipulation, mobilization, taping, MFR, Cranio-sacral therapy, Body suits, hydrotherapy, hippo-therapy
- 5. Pain control & management in children
- 6. Motor learning techniques
- 7. Sensory integration disorders and management
- 8. Management of perceptual and cognitive disorders
- 9.Play behavior & its clinical application in therapy
- 10. Integrated approach in management of Pediatric disorders
- 11. Neonatal care⁴⁷⁹ and early intervention for risk babies
- 12. Physiotherapy management for congenital loco-motor disorders including prosthetic and orthotic prescription

13. Pediatric disability management at institutional & community levels
14. Pre and Post-operative management of pediatric surgeries
15. Rehabilitation of common pediatric musculo-skeletal disorders
16. Management of progressive loco-motor disorders- Neuropathic and Myopathic conditions

SECTION- B

Unit 2

17. Management of learning disabilities, ADHD, Autism, Developmental coordination disorders and behavioral disorders
18. Physiotherapeutic management of A.D.L and functional activities
19. Sports training in pediatrics
20. Psychological and mental health problems in children
21. Management of Child abuse and its associated problems
22. Management of common congenital, neurological, musculo-skeletal and cardio- respiratory disorders
23. Vocational rehabilitation for pediatric disorders
24. Metabolic disorders and their management
25. Exercise prescription for pediatric disorders
26. Oromotor dysfunction in children

SPECIALITY PAPER THREE

COURSE CODE: MPT-204

3. RECENT ADVANCES IN PEDIATRIC PHYSIOTHERAPY

Course outcomes

On successful completion of this subject, it is expected that students will be able to:

1. Understand and apply the information regarding recent advances in Pediatric Physiotherapy for patient care.
2. Search the evidences available for assessment and management of Pediatric conditions.
3. Apply the evidences available for the management of various Pediatric conditions

SECTION- A

Unit 1

1. Advanced instruction in physical examination, diagnosis, treatment and reassessment of the Pediatric neurological, musculoskeletal, cardio – respiratory system
2. Psychosocial affects in children and parents
3. Evidence based practice for exercise prescription for home program
4. Report writing for clinical cases & research
5. Recent advances in prescription, indications, assessment and training for orthosis, prosthesis and adaptive equipment in physically challenged children
6. EBP in Musculoskeletal and Neurological loco-motor disorders in children

SECTION- B

Unit 2

7. Rationale of basic and advanced investigative procedures with differential diagnosis
8. EBP & recent advances on the role of Physical therapy in public and special schools-
9. Recent advances in exercise prescription for children
10. EBP for management of pediatric oncology & burns
11. Recent advances in Pain control, assessment & management in children
12. Equipment's, assessment & treatment in neonatal & pediatric intensive care units
13. Recent advances in instrumentations, theories, handling and pediatric physical therapy techniques
14. Problem based learning relevant to clinical conditions typically seen in pediatrics

Books

1. Scientific basis of human movement –Gowitzke, Williams and Wilkins, Baltimore,
2. Clinical biomechanics of spine – White A, and Panjabi- J, B. Lippincot, Philadelphia
3. Human Neuroanatomy – Carpenter M.B. Williams & Wilkins, Baltimore,
4. Physical therapy in early infancy – Wilhelm, Churchill Livingstone, New York
5. Physical therapy for children – Campbell Suzann K. W.B Saunders, Philadelphia,
6. Physical management of multiple handicapped – Fraser, William and Wilkins, Baltimore.
7. Elements of paediatric physiotherapy – Eckersley, Churchill Livingstone, Edinburgh,
8. Physiotherapy in paediatrics - Shepherd R Heinmann, London,
9. The growth chart – WHO, Geneva,
10. Orthotics in neurological rehabilitation – Aisen, Demos Publication, New York
11. Electrodiagnosis⁴⁸² in diseases of nerve and muscle – Kimura J, F.A. Davis, Philadelphia.

12. Orthopaedic physical therapy – Donatteli, London, Churchill Livingstone,
13. Gait analysis – Perry J., Black Thosofare, New Jersey,
14. Biofeedback – A practitioner’s guide – Kerb D, Guilford press.
15. Abnormal postural reflex activity caused by Brain lesions – Bobath B. Aspen publications, Rockville, 1897.
16. Disorders of voluntary muscle – Eagel, Churchill, Livingstone, Edinburgh
17. Proprioceptive Neuro muscular facilitation techniques – Knot M. and Voss, Haroer and Row, New York
18. Child with Spina Bifida – Anderson E.M, and Spain B. Methun, London
19. A manual of neonatal intensive care – Robert N.R.C, Edward Arnold, London
20. Pulmonary rehabilitation: guidelines to success – Hoidkina, Butterworth, Boston,
21. Cardiac rehabilitation – Amundsen L.R, Churchill, Livingstone, London

Obstetrics and Gynaecology physiotherapy

1. Clinical, Physical and Functional diagnosis in OBG Physiotherapy
2. OBG Physiotherapy
3. *Recent advances in OBG Physiotherapy*

SPECIALITY PAPER -ONE
COURSE CODE: MPT-104

1. Clinical, Physical and Functional diagnosis in OBG Physiotherapy

Course outcomes

On successful completion of this unit, it is expected that students will be able to:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in OBG conditions & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on OBG physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related OBG conditions.

SECTION- A

Unit 1

REVIEW OF ANATOMY, PHYSIOLOGY, BIOMECHANICS AND DISORDERS OF MENSTRUAL CYCLE

- Anatomy of female reproductive system and abdominal wall
- Contents of the pelvic cavity- Pelvic diaphragm, Pelvic floor muscles, Perineum and external genitalia
- Pelvic axis, position, obstetric diameters and shape and abnormal bony pelvis

- Clinical biomechanics and patho-mechanics of spine, female pelvis, posture, movement and gait.
- Ovulation induction, Ovarian function, clinical aspects of ovulation
- Premenstrual syndrome
- Polycystic ovarian syndrome
- Menstruation cycle and other clinical phenomena such as amenorrhea, dysmenorrhea, hemorrhagia, polymenorrhea, oligomenorrhea and hypothalamic pituitary dysfunction

REVIEW OF PREGNANCY, LABOR AND PUERPERIUM

- Preconception health, factors affecting conception
- Conception
- Physiological changes during pregnancy
- Physiology of labor
- Physiological changes and physical problems in puerperium
- Injuries of uterine support & pelvic joints during labor, Repair of perineum after delivery
- Anatomical & physiological changes during postpartum period

REVIEW OF CONTRACEPTION, STERILIZATION AND FERTILITY

- Inject able and implantable contraception
- Intra uterine devices
- Abortion and Miscarriage
- MTP and sterilization
- Fertility, infertility, sub fertility

CLINICAL DIAGNOSIS AND INVESTIGATIONS IN HIGH RISK PREGNANCY

- Abortion, ectopic pregnancy
- Heart disease in pregnancy assessment
- Diabetes mellitus in pregnancy
- UTI in pregnancy
- HIV in pregnancy
- Trauma in pregnancy
- Hypertension in pregnancy
- Gastrointestinal disorders in pregnancy

- Viral exposure during pregnancy
- Vaginal birth after cesarean section

UROGYNAECOLOGY SYSTEM

- Review of mechanism of continence and voiding difficulties
- Review of Sexual dysfunction in Urogynecology
- Assessment of Urinary bladder dysfunction
- Genital Prolapse, Assessment and diagnosis
- Other displacements of uterus, assessment and diagnosis
- Overactive bladder syndrome, assessment and diagnosis

SECTION- B

Unit 2

THE AGEING FEMALE

- Anatomical & physiological & psychological changes of Menopause
- Assessment and diagnosis of Senile osteoporosis & related complications
- The climacteric- assessment and diagnosis

INVESTIGATIONS IN OBSTETRICS AND GYNECOLOGY WITH INTERPRETATION

- Pregnancy tests and investigations
- Imaging techniques in obstetrics and gynecology
- Urodynamics investigations
- Investigations in endocrinal disorders in females

Instrumentation for assessment of Pelvic floor muscles- Perineometer

- Outcome measures in OBG Physiotherapy

MISCELLANEOUS

- Antenatal physiotherapy assessment.
- Postnatal physiotherapy assessment.
- Breast function, disorders and assessment
- Abdominal incisions & assessment
- Anthropometric measurements
- Assessment, clinical tests and diagnosis of movement dysfunction and other musculoskeletal dysfunctions during pregnancy and postpartum period

SPECIALITY PAPER TWO

COURSE CODE: MPT-203

2.OBG Physiotherapy

Course outcomes

1. Develop a management plan, generally including some lifestyle factors, in co- operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.
2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.
3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.
4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients

SECTION- A

Unit 1

PHYSIOTHERAPY MANAGEMENT OF MENSTRUAL PROBLEMS

- Nutrition in adolescence
- Physiotherapy management of puberty disorders

PHYSIOTHERAPY MANAGEMENT OF MATERNAL MUSCULOSKELETAL DISORDERS

- Neck and upper back strain
- TMJ Pain
- Thoracic outlet syndrome, costal rib pain
- Carpel tunnel syndrome
- Dequervain's diseases
- Diastasis Recti abdominis
- Sacroiliac joint dysfunction (anterior and posterior innominate)
- Symphysis pubis dysfunction
- Low back pain, ⁴⁸⁷piriformis syndrome, coccyx pain
- Knee and patella dysfunction

- Nerve palsies, muscle and tendon injuries

PHYSICAL THERAPY MANAGEMENT DURING ANTENATAL PERIOD

- Early bird classes
- Methods of relieving pregnancy discomfort
- Preparation for labour
- Relaxation techniques and Stress Management during pregnancy
- Aquanatal exercises during antenatal period
- Exercise prescription during antenatal period

Orthotic management during pregnancy

- Ergonomics in pregnancy

PHYSICAL THERAPY MANAGEMENT DURING LABOUR PAIN

- Perinatal care- Coping strategies for labour
- TENS in labour
- Traditional practices related to pregnancy and postpartum management
- Positions for delivery, types of delivery
- Pain management and management of discomforts during labour
- Maternal positions and state during labour
- Stress management during labour
- Relaxation techniques
- Breathing techniques
- Massage

PHYSICAL THERAPY MANAGEMENT DURING POSTPARTUM PERIOD

- Exercise prescription during postpartum period
- Lactation management and breast clinic
- The postnatal period, postnatal exercises and advise
- Alternative therapies related to pregnancy and postpartum management
- Schools of manual therapy and joint mobilization techniques
- Aquanatal exercises during postnatal period
- Orthotic management during postpartum
- Stress management during postpartum period

- Maternal position and state during postpartum period
- Ergonomic advice in postpartum period
- Massage techniques
- Handling techniques of new born

SECTION- B

Unit 2

GENERAL GYNAECOLOGICAL INFECTIONS

- Physiotherapy management for incontinence
- Physiotherapy management for genital prolapse
- Physiotherapy management for endometriosis
- Physiotherapy management for chronic pelvic pain and dyspareunia
- Physiotherapy management for pelvic inflammatory disease
- Physiotherapy management for sexually transmitted diseases

PHYSIOTHERAPY MANAGEMENT FOR SEXUAL DYSFUNCTION

- Sexual desire disorders- Hypoactive sexual desire dysfunction, Sexual Aversion disorders
- Sexual arousal disorders
- Sexual pain disorders- Dyspareunia, Vaginismus
- Female orgasmic disorder

OPERATIVE PROCEDURES AND PHYSIOTHERAPY MANAGEMENT

- Principles of surgery and physiotherapy management of intra operative complications
- Preoperative and post operative care
- Hysterectomy and physiotherapy management
- Fertility awareness and family planning methods
- Cancer rehabilitation (Breast and Cervical cancer)

MISCELLANEOUS

- Physiotherapy management for musculoskeletal complications during menopause
- Nutrition for menopause women
- The method of infection control for physiotherapist working with women's health
- Assisted reproduction treatments

SPECIALITY PAPER -THREE

COURSE CODE: MPT-203

3. Recent advances and Evidence Based Practice in OBG physiotherapy

Course outcome

On successful completion of this subject it is expected that students will be able to-

1. Understand and apply the information regarding recent advances in OBG physiotherapy for patient care.
2. Search the evidences available for assessment and management of OBG conditions.
3. Apply the evidences available for the management of various OBG conditions.

SECTION- A

Unit 1

Antenatal Pilates and Postnatal Pilates

Alternative therapies in OBG conditions

Alternate approaches to fitness in antenatal and postpartum period

Recent advances in outcome measures used in OBG physical therapy

EBP and Recent advances of electrotherapy in OBG Physiotherapy

EBP and Recent advances of exercise therapy in OBG Physiotherapy

SECTION- B

Unit 2

EBP and Recent advances of Hydrotherapy in OBG Physiotherapy

EBP and Recent advances of Thermotherapy in OBG Physiotherapy

EBP and Recent advances of Cryotherapy in OBG Physiotherapy

EBP and Recent advances of joint mobilization techniques in OBG Physiotherapy

Recent Advances in Pelvic Floor Assessment, Devices/Instrumentation for pelvic rehabilitation

EBP of Nutrition in women from adolescence to menopause

EBP and Recent Advances in PT following OBG surgeries

EBP and Recent Advances in Breast Disorders from menarche to menopause

Recommended Reading:

1. Gray, Henry. Anatomy of the Human Body,
2. C.Guyton, John E. Hall, Textbook of medical physiology, W.B.Saunders company- Harcourt Brace Jovanovich, Inc.
3. D.K.James et al. High Risk Pregnancy-management options, Saunders-An imprint of Elsevier.
4. Margaret Polden, Jill Mantle, Physiotherapy in obstetric and gynecology, Butterworth-Heinemann, Linacre house, Jordan Hill, Oxford,

Ann Thomson, Tidy's physiotherapy, Varghese publishing House, Bombay.

6. Ruth Sapsford, Joanne Bullock-Saxton, Sue Markwell. Women's Health: A Textbook for Physiotherapists,
7. Scientific basis of human movement –Gowitzke, Williams and Wilkins, Baltimore,
8. Clinical biomechanics of spine – White A, and Panjabi- J, B. Lippincot, Philadelphia
9. Physiotherapy in Obstetrics and Gynaecology- 2nd edition- Jill Mantle, Jeanette Haslam, Sue Bartom. Forwarded by Professor Linda Cardow
10. Physiotherapy in Obstetrics &Gynaecology – Polden& Mantle, Jaypee Brothers, New Delhi,
11. D.C Datta -Textbook of Gynaecology. 1st edition
12. Women's Health- A textbook for Physiotherapists. R.Sapsford J. Bullock. Saxton. S, Markwell.- (W.B. Saunders)
13. Obstetrics &Gynaecologic care in Physical Therapy- 2nd edition-Rebecca.C. Stephenson, Linda.J.O'contuor
14. Clinical Cases in Obstetrics&Gynaecology- Haresh U. Doshi, published by Arihant publishers
15. Advanced in Obstetrics &Gynaecology(vol 2)- ShaliniRajaram, SumitaMehta,NirajGoel(Jaypee brothers.
16. Physiotherapy Care for Women's Health – R. Baranitharan, V. MahalaKshmi (jaypee brothers)
17. Williams O Obstetrics- 22nd edition- F.GaryCunninghan, Krenneth J Leveno, Steven L Bloom.

18. Women's Health- 5th edition edited by Deborah Waller, Ann McPherso (oxford)

Steven G Gabbe, Jennifer.R. Niebyl Joe Leigh simpson- Obstetrics Normal & Problem Pregnancies - 5th edition- associate editors : Henry Galon, Laura Guetzl, Mark Landson, Eric.R.M. Jauniau

Oncological Physiotherapy

1. Assessment methods & Medial surgical aspects of the conditions
2. Physiotherapy techniques and management of the conditions
3. Recent advances in the specialty

SPECIALITY PAPER ONE

COURSE CODE: MPT-104

1 Clinical functional and physical diagnosis in oncological physiotherapy

Course outcome

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in oncology & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on oncological physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related oncology conditions.

SECTION- A

Unit 1

Assessment of clinical signs and symptoms, physical and functional evaluation, differential diagnosis of (bone and soft tissue, breast, gynecological, lung, GI, head and neck and pediatric) cancers

clinical analysis of cardiorespiratory fitness, posture, gait, movement and movement dysfunction in cancer patients

Outcome measures and evaluation in oncological physiotherapy for cognitive impairment and disability, focal disabilities, global measures of disability, motor impairment, ADL and extended ADL tests, Quality of life, pain, stress and anxiety.

Diagnostic imaging- types of diagnostic imaging techniques in various types of cancer, clinical interpretation and significance (Chest X-Ray, Barium swallow, Barium enema, USG abdomen, Endoscopy, colonoscopy Mammography and mammogram, MRI, Ultra sound, PET and SPECT, CT scan Gastroscopy, Laparoscopy, Pap smear test, bone scan and other diagnostic imaging, fiber optic endoscopy for diagnosis) histo-pathological, hematological, bacteriological investigations. Nuclear and radio imaging.

Principles of pathological, hematological, bacteriological investigations related to oncological disorders with interpretation.

SECTION- B

Unit 2

Influence and relation of physical activity, diet, nutrition, life style , obesity and anthropometric measurement in cancer

Neuropsychological tests.

Evaluation of Cancer Complications like Lymphedema, musculoskeletal, neurological, cardio respiratory.

Exercise and cancer related fatigue and its evaluation

Detailed lymphatic system examination

Medical intervention (radiation, chemotherapy and surgery) in cancer

Oncological physiotherapy

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Exercise and cancer related fatigue and its evaluation

Detailed lymphatic system examination

Medical intervention (radiation, chemotherapy and surgery) in cancer

1. Oncology-Epidemiology,classification,symptomatology,patho- physiology and management of different oncological condition

Common pediatric oncology conditions and their assessment, signs and symptoms medical management and physiotherapy treatment

Common pediatric oncology conditions and their assessment, signs and symptoms medical management and physiotherapy treatment.

SECTION- B

Physiotherapy intervention for

· Head and neck cancers.

Breast cancer

Cancers of Reproductive system.

Bone tumors.

Systemic cancers.

CNS Neoplasia.

Lung cancer.

Metastatic cancers

Gastrointestinal cancers.

Chemotherapy, radiation therapy and adjunct therapy in cancer patients. Physiotherapy management for neuro-musculoskeletal complications due to cancer treatments

Physiotherapy management for various dysfunctions (Bowel and Bladder, Sexual, Neuro-musculoskeletal and Nutritional deficiency) seen in cancer patients.

Supportive and Palliative therapy, and pain management in cancer and palliative therapy in cancer patients

Rehabilitation act and financial aid for cancer patients

Psychosomatic conditions in cancer and their management

Physiotherapy management in Intensive care units(ICU)of cancer patients

Aids and appliances, adaptive functional devices to improve dysfunction in cancer patients

FES, NMES, Biofeedback, Various equipment used in oncology physiotherapy, Muscle re-education approach, Sensory rehabilitation, Myofascial release technique, Inhibitory and facilitation technique, Functional re-education, skill training, A.D.L training, Tapping in oncological conditions. Balance training

Problem based learning for various clinical conditions in oncology physiotherapy

3. Recent advances and evidence based practice in oncological physiotherapy

Learning objectives: On successful completion of this subject it is expected that students will be able to-

1. Understand and apply the information regarding recent advances in neuro physiotherapy for patient care.
2. Search the evidences available for assessment and management of neurological conditions.
3. Apply the evidences available for the management of various neurological conditions

SECTION- A

Unit 1 .

Recent advances in oncological physiotherapy and Evidences in interventions for oncology related impairments.

Genetic counselling, Stem cell therapy, Gene therapy, Targeted therapy, Immunotherapy, hormone therapy, thermal ablation, radionics, atomics and Nano medicine

Recent advances in pain modulation and rehabilitation

Institutional & community-based rehabilitation and vocational rehabilitation in oncological patients

Recent advancement in oncology Orthosis – prescription and training. Prosthetic management for mastectomy

Psychiatry problems in oncological conditions and physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of disabilities

Self-treatment, Exercise precaution, management and exercise prescription for home program, Report writing. Conceptual framework for clinical practice.

Requirements for medical opinion or treatment, documentation, prescription, management and advice. Protocol writing

Recent oncological Physiotherapy technique - Mental imagery technique, virtual reality therapy, Pilate's therapy, Hydrotherapy/ Aqua therapy in oncological patients.

SECTION- B

Unit 2

Impact of cancer treatment on function and its rehabilitation Psychosocial impact on cancer patient, spouse, family members, society

History of Evidence Based Practice in physiotherapy, clinical decision making, importance of evidence-based practice, Evidence about diagnosis, prognosis and therapy. Locating evidences, challenges and barriers in EBP.

Recent advances in physiotherapy management of head Neck cancer

Recent advances in physiotherapy management of breast cancer

Recent advances in physiotherapy management of Bone tumors

Recent advances in physiotherapy management of Lung and respiratory tract Cancer
Recent advances in physiotherapy management of systemic cancer
Sports and physical training in oncological conditions

Recommended books

1. Cancer Rehabilitation: Principles and Practice by Michael Stubblefield & Michael O'Dell 1st Edition
2. Cancer Rehabilitation and Survivorship: Trans disciplinary approaches to Personalized care by Joanne L & Patricia Schmitt 1st Edition
3. Palliative Care & Rehabilitation of Cancer Patients (Cancer Treatment and research) by Charles F. Von Gunten 1st edition
4. Textbook of Palliative Medicine and Supportive Care by Eduino Bruera 2nd edition
5. ACSM's Guide to Exercise and Cancer survivorship By American College of Sports medicine, Melinda Irvin
6. Fatigue in Cancer: A Multidimensional Approach by Maryl Lynne Winningham, Margaret Barton Burke
7. The Concise Guide to Physiotherapy - Volume 2: Treatment edited by Tim Ainslie.
8. Innovations in Cancer and Palliative Care Education by Lorna Foyle, Janis Hostad.
9. Practical Evidence-based Physiotherapy By Rob Herbert 1st edition
10. Oxford Textbook of Palliative Medicine By Geoffrey Hanks, Nathan I. Cherny, Nicholas A. Christakis, Stein Kaasa 4th Edition
11. Legal Aspects of Physiotherapy By Bridgit Dimond 2nd Edition
12. Rehabilitation and palliation of cancer patients: (Patient care) By Herrmann Delbrück 1st edition
13. Physiotherapy a Psychosocial Approach edited by Sally French 1st Edition
14. Everyone's Guide to Cancer Survivorship: A Road Map for Better Health By Ernest Rosenbaum, Holly Gautier, R.N 1st edition
15. Lymphedema: A Concise Compendium of Theory and Practice By Byung-Boong Lee, John Bergan, Stanley G. Rockson 1st edition
16. Contemporary Issues in Women's Cancers By Suzanne Lockwood 1st Edition
17. Rehabilitation in Cancer Care by Rankin 1st Edition

18. Occupational Therapy In Oncology by Cooper 2nd edition
19. Cancer Rehabilitation: An Introduction for Physiotherapists and Allied Professions by Patricia A. Downie 1st Edition
20. Potential & Possibility Rehabilitation at end of life by Jenny Taylor 1st Edition
21. Cancer Pain Management: A Comprehensive Approach by Karen H. Simpson, Keith Budd
22. Exercise and Cancer Survivorship: Impact on Health Outcomes and Quality of Life edited by John Saxton, Amanda Daley 1st edition
23. Physical Rehabilitation by Osullivan.S.B. & Schmitz.T.J 3rd Edition
24. Physiological Basis of Rehabilitation Medicine by Downey.J.A. & Myers.S.J 2nd Edition
25. Krusens Handbook Of Physical Medicine And Rehabilitation Kottke.F.J. & Lehmann.J.F 4th Edition
26. Clinical Decision Making In Rehabilitation by Basmajian.J.V. & Banerjee.G.N 10th Edition.
27. Rehabilitation Medicine by Delisa.J.A.& Gans.B.M 2nd Edition
28. Physical Medicine and Rehabilitation by Braddom.R.L 1st edition
29. Evidence-Based Rehabilitation; a Guide to Practice by Law.M. 1st edition
30. Assistive Technologies; Principles and Practice by Cook.A.M. & Hussey.S.M. 1st Edition
31. Home Rehabilitation; Guide To Clinical Practice by Anemaet.W.K. & Moffa- Trotter.M 1st Edition
32. Manual Of Physical Medicine And Rehabilitation by Brammer.C.M.;Spires.M 1st edition
33. Essential Physical Medicine And Rehabilitation by Cooper 1st Edition
34. Management In Rehabilitation by Schuch C. P & Sekerak D. K 1st edition
35. American Cancer Society Textbook Of Clinical Oncology By Murphy.G.P.;Lawrence.W 2nd Edition
36. Cancer: Principles And Practice Of Oncology By Devita.V.T; Hellman.S. 7th Ed
37. Clinical Oncology; By Abeloff.M.D; Armitage.J.O. 3rd Ed.

38. Bone Tumours (A Clinico Pathological Study) by Vastrad.M.C. 1st edition
39. Therapeutic Exercise by Caroline Kisner 5th edition
40. Exercise Management: Concepts and Professional Practice by Laurel T. Mackinnon 2nd Edition
41. Advances In Exercise Immunology By Laurel T. Mackinnon 2nd Edition
42. Principles Of Exercises In Physiotherapy 2nd edition
43. Kinesiology Of The Musculoskeletal System : Foundations Of Rehabilitation By Donald A. Neumann 2nd Edition
44. Exercise Therapy: Prevention & Treatment Of Disease by John Gormley, Juliette Hussey 1st edition
45. Physical Examination & Health Assessment by Carolyn Jarvis 5nd Edition
46. Practical Evidence-Based Physiotherapy By Robert Herbert, Gro Jamtvedt 4th edition
47. Principles Of Exercise Therapy by M. Dena Gardiner 6th edition
48. Clinical Decisions In Therapeutic Exercise by Patricia E. Sullivan, Prudence D. Markos 2nd edition
49. Therapeutic Exercise : Treatment Planning For Progression Frances E. Huber, Chris L. Wells 1st edition
50. Textbook Of Therapeutic Exercises By Narayanan 1st edition
51. Exercise Management Concepts And Professional Practice by Laurel T. Mackinnon 1st Edition
52. Clinical Exercise Testing And Prescription 1st Edition
53. Evidence-Based Guide To Therapeutic Physical Agents 1st Edition
54. Therapeutic Exercise Moving Toward Function by Lori Thein Brody, Carrie M.Hall 2nd edition
55. Exercise In Health And Disease 2nd edition
56. Aquatic Rehabilitation by Richard Gene Ruoti, David Michael Morris, Andrew J. Cole 1st Edition
57. ACSM Resources For Clinical Exercise Physiology 1st Edition

58. Advanced Fitness Assessment And Exercise Prescription 3rd Edition
59. ACSMS Resource Manual For Guidelines For Exercise Testing And Prescription 4th Edition
60. ACSMS Guidelines For Exercise Testing And Prescription 6th Edition
61. Exercise Testing And Exercise Prescription For Special Cases by James S. Skinner 2nd Edition
62. Therapeutic Exercise by Basmajian.J.V. & Wolf.S.L 5th Edition.
63. Yogic Exercises: Physiologic And Psychic Processes by Ray.D.S 1st edition
64. Fitness Programming And Physical Disability by Miller.P.D 1st Edition
65. Community Rehabilitation Services For People With Disabilities by Karan.O.C. & Greenspan.S 1st edition
66. Essential Readings In Rehabilitation Outcomes Measurement by Dobrzykowski.E.A 1st edition
67. Disability Evaluation by Demeter.S.L. & Andersson.G.B.I 1st edition
68. Safer Lifting For Patient Care by Hollis.M. 3rd edition
69. Disabled Village Children by Werner.D. 1st edition
70. Conditioning With Physical Disabilities by Lockette.K.F. & Keyes.A.M. 1st edition
71. Community Based Rehabilitation Of Persons With Disabilities by Pruthvish.S 1st edition

REHABILITATION

COURSE CODE: MPT-104

Speciality-1: Physiotherapy in Rehabilitation Sciences.

Section-A

1. Definition, Concept, principles & Scope of Rehabilitation, Community, Health care delivery system, Health Administration, Institutional based rehabilitation and community based rehabilitation – its principles and differences, multi-disciplinary approach, role of national institutes, District rehabilitation centre and primary health centre. Physiotherapist as a Master Trainer in CBR & IBR.

2. Epidemiology of dysfunctions & advance skills of physical and functional assessment related to Community. Clinical decision-making skill in management of dysfunction

3. Evidence Based Practice & Recent advances in Community Health. Indian Health statistics

SECTION-B

4. Fitness and health promotion – Principles of fitness for health promotion in community, Nutrition and Diet. Stress management through yoga and psychosomatic approaches. Natural calamity & disaster management – Role of P.T. in disaster management team.

5. I.C.F. [Impairment, Disability, Handicapped and its implications] Evaluation of Disability & Compensation for Persons with disability Act – 1995 and related Government infrastructure.

6. Physiotherapy Ethics – code of conduct, Regulatory Agencies and Legal Issues. W.H.O.'s policies-about rural health care -Role of P.T.-Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&O./vocational guide in C.B.R. of physically handicapped person.

7. Public health education methods and appropriate media – Public awareness to the various disabilities, communications, message generation and dissipation.

8. Role of Government & NGOs in CBR, inter-sectoral programs and co- ordination, Implementation of the Act.

Speciality 2

COURSE CODE: MPT-203

- Rehabilitation –Assessment, Evaluation and Assistive Technology

SECTION -A

1. Orthotics & Prosthetics: definition, classification, bio mechanical principles; assessment and evaluation, prescription & fabrication
2. Designing & Training of UL, LL, trunk, neck Orthosis, footwear modifications in various conditions
3. Designing & Training of UL, LL prosthesis in Amputees.
4. Indications / Contraindications, psychological aspects of its application.
5. Use of adaptive devices, design & construction e.g. canes, walkers, wheelchairs.

SECTION- B

Industrial Health

6. Applied anatomy, physiology and biomechanics related to Industrial health.
7. Clinical decision making skill in assessment and management of dysfunction related to Industrial health.
8. Industrial physiotherapy- prevention of injuries, physiological restoration, rehabilitation in industrial injuries, work station adaptations/ modifications.
9. Environmental stress in the industrial area --Accidents due to

b] Chemical agents-Inhalation, local action, ingestion,

c] Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & evaluation of work place-mechanical stresses as per hierarchy –

- Sedentary table work –executives, clerk,
- Inappropriate seating arrangement- vehicle drivers
- Constant standing- watchman- Defence forces, surgeons,
- Over-exertion in labourers - common accidents

d] Psychological hazards- e.g.-executives, monotony & dissatisfaction in job, anxiety of work completion with quality,

- Role of P.T. in Industrial setup & Stress management- relaxation modes.
- Physiotherapy role in industry – preventive, promotive, curative, intervention, ergonomic and rehabilitative services.
- Ergonomic considerations and health promotion in the industry

11. Job analysis, job description, job demand analysis, task analysis, Employee fitness, job modification, Employment acts.

12. Vocational Rehabilitation; evaluation & management.

COURSE CODE: MPT-204

Speciality 3- : Physiotherapy in Clinical Rehabilitation conditions

SECTION-A

1.Rehabilitation in musculoskeletal conditions, sport sciences and health promotion

2.Rehabilitation in cardio-pulmonary conditions, and health promotion

SECTION -B

3 Rehabilitation in neurological conditions, movement & psycho-somatic disorders,
pediatric conditions

4 General fitness strategies- body mass composition, assessment, obesity and weight
control

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. External guides from other departments or institutes may be included for interdisciplinary researches. 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/Principals 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 practice in all types of healthcare setups independently as well as a team member.
4. Be able to screen, assess, diagnose, treat, prescribe and refer a patient independently.
5. Be able to conduct the patient evaluation and assessment as per condition.
6. Assess , analyse, and plan physiotherapy management.
7. Apply and evaluate physiotherapy management.
8. Advise patient on appropriate nutrition, exercises, rest, relaxation and other issues
7. Demonstrate professional practice.
8. Demonstrate autonomous physiotherapy practice.
9. Demonstrate⁵⁰⁷ 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

S . no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1.	Analyse and discuss the bio-medical, behavioural and social science bases of physiotherapy and integrate the bases into physiotherapy practice	<ul style="list-style-type: none"> • Be familiar with normal & 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 & its contribution to wellness. 	<ul style="list-style-type: none"> • 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

S . no.	Learning out-comes	Knowledge/comprehension	Applications / synthesis /evaluation
2	Collects assessment data relevant to the client's needs and physiotherapy practice.	<ul style="list-style-type: none"> • Informs the client of the nature and purpose of assessment as well as any associated significant risk. 	<ul style="list-style-type: none"> • 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.

S . no.	Learning out-comes	Knowledge/comprehension	Applications / synthesis /evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	<ul style="list-style-type: none"> • Be familiar with different assessment techniques. • Able to examine higher motor functions, cranial nerves,ROM,MMT,Muscle tightness, muscle tone,myotome,sensory evaluation,balance,co-ordination,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 	<ul style="list-style-type: none"> • 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.

S . no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
4	Assess, analyse, and plan physiotherapy management	<ul style="list-style-type: none"> • 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` 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Demonstrate safe, effective and efficient interventions. • Evaluate the effectiveness of the Interventions

S . no.	Learning out-comes	Knowledge/comprehension	Applications / synthesis /evaluation
6	Advise patient on appropriate nutrition, exercises, rest, relaxation other issues	Explain the impact of exercise and nutritional status of patient during treatment	Assess the patient's status after exercise and proper diet.
7.	Demonstrate professional Practice.	<ul style="list-style-type: none"> • Demonstrate attitudes and behavior acceptable to society and the profession • Practise in accordance with the Standards of Ethical Conduct • Explain the health and safety issues for patients and staff • Able to deliver safe, effective and timely physiotherapy interventions • Recognizes risk & hazards which can happen during intervention. • Ability to reflect and evaluate own practice • Modify and adapt professional practice in response to evaluation 	<ul style="list-style-type: none"> • Demonstrate professional behavior. • Demonstrate safe Practice Plan and show evidence of Professional development.

S . no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
8.	Demonstrate autonomous physiotherapy practice	<ul style="list-style-type: none"> • Recognize the critical conditions of patients • Be familiar with current literature and evidence based best practice 	<ul style="list-style-type: none"> • Independently assess and treat patients with single or multiple problems which needs physiotherapeutic intervention. • Demonstrate an ability to refer to other health professionals when beyond the scope of physiotherapy
9.	Demonstrate the ability to search and retrieve scientific literature	<ul style="list-style-type: none"> • Define search terms • Knowledge on available data search resources • Identify relevant sources of Research 	<ul style="list-style-type: none"> • Develop and modify search strategies appropriately complete searches using relevant and available resources such as electronic data bases. • Discuss different methods of statistical analysis in relation to different research designs. • Discuss the possible ethical implications and requirements in health research

S . no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
10.	Demonstrate an understanding of research methods.	<ul style="list-style-type: none"> • Have a basic understanding of the value of different research paradigms to physiotherapy research. • Demonstrate a basic understanding of research processes. • Understand the ethics of the research process including plagiarism and consent 	<ul style="list-style-type: none"> • Describe appropriate research methodologies that may be used to examine a variety of research questions. • Describe the key elements of research design. • Describe different methods of data Collection. • Demonstrate knowledge of basic biomedical statistics
11	Demonstrate the ability to critically analyse scientific literature	<ul style="list-style-type: none"> • Identify appropriate criteria to assess quality of different types of literature. 	<ul style="list-style-type: none"> • 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

S . no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
12	Prepare Report findings of critical analysis in a scientific format	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 inter disciplinary
- 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

Annexure- 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 ⁵²¹

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

ANNEXURE LOGBOOK PROFORMA

Department of

Period of posting; from.....to.....

Duration of posting;.....

Date of reporting;.....

Signature of HOD.....

Attendance sheet

Day	day	day	day	day	day	day
1	2	3	4	5	6	7
/ /20	/ /20	/ /20	/ /20	/ /20	/ /20	/ /20
Signature of physiother- apy faculty						

8	9	10	11	12	13	14
/ /20	/ /20	/ /20	/ /20	/ /20	/ /20	/ /20
Signature of physiotherapy faculty						
15	16	17	18	19	20	21
/ /20	/ /20	/ /20	/ /20	/ /20	/ /20	/ /20
Signature of physiotherapy faculty						
22	23	24	25	26	27	28
/ /20	/ /20	/ /20	/ /20	/ /20	/ /20	/ /20
Signature of physiotherapy faculty						

29	30	31				
<i>/ /20</i>	<i>/ /20</i>	<i>/ /20</i>				
Signature of physiother- apy faculty						

Total number of days =

Total number of days(present) =

Signature of HOD

Department of

Certificate of completion and assessment

Certify that Ms/Mr.....worked in the department of from to and satisfactorily completed the internship posting . The intern has been assessed as follows-

Sno	Attribute	Score given 0 to 5
1	Proficiency of knowledge required for clinical cases	
2	Competency of skills	
	A.Of self performance	
	B.Of having assisted in treatments	
	C.Of having observed	

3	Responsibility , punctuality, work up of case, involvment in treatment follow up reports.	
4	Capacity to work in a team (behaviour with colleague,nursing staff and realtion with other staff)	
5	Initiative, participation in discussions, research aptitude.	

List of Abbreviations

AED	Automated External Defibrillator
AHP	Allied and Healthcare Professional
BLS	Basic Life Support
BMW	Bio Medical Waste
B Sc	Bachelor of Science
BVMs	Bag Valve Masks
CATS	Credit Accumulation and Transfer System
CBCS	Choice-Based Credit System
CbD	Case-based Discussion
CBSE	Central Board of Secondary Education
CNS	Central Nervous System
CPR	Cardiopulmonary Resuscitation
CPU	Central Processing Unit
CR	Confidential Report
CVS	Cardio Vascular System
DOPs	Direct observation of procedures
ECTS	European Credit Transfer System
ESR	Erythrocyte Sedimentation Rate
HSSC	Healthcare Sector Skill Council
ICT	Information & Communication Technology
JCI	Joint Commission International
LAN	Local Area Network

M CEX	Mini Case Evaluation Exercise
MoHFW	Ministry of Health and Family Welfare
NABH	National Accreditation Board for Hospitals & Healthcare Providers
NCRC	National Curricula Review Committee
NIAHS	National Initiative for Allied and Healthcare Sciences
NSDA	National Skills Development Agency
NSQF	National Skills Qualification Framework
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
OSLER	Objective Structured Long Examination Record
PCV	Packed Cell Volume
PPE	Personal Protective Equipment
PG	Post Graduate
TSU	Technical Support Unit
UGC	University Grants Commission
UG	Under Graduate
UHC	Universal Health Coverage
WHO	World Health Organization
WWW	World Wide Web