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Competency Based Curriculum for Bachelor of Physiotherapy (BPT)

(with effect from 2026-2027 Batch onwards)

as per

National Commission for Allied and Healthcare Professions (NCAHP)

Amended as per AC-53/2026, Dated 21/04/2026

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सत्यमेव जयते

National Commission for Allied and Healthcare Professions

COMPETENCY BASED CURRICULUM

for

"PHYSIOTHERAPY"



As per the NCAHP Act -2021

APPROVED SYLLABUS

2025

Ministry of Health & Family Welfare

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NCAHP
Since-2021

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

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
राष्ट्रीय सहबद्ध और स्वास्थ्य देखभाल व्यवसाय आयोग
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Chapter 1:
Introduction to the Handbook

Chapter 1

1.0.: Introduction to the Handbook

1.0.1. The **National Physiotherapy Curriculum Handbook** is an up gradation and revision of the Model Curriculum Handbook on Physiotherapy by Ministry of Health and Family Welfare, Government of India that was published in 2017. On March 28, 2021, the National Commission for Allied and Healthcare Professions bill was passed by the Parliament of India and an Interim Commission was set up under the rules of the National Commission for Allied and Healthcare Profession (NCAHP) Act, notified by the central government on May 27, 2021.

1.0.2. 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 offering related courses, maintenance of a Central and State Register, creation of a system to improve access, research and development and adoption of latest scientific advancement and related matters , initiated the process of drafting the curricula for ensuring nationwide standardized education for allied and healthcare professions in phased manner, including that of Physiotherapy in phase I. .

1.0.3. This Physiotherapy Curriculum handbook aims to provide minimum standards for Physiotherapy ensuring standardized curriculum, career pathways, nomenclature, duration of programme and other related details. The curricula focus on competency-based approach in teaching, a transition from purely didactic approach, which will create competent and clinically skilled professionals leading to improved quality of services and patient care outcomes.

1.0.4. This handbook has been designed to familiarize the universities, colleges, healthcare providers as well as educators offering Physiotherapy courses with these national (minimum) standards.

1.1.: Who is a Healthcare Professional?

1.1.1. The National Commission for Allied and Healthcare Professions Act, 2021 (mentioned hereafter as the Commission) defines the healthcare professionals as:

1.1.2. 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 (3600) spread over a period of three years to six years divided into specific semesters/annual terms.

1.1.3. Since past several years, many professional groups have been interacting and seeking guidance on all those who would qualify under the purview of “healthcare professionals”. Wherein statutory regulatory bodies existed for clinicians, nurses, pharmacists and dental practitioners, regulatory mechanism for more than 50 professions was lacking in India. In view of the same, the National Commission for Allied and Healthcare Professions Act, 2021 was enacted by the Parliament of India, to enable regulatory provisions for 56 professions covered under the ambit of the allied and healthcare system.

1.1.4. The NCAHP Act identifies different professions based on the ILO's International Standard Classification of Occupations (ISCO-08) coding and WHO's standard documentation on classifying health workers. As per global classification, Physiotherapists with ISCO code of 2264 are healthcare professionals given their nature of duties and responsibilities for patient care and number of hours of training at entry level qualification that is Bachelor of Physiotherapy (BPT) which has been following a duration of 4.5 years including internship till now.

1.2.: Scope and need for Physiotherapy professionals in the Indian Healthcare system

1.2.1. 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 rapidly shifting to patient centric model with a multi-disciplinary team approach involving both clinicians and non- clinicians. As the country faces an increasing prevalence of chronic diseases, aging population, and rise in the life-style related ailments, the demand for rehabilitative and therapeutic services in surging. Physiotherapists play a crucial role in improving the quality of life for patients and are essential in promoting mobility, pain management, and functional independence, thereby also reducing the burden on medical and surgical treatments.

1.2.2. As the Indian government strives towards Universal Health Coverage and expansion of healthcare infrastructure including hospitals, clinics, wellness centres, academic institutions etc., physiotherapists have a major role to play and their expertise is vital in multi-disciplinary healthcare teams across different levels of healthcare delivery system contributing to comprehensive patient care. Many examples assert the need of skilled and competent physiotherapists in the system such as the National guidelines for prevention and management of stroke highlights the that physiotherapists significantly enhance management and early return to normal life for stroke survivors. The increasing awareness about the preventive healthcare and importance of physical well-being further amplifies the demand the Physiotherapy services in rural and urban settings alike. Several other examples include 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 chronic conditions such as diabetes people with neuropathic pain and amputees, and those suffering from other lifestyle 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:

1.2.2.1. Across the age span of human development from neonate to old age;

1.2.2.2. With patients having complex and challenging physical dysfunction/ problems resulting from systemic illnesses, diseases, disorders or trauma

1.2.2.3. Towards health promotion and disease prevention

1.2.2.4. Assessment, diagnosis, management and evaluation of interventions and protocols for treatment;

1.2.2.5. In a broad range of settings, from a patient's home to community, Healthcare facilities including those in the educational institutions and corporate/industrial set up, primary care centers, to tertiary care settings; and

1.2.2.6. With an understanding of the healthcare issues associated with diverse socio-economies and cultural norms within the society.

The detailed scope is mentioned in Chapter 8.

1.3. Learning goals and objectives for Physiotherapy professionals

The handbook has been designed with a focus on performance-based outcomes pertaining to different levels of education program. The learning goals and objectives of the undergraduate and post-graduate education program will be based on 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:

1.3.1. Independent Clinical Practice

1.3.2. Communication

1.3.3. Member of a multidisciplinary health team

1.3.4. Ethics and accountability at all levels (clinical, professional, personal and social)

1.3.5. Commitment to professional excellence

1.3.6. Leadership and mentorship

1.3.7. Social accountability and responsibility

1.3.8. Scientific attitude and scholarship (only at higher level-MPT and PhD)

1.3.9. Lifelong learning

1.3.1. 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:

1.3.1.1. Apply the principles of basic science and evidence-based practice

1.3.1.2. Develop competency for autonomous practice of Physiotherapy as first-hand practitioners.

1.3.1.3. Prescribe and use relevant investigations, therapeutic interventions, assistive devices, home and work place modifications, sup- port systems etc. as needed

1.3.1.4. Identify the indications of Physiotherapy for various disease, disorders and trauma and manage them in an appropriate manner with physiotherapeutic modalities.

1.3.1.5. Assessment of patients and identifying the need for appropriate referral to other medical specialties.

1.3.1.6. Provide care to patients – efficiently and in a cost-effective way – in a range of settings, and maintain foremost the interests of individual patients

1.3.1.7. Identify the influence of biological, psychosocial, economic, and spiritual factors on patients' well-being and act in an appropriate manner

1.3.1.8. Incorporate strategies for certain emergency care, health promotion and disease prevention with their patients

1.3.2. 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 Healthcare services. Program objectives should enable the students to:

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

1.3.2.2. 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

1.3.2.3. Explain the proposed healthcare service – its nature, purpose, possible positive and adverse consequences, its limitations, and reasonable alternatives wherever they exist

1.3.2.4. Use effective communication skills to gather data and share information including attentive listening, open-ended inquiry, empathy and clarification to ensure understanding

1.3.2.5. 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.

1.3.2.6. Use communication effectively and flexibly in a manner that is appropriate for the reader or listener

1.3.2.7. 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

1.3.2.8. Develop efficient methods for all forms of written and verbal communication including accurate and timely record keeping

1.3.2.9. Assess his/her own communication skills, develop self-awareness and be able to improve his/her relationships with others

1.3.2.10. Possess skills to counsel for lifestyle changes and advocate health promotion

1.3.3. Membership of a multidisciplinary health team[2]

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 Healthcare 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:

1.3.3.1. Recognise, clearly articulate, understand and support shared goals in the team that reflect patient and family priorities

1.3.3.2. 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

1.3.3.3. Develop mutual trust within the team to create strong norms of reciprocity and greater opportunities for shared achievement

1.3.3.4. Communicate effectively so that the team prioritises and continuously refines its communication channels creating an environment of general and specific understanding

1.3.3.5. 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.

1.3.4. 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:

1.3.4.1. Describe and apply the basic concepts of clinical ethics to actual cases and situations

1.3.4.2. Recognise the need to make Healthcare resources available to patients fairly, equitably and without bias, discrimination or undue influence

1.3.4.3. Demonstrate an understanding and application of basic legal concepts to the practice of Physiotherapy

1.3.4.4. Employ professional accountability for the initiation, maintenance and termination of patient-care provider relationships

1.3.4.5. Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

1.3.5. Commitment to professional excellence[3]

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:

1.3.5.1. 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

1.3.5.2. Demonstrate the quality of being answerable for all actions and omissions to all, including service users, peers, employers, standard-setting/regulatory bodies or oneself

1.3.5.3. Demonstrate humanity in the course of everyday practice by virtue of having respect (and dignity), compassion, empathy, honour and integrity

1.3.5.4. Ensure that self-interest does not influence actions or omissions, and demonstrate regards for service-users and colleagues

1.3.6. Leadership and mentorship[4]

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 them- selves 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:

1.3.6.1. 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

1.3.6.2. 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

1.3.6.3. Identify priorities and effectively manage time and resources to ensure the maintenance or enhancement of the quality of care

1.3.6.4. 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)

1.3.6.5. Facilitate themselves and others in the development of their competence, by using a range of professional and personal development skills

1.3.6.6. 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' contributions to integrated person-centered care; yet work in an effective manner across professional and agency boundaries. They must know when and how to communicate with patients, 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.

1.3.7. Social Accountability and Responsibility[5]

The students will recognise that the healthcare professionals need to be advocates within the Healthcare 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:

1.3.7.1. Demonstrate knowledge of the determinants of health at local, regional and national levels and respond to the population' health needs

1.3.7.2. 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

1.3.7.3. Develop a shared vision of an evolving and sustainable Healthcare 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.

1.3.7.4. Advocate for the services and resources needed for optimal patient care

1.3.8. Scientific attitude and Scholarship[10]

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:

1.3.8.1. Engage in ongoing self-assessment and structure their continuing professional education to address the specific needs of the population

1.3.8.2. Practice evidence-based practice by applying principles of scientific methods

1.3.8.3. Takes responsibility for their educational experiences

1.3.8.4. Acquire basic skills such as presentation skills, giving feedback, patient education and the design & dissemination of research knowledge; for their application to teaching encounters.

1.3.8.5. Develop a research question and be familiar with basic, clinical and translational research in its application to patient care

1.3.9. 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:

1.3.9.1. Perform objective self-assessments of their knowledge and skills; learn and refine existing skills; and acquire new skills

1.3.9.2. Apply newly gained knowledge or skills to patient care

1.3.9.3. Enhance their personal and professional growth and learning by constant introspection, mentor's guidance and by utilizing experiences

1.3.9.4. Search (including through electronic means), and critically evaluate medical literature to enable its application to patient care

1.3.9.5. Identify and select an appropriate, professionally rewarding and personally fulfilling career pathway.

1.4. Introduction of new elements in Physiotherapy Competency-based curriculum

1.4.1. 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 health- care 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'.**

1.4.2. 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.

1.4.3. A competency- based program is a mix of skills and competencies based on individual or population needs (such as clinical knowledge, patient care, or communication approaches), which is then developed to teach relevant content across a range of courses and settings. While the traditional system of education focuses on objectives, content, teacher-centric approach and summative evaluation; competency-based education has a focus on competencies, outcomes, performance and accomplishments. In such a case, teaching activities are learner centeric, and evaluation is continuous and formative in structure. The 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

1.4.4. Considering the need of the present and future healthcare delivery system, the curriculum design depicted in this handbook thus will **be based on skills and competencies**. The highlights of Curriculum include:

1.4.4.1. Promoting self-directed learning of the professionals

i. 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 longer 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.**

ii. *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]

iii. 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.

1.4.4.2. Credit hours vs. traditional system

i. The University Grants Commission (UGC) have highlighted the need for the development of a Choice-Based Credit System (CBCS), at par with global standards and the adoption of an effective grading system to measure a learner's performance.[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]

ii. 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 (NCrF) where[1]:

   a. Theory (classroom teaching) 1 credit is equal to 15 hours,

   b. Practical/Clinical – 1 credit is equal to 30 hours

   c. Experiential learning (field work) – 1 credit is equal to 45 hours

iii. The NCrF applies to credits given to students and will bear the above structure. However, the workload for academicians/ teachers should be counted at actual number of hours devoted for imparting/conducting the "Lectures/tutorials/practical/seminars/ OPD/clinical training/research and any such curricular/ extra-curricular activity".

[1] https://www.ugc.gov.in/pdfnews/9028476_Report-of-National-Credit-Framework.pdf

1.4.4.3. Integrated structure of the curriculum

i. 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).

ii. 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.

iii. 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]

iv. 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 and practice, and between hospital-based practice and community practice. The amount of time devoted to basic and laboratory sciences (integrated with their clinical relevance) would be the maximum in the first year, progressively decreasing in the second, third and fourth year of the training, making clinical exposure and learning more dominant.[11]

1.4.4.4. Learning methodologies

i. 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.

ii. Introduction of foundation course in the curriculum

   a. The foundation course for healthcare professions is an immersive program designed to impart the required knowledge, skills and confidence of a professional healthcare course. 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 has been provided in terms of – modifying the required numbers of hours for each foundation subject and appropriate placement of the subject throughout the program.

   b. 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 in 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. With the advancement of technology, new teaching tools are being used such as skill centres with mannequins, laboratories and high-fidelity simulation laboratories using scenarios to enhance the practice and training for the students and healthcare professionals. The use of simulators addresses many issues such as suboptimal use of resources and equipment by adequately training the students on newer technologies, limitations of imparting practical training in real-life scenarios, and ineffective skills and competence assessment methods, among others. Further, new technology and techniques are being put into practice by several institutions that include Flipped classrooms, Online and blended learning, use of Learning Management Systems, among others.

c. The table 1.1 mentioned below lists various modes of teaching and learning opportunities that harness advanced tools and technologies.

Table 1.1. Clinical learning opportunities imparted through the use of advanced teaching techniques

Teaching modality	Learning opportunity examples
i.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 Physio-therapeutic modalities and therapeutic exercises
	Receive feedback on performance
ii.Mannequins	Perform acquired techniques
	Practice basic procedural skills
	Apply bassic science understanding to clinical resolutions.
iii.Simulators	Practice teamwork and leadership
	Perform cardiac and pulmonary care skills
	Apply basic science understanding to clinical problem solving
iv.Task-under-supervision	Learn assessment, investigations, diagnosis, and physiotherapeutic interventions including but not limited to - application of exercise therapy and 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.

1.4.4.5. Assessment methods

i. 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.**

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

   a. Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OSPE), Objective Structured Long Examination Record (OSLER)

   b. Mini Case Evaluation Exercise (CEX)

   c. Case-based discussion (CBD)

   d. Direct observation of procedures (DOPs)

   e. Portfolio

   f. Multi-source feedback

   g. Patient satisfaction questionnaire

iii. 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 and functional diagnosis, procedures, prescriptions and patient management. 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 frequent assessment of learning outcomes. Hence, it is imperative for teachers to be aware of these developments and they should suitably adopt them in the Physiotherapy education system.

Chapter 2
Methodology of Curriculum Development

Chapter 2:

2.0. Methodology of curriculum development

2.0.1. Interim Commission for Allied and Healthcare Professions constituted three committees to streamline the standardisation of education, practice and development of allied and healthcare professions. Committee three was given the mandate to set curricula standards of allied and healthcare professions in phased manner. A model curriculum handbook for Physiotherapy was developed and published by Ministry of Health and Family Welfare in the year 2017, with a view to have uniform standard for undergraduate and postgraduate Physiotherapy education in India. This handbook served as baseline for upgradation and revision considering technological advancements, changing industry needs, incorporation of new knowledge and evidence-based practice, and to match the global standards in field of Physiotherapy education and practice.

2.0.1.1. **Constitution of Physiotherapy Task force committee:** The Commission sought opinion of the professional experts in the field of academics, practice and research from leading government and private institutions across India, to constitute a task force committee for Physiotherapy. Experts were identified and taskforce was notified by the Ministry of Health and Family Welfare (2022-2023). These subject experts redesigned the curricula based on a standardized framework.

2.0.1.2. **Common guidelines:** The Commission issued guidelines and framework for developing curricula, common to all the allied and healthcare profession and for the task force committee to revise and recommend the updated norms regarding education and practice of Physiotherapy in India.

2.0.1.3. **Taskforce meetings:** 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.

2.0.1.4. **Literature review:** 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 attained amongst the task force committee members on various suggestions by the members and literature review.

2.0.1.5. **Public opinion:** was solicited on public platform for 15 days through which more than 2300 comments were received, reviewed and incorporated appropriately as per the recommendations of the Taskforce members.

2.0.2. 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 standardization of Physiotherapy education in India.2.0.3.

Chapter 3
Background of the Profession

Chapter 3: Background of the profession

3.0. Statement of Philosophy– Why this profession holds so much importance[14]

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

3.0.2. Physiotherapists constitute essential part of the Primary care services; wherein primary care refers to the work of health professionals who act as a first point of consultation for all patients within the healthcare system. Such a professional would usually be a primary care physician, such as a general practitioner or family physician, a licensed practitioner such as a physiotherapist, or a non-physician primary care provider such as a mid-level healthcare provider. Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

3.0.3. 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.

3.0.4. Physiotherapists 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.

3.0.5. Physiotherapists are healthcare 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 its functioning with specialised hands-on clinical skills to assess, diagnose and treat physical dysfunctions due to disorders, illness, injury/trauma or disabilities.

3.0.6. 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. The minimum education requirement is a baccalaureate degree in Physiotherapy.

3.0.7. Physiotherapy is an essential part of the health and community/welfare services delivery system.

3.0.8. Physiotherapists practice independently and also as part of the multidisciplinary rehabilitation/ habilitation team; they 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 assessment, evaluation and investigations.

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

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

3.0.9.2. 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.

3.0.9.3. Assessing/evaluating, prescribing necessary investigations to establish diagnosis for physical dysfunction, prescribing physiotherapeutic interventions/treatment plan to the patients/ individuals seeking opinion/guidance regarding their health issues

3.0.9.4. 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 diseases, disorders and trauma.

3.0.9.5. 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.

3.1. Practice settings for Physiotherapists

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/ establishments that may include, but are not confined to, the following:

i. Hospitals (of different levels across public and private sector)

ii. Physiotherapy private clinics

iii. Nursing homes

iv. Occupational health centers

v. Out-patient clinics

vi. Home based care

vii. Sports centres/clubs

viii. Fitness clubs, health clubs, gymnasia and wellness centre

ix. Special schools and care centres

x. Senior citizen centres

xi. Community based rehabilitation facilities/ disaster management and relief centres

xii. Hospices/ Palliative care centres (terminal care centres)

xiii. Prisons

xiv. Public settings (e.g., shopping malls) for health promotion

xv. Workplaces/companies/ corporate settings

xvi. Integrated medical centres

xvii. Women's health centre

xviii. Research centres

3.2. Recognition of Title and Qualification

3.2.1. Within the multidisciplinary health professionals' team, the professional responsible for administrating 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.

3.2.2. The Commission recognizes any Healthcare professional as Physiotherapist who has acquired Bachelor of Physiotherapy from recognized university/College as per the regulations of the Commission.

3.2.3. The recommended title thus stands as the "Physiotherapist" with the Prefix "Dr" and suffix "PT".

3.2.4. 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.

3.2.5. The table 3.1, 3.2 and 3.3 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. The tables also indicate the corresponding level of qualification with experience required by the professional to fulfill the requirements of each level.

3.2.5.1. 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 only bachelor's and master's degree courses. In the academic front, to work at the position of a Lecturer/Assistant Professor the candidate must attain Master's degree.

Table 3.1 Nomenclature based on clinical career progression for Physiotherapist

Sector	Progression from Entry level	Eligibility and Experience		Annual Performance based appraisal
	Designation	**Direct recruitment**	**Promotion**	
Clinical	**i. Clinical Physiotherapist**	Fresh BPT graduate	Fresh BPT graduate	As they will work in the same position for next three years and they will need to have performance appraisals
	ii. Senior Clinical Physiotherapist	Three years of clinical experience	Three years of clinical experience	Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year
	iii. Superintendent Physiotherapist	Five years' of clinical experience with MPT qualification desirable	Five years' experience in the post of senior physiotherapist MPT is desirable for promotion	Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year Attended Two National / International conferences.
	iv. Chief Physiotherapist	Eight years' experience as Superintendent Physiotherapist. MPT IS Mandatory	Eight years' experience as Superintendent Physiotherapist. MPT IS Mandatory	Proficiency test CR & Self-appraisal/ year Attended Two National / International conferences
	v. Director Physiotherapy/Head of the Physiotherapy Department*	Five years' experience as Chief Physiotherapist. MPT IS Mandatory	Five years' experience as Chief Physiotherapist. MPT IS Mandatory	Proficiency test CR, Self appraisal/ year. Three national / International Conference.
	vi. Assistant Director General [A.D.G]	Five years of clinical experience as Director PT. MPT IS Mandatory	2 years' experience as Director PT. MPT IS Mandatory	Proficiency test CR, Self appraisal/ year Five National / International Conferences

Table 3.2 Nomenclature based on academic career progression for Physiotherapist

Sector	Progression from Entry level	Eligibility and Experience		Annual Performance based appraisal
	Designation	Direct recruitment	Promotion	
Academic	**i. Assistant Professor**	Fresh MPT graduate	Fresh MPT graduate	As they will work in the same position for next three years and they will need to have performance appraisals
	ii. Assistant Professor (Senior)	Three years' of experience as Assistant professor Ph.D.*** is desirable for promotion/ direct recruitment to Assistant Professor (Senior grade)	Three years' of experience as Assistant professor Ph.D.*** is desirable for promotion/ direct recruitment to Assistant Professor (Senior grade)	Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year Two Conference presentation as Asst. Professor Junior. Two publications during tenure period as Asst. Professor Junior Enrollment for PhD. (For Academics)
	iii. Associate Professor	Total Five years of experience as Assistant Professor (out of which minimum 2 yrs as Senior AP preferabely) PhD is Mandatory	Total Five years of experience as Assistant Professor (out of which minimum 2 yrs as Senior AP preferabely) PhD is Mandatory	Proficiency test CR & Self-appraisal/ year Two Conference presentation as asst. Prof. Senior Three Publications (as first author) asst. Prof. Senior
	iv. Professor	Five years of experience as Associate Professor or Total 13 years of teaching experience. PhD is Mandatory	Five years of experience as Associate Professor or Total 13 years of teaching experience. Senior most Professor will be the Principal/Dean PhD is Mandatory.	Proficiency test CR, Self appraisal/ year Three Conference presentations as Associate Professor Three publications (as first author) Associate Professor

Sector	Progression from Entry level	Eligibility and Experience		Annual Performance based appraisal
	Designation	Direct recruitment	Promotion	
	v. Dean	Five years of experience as Professor PhD is Mandatory	Five years' experience as Professor, Senior most Professor will be the Principal/Dean PhD is Mandatory	Proficiency test CR, Self appraisal/ year Five Conference presentations as Professor. Five publications (as first author) as Professor

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Table 3.3 Nomenclature based on research career progression for Physiotherapist

Sector	Progression from Entry level	Eligibility and Experience		Annual Performance based appraisal
	Designation	Direct recruitment	Promotion	
Research	**i. Scientist -C**	MPT, Ph D	MPT, Ph D	Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year One Conference presentation One publication during tenure period
	ii. Scientist D	Five years of research experience as Scientist C.	Five years of research experience as Scientist C.	Proficiency test CR, self-appraisal & HOD/Principal's Appraisal/year Two Conference presentation as scientist C. Two publications during tenure period as scientist C.
	iii. Scientist E	Eight years of experience as Scientist D	Eight years of experience as Scientist D	Proficiency test CR & Self-appraisal/ year Two Conference presentation as Scientist D Three Publications (as first author) as Scientist D.
	iv. Scientist F	Five years of experience as Scientist E	Five years of experience as Scientist E	Proficiency test CR, Self appraisal/ year. Three Conference presentations as Scientist E Three publications (as first author) as Scientist E.
	v. Scientist G/ Research Head	Five years of experience as Scientist F	Five years of experience as Scientist F (Designation as per UGC / ICMR Norms) Scientist D	Proficiency test CR, Self appraisal/ year Five Conference presentations as Scientist F Five publications (as first author) as Scientist F

** For hospitals/ universities having department of physiotherapy*

*** Pay scales for Clinical, research and academic designations will be same at different levels. E.g. Pay scale of Senior Physio- therapist (Clinical), Assistant Professor (Academic) and Scientist C (Research) at the same level, will be the same.*

**** Ph. D. under any specialty/ discipline in Physiotherapy Only.*

3.2.5.2. **A minimum of 55 % marks in MPT examinations is required for taking Academic Designation or research designation. A relaxation of 5% may be provided at the graduate and master's level for the Scheduled Caste/ Scheduled Tribe/OBC/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.**

3.2.5.3. Mandatory Ph.D. will be applicable after five years of implementation of these Rules where ever mentioned in the Tables-3.1,3.2,3.3.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.

3.2.5.4. 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.

3.2.5.5. All teaching staff will engage in clinical practice at the attached hospitals/OPD, assuming dual responsibilities. Their workload will be calculated accordingly, with hours spent in clinical settings considered equivalent to theory hours.

3.2.5.6. As a part of conflict of interest, no teaching faculty of college is allowed to be affiliated directly or indirectly with private clinic/ as workshops liaison.

3.2.5.7. As a part of conflict of interest, Clinician (working on Clinical Post) are not allowed to be affiliated directly or indirectly with private clinic/as workshops liaison.

3.2.5.8. It is mandatory for all teaching faculties to attend "Faculty Development programme" every three years. **The certificate of the same to be uploaded on state council website.**

3.2.5.9. Physiotherapists on clinical posts who impart and are responsible for clinical training and supervision of physiotherapy students/ interns will be provided with academic experience by the Dean /Principal of the respective recognized Physiotherapy College will only be Valid.

3.3. Definition of Physiotherapist and ISCO of Physiotherapy

3.3.1. Physiotherapist is a professional 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.

3.3.2. 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)

3.3.3. The International Standard Classification of Occupations (ISCO) given by the International Labour Organisation (ILO) is 2264**.**

3.4. Education of the Physiotherapist

When developing any education program, it is necessary that program planning should be outcome-based, meeting local and national workforce requirements, ensuring 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 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.

3.4.1. **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 subjects including Physics, Chemistry, Biology (Min 50% marks) from a recognized university or board. Admission shall be on the basis of the **candidate having appeared for the National Eligibility Entrance Test (NEET)**.

3.4.2. **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 -

i. **5 years program (including one year of internship) - Bachelor's Degree level:** The emphasis should be on the academic content establishing a strong scientific basis and on the application of theory to clinical/reflective practice. In Bachelor's 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 healthcare practitioner as well as a key member of the multidisciplinary team and to enable him/her to execute advanced diagnosis, preparation/planning/designing/delivery of Physiotherapy treatment as well as quality assurance.

ii. **Master's Degree level** : 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. A Master's degree program is recommended with a minimum of two years of education in specialized field of Physiotherapy. The post graduate students are expected to contribute significantly to research and academics.

iii. **Ph.D.:** A PhD program is recommended with 3.5 to five years of research work in an elective field of choice. PhD also play a significant role in the clinical, research and academic systems of Physiotherapy.

3.4.3. **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 education is mandatory requirement to maintain a standard of teaching and 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 as per the norms prescribed in this Regulation.

3.4.3.1. **Bachelor in Physiotherapy (B.P.T) program**

i. **Infrastructural, Functional & Equipment and human resource Requirements as per Annexure -2**

ii. **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:

a. A Central/ State Government/Union territory;

b. A University and Deemed to be University, or a private institution affiliated with a Government university;

c. An autonomous body of the Central or State Government;

d. A society registered under the Societies Registration Act, 1860 (21 of 1860) or corresponding Acts in States;

e. A public or charitable trust registered under the Trust Act, 1882 (2 of 1882);

f. Companies registered under Company Act may also be allowed to open Physiotherapy colleges.

iii. New Physiotherapy College/institute can be established preferably in colocation with a medical college recognized by the National Medical Commission (NMC). **Notwithstanding, a new Physiotherapy College needs to fulfil the entire essential requirement as prescribed by the norms in this Regulation.** The new Physiotherapy College may share common facilities, faculties and infrastructure with the medical college where feasible/ applicable.

iv. Note: All existing physiotherapy colleges/ institute or a new physiotherapy college will impart physiotherapy education provided that **conditions mentioned in Annexure -2** are fulfilled.

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Chapter 4
Curriculum
Bachelor of Physiotherapy
(5 years program)

4.0. Bachelor of Physiotherapy : Curriculum Background

4.0.1. 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.

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

i. Technically and clinically competent for independent decision making;

ii. Competent to assess a patient;

iii. Aware of patient conditions and treatment along with the importance of quality assurance;

iv. Understand the theoretical basis for evidence-based practice;

v. Effective members of the multidisciplinary team;

vi. Prepared to participate in or initiate research into practice;

4.0.3. 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.

4.0.4. 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 as a healthcare professional.

4.1. Introduction to Bachelor of Physiotherapy Curriculum:

4.1.1. **Program outcomes**

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

i. Demonstrate competencies to provide quality care to the individuals and populations to optimize their movement, function, and quality of life.

ii. Demonstrate competency to examine, assess, evaluate, treat and prescribe physiotherapeutic management of various disease, disorders and trauma conditions.

iii. 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.

iv. Demonstrate the commitment to provide ethical care through high standards of professional practice.

v. Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships.

vi. Demonstrate competency to prescribe and comprehend various diagnostic imaging, electrophysiological, hematological and bio- chemistry investigations for proper diagnosis, treatment or referral to other healthcare professionals

vii. Demonstrate competencies to integrate best available research evidence in to clinical decision making and practice

viii. Exhibits commitment towards continuous learning and scholarly activities.

ix. Demonstrate abilities to work effectively with Healthcare team in providing patient centered care.

x. Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services.

xi. Demonstrate competencies in quality assurance relevant to Physiotherapy practice.

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

i. 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.

ii. Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.

iii. Able to operate and maintain Physiotherapy equipment used in treatment of patient, Physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.

iv. Able to provide patient education about promotion of health, prevention of disease and disorders and various physiotherapeutic interventions to the patient and care givers.

v. Able to demonstrate all competencies to achieve the program outcomes.

4.2. Expectations from the future Physiotherapy graduates

4.2.1. The graduate will be a competent, skilled and reflective Physiotherapy practitioner who can work in a variety of 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.

4.2.2. The graduate will utilize critical inquiry and evidence-based practice to make clinical decisions essential for autonomous practice.

4.2.3. 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.

4.2.4. The graduate will demonstrate lifelong commitment to learning and professional development.

4.2.5. The graduate will adopt and adapt innovations, technology, research and critical thinking to keep pace with scientific advancements in Physiotherapy and associated fields.

4.2.6. The graduate will function as active member in trans-disciplinary and multidisciplinary applications

4.2.7. Coursework entitles independent Physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates

4.2.8. Course work will skill the graduate's physical/ functional diagnosis, treatment planning and management, administration of Physiotherapy treatment and for patient support.

4.2.9. 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.

4.2.10. Physiotherapy graduates are encouraged to pursue further qualification to attain senior positions 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 institute.

Table 4.1: Intended Program Outcomes and Broader Compentencies for Physiotherapists in diverse roles

Role/Domain	Intended Program Outcomes	Broader Competencies
I. Clinician / Physiotherapy Practitioner	Demonstrate competencies to provide quality care to 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.	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 physio- therapeutic interventions. 3. Prescribe physiotherapeutic modalities, therapeutic exercises, assistive devices, aid, appliances, support systems and home modifications 4. Prescribe and comprehend various diagnostic imaging, electro- physiological, hematological and biochemistry investigations for proper diagnosis and physiotherapeutic treatment 5. Design, implement, evaluate, and monitor patient-centered physio- therapy care based on the available evidence. 6. Involves patients, care givers, and related healthcare providers in holistic 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.
II. Ethical and professional practitioner	Demonstrate the commitment to provide ethical care through high standards of professional practice.	1. Incorporates legal and ethical standards into 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.
III. Communicator	Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships	1. Communicate effectively with colleagues, patients, Healthcare providers and other stakeholders. 2. Demonstrate ability to document Physiotherapy assessment, plan of care, protocol modification, and evaluation as per the prescribed standards.

Role/Domain	Intended Program Outcomes	Broader Competencies
IV. Evidence-based practitioner and lifelong learner	Demonstrate competencies to integrate best available research evidence into clinical decision making and practice. Exhibits commitment towards continuous learning and scholarly activities.	1. Demonstrates competencies in acquiring, appraising, and applying research evidence. 2. Identifies need for continuing professional development.
V. Inter-professional teamwork	Demonstrate abilities to work effectively with Healthcare team in providing patient centred care	1. Contribute to effective team- work through comprehensive, collaborative, consultative, culturally responsive, and patient centred model of practice. 2. Demonstrate competencies for appropriate referral to other medical and Healthcare professionals
VI. Leader and Manager	Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services.	
VII. Quality assurance	Demonstrate competencies in quality assurance relevant to physio- therapy practice	1. Demonstrate knowledge in quality policies, procedures, process, and standards.

4.3. Eligibility for admission:

4.3.1. Selection Procedure:

4.3.1.1. He/she must have passed the Higher Secondary (10+2) or equivalent examination by recognised any Indian board or a duly constituted Board or National Open School with pass marks with minimum 50% in aggregate of physics, chemistry and biology (botany & zoology),

4.3.1.2. No candidate will be admitted on any ground unless he/she has appeared in the NEET examination.

4.3.1.3. Admission to Bachelor of Physiotherapy program shall be made on the basis of eligibility (minimum 50% with physics, chemistry and biology) and merit list based on 10+2 passing marks.

4.3.1.4. Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities and Equivalence Committee of the NCAHP, and must fulfil the criteria as per points 1-3 above.

4.3.1.5. He/she should have attained the age of 17 years as on - current year, as on the date of admission.

4.3.1.6. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from an Authorized Medical Attendant to ascertain that the candidate does not have any physical disability as per the guideline mentioned below

4.3.1.7. As per the Eligibility criteria described in Table 4.2, candidate can take admission on disability quota for BPT program .

i. Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in BPT Course

a. **Note:** The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (Divyangjan)] on 15th June 2017.

b. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (Divyangjan)] on 4th January 2018.

c. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.

d. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

e. Quota/ reservation policy as per the State Government norms to be followed by the State Council as applicable during allotment of seats

f. 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.

Table 4.2: Eligibility criteria for 'Persons with Disabilities' (PwD) for admission to B.P.T.

Sr. No.	Disability Type	Benchmark Disabilities	Specified Disability	Eligible for Physiotherapy Course, Not Eligible for PH Quota	Eligible for Physiotherapy Course, Eligible for PH Quota	Not Eligible for Physiotherapy
1.	Physical Disabilities	A.Locomotor Disability including Condition (a-f)	a. Leprosy* cured person b. Cerebral Palsy** c. Dwarfism d. Muscular Dystrophy e. Acid attack victim f. Others*** such as Amputation, Poliomyelitis, etc.	Less than 40% disability	1. Lower Limb: 40-50% disability 2. Spine: 40-50% disability 3. Limbs &/Spine: 40-50% disability	• More than 50% for Lower Limb • Involvement of both Upper Limbs • Involvement of dominant Upper Limb • Involvement of Non-dominant Upper Limb • More than 50% for Spine • More than 50% for Combined for Limbs and spine
		* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at. ** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at. *** Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for **BPT** course.				
		B.Visual Impairment (*)	a. Blindness b. Low vision	Less than 40% disability (i.e. Category '0(10%)', 'i(20%)' & 'ii(10%)	-	Equal to or More than 40% Disability Category till and above
		C.Hearing Impairment@	a. Deaf b. Hard of hearing	Less than 40% Disability	-	Equal to or more than 40% Disability

		(*) Persons with Visual impairment / visual disability of more than 40% may be made eligible to pursue BPT Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc. @ Persons with hearing disability of more than 40% may be made eligible to pursue BPT Course and may be given reservation, subject to the condition that the hearing disability is brought to a level of less than the benchmark of 40% with the aid of assistive devices. In addition to this, the individual should have a speech discrimination score of more than 60%.				
		D.Speech & language disability$	a. Organic/ neurological causes	Less than 40% Disability	-	Equal to or more than 40% Disability
		$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue BPT Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below. Persons with Aphasia shall be eligible to pursue BPT Courses, provided Aphasia Quotient (AQ) is 40% or below.				
2.	Intellectual disability		a. Specific learning disability (Perceptual disability, Dyslexia, Dyscalculia, Dyspraxia & Developmental aphasia)#	# Currently there is no Quantification scale available to assess the severity of SpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.		
				Less than 40% Disability	Equal to or more than 40% disability and equal to or less than 50%. But selection will be based on the learning competency evaluated with the help of the remediation/ assisted technology/ aids/ infrastructural changes by the Expert Panel.	More than 50% or severe nature or significant cognitive/ intellectual disability.

			b).Autism spectrum disorders	Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for BPT course by an expert panel.	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive /intellectual disability and / or if the person is unfit for pursuing BPT course by an expert panel.
3.	Mental Behaviour		Mental illness	Absence or Mild Disability: less than 40% (under IDEAS)	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	Equal to or more than 40% disability or if the person is unfit to perform his/her duties. Standards may be drafted for the definition of "fitness to practice medicine", as are used by several institutions of countries other than India.
4.	Disability caused due to	a. Chronic Neurological Conditions	i. Multiple Sclerosis	Less than 40% Disability	40-50% disability	More than 50%
			ii. Parkinsonism			
		b. Blood Disorder	i. Hemophilia	Less than 40% Disability	40-50% disability	More than 50%
			ii. Thalassemia			
			iii. Sickle cell disease			

5.	Multiple disabilities including deaf blindness		More than one of the above specified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India a+ [b(90-a)/90] (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual.

4.4. Duration of the course:

4.4.1. **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

4.4.2. Internship program**:** 01-year full time rotatory internship program.

4.5. Medium of instruction:

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

4.6. 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. Additionally, technology, hybrid or virtual learning, use of advanced learning tools, mannequins, simulators, videos can be utilized for enhancing learning experience.

4.7. Attendance:

i. A candidate has to secure minimum-

   a. 75% attendance in theory subjects.

   b. 85% in Skills training (practical) for qualifying to appear for the final examination.

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

4.8. Assessment:

4.8.1. The Continuous Internal Assessment (CIA) forms the Formative Assessment component of the evaluation system while the end year ex- amination as explained along with the formative assessment will become the summative assessment

4.8.2. 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.

4.8.3. Each paper shall have 20% Internal Assessment and 80% marks for University/External Examination. The internal assessment weightage will be based on following criteria depicted in Table 4.3:

Table 4.3: The internal assessment weightage criteria

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

4.9. Commencement of the course -

The course shall commence not later than 1st September of an academic year

4.10. Commencement of examination -

University examinations 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 examination in an academic year.

Resolution No. 5.15 of Academic Council (AC-53/2026): Resolved to approve the proposal to conduct the supplementary examination within 40 to 60 days after the declaration of the annual examination results for the BPT programme under the NCAHP curriculum , to be implemented from the Academic Year 2026-2027 onwards for both campuses.

4.11. Promotion criteria

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

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

4.11.3. Only after passing all the subjects of all the four years, he/she will be allowed to undergo internship.

4.12. Review of answer papers of failed candidates -

As per the regulations prescribed for review of answer papers by the Commission/ University.

4.13. Re-admission after break of study -

4.13.1. 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

4.13.2. 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

4.13.3. Candidates having a 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.

4.13.4. All re admissions of candidates are subject to the approval of a duly empowered committee of university constituted by the Vice Chancellor.

4.13.5. The candidates having a break of study of 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.

4.14. Maximum duration of the program -

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

4.14.2. **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 of ten years 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 two years duration, such cases will be placed before a committee to be constituted by the State Council for making appropriate decision on a case-to-case basis, based on individual merits.

3. "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."

4.15. Migration/transfer of candidates –

Migration/transfers of candidates up to second year is allowed between government college to government college. For private colleges Migration/transfers shall be done as per the norms of the concerned University.

4.16. 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. The period(s) of vacation can be decided by the Head of the Institution/University.

4.17. Internship -

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

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

4.17.3. During the period of internships, stipend amount must be paid to the students by the institute as prescribed by the State Council.

4.17.4. Up to 4 months of the internship duration can be completed as externship in an institute approved by the State Council.

4.17.5. Completion of Basic Life Support (BLS) program is mandatory for every student during the one year of internship. The concerned institute shall be responsible for organizing the BLS program to be guided by certified instructors for their students.

4.17.6. Two months of rural posting and preferably in a government setting like a CHC/ PHC/ Rural Rehabilitation Centres, shall be coordinated by the State Council for each student as a part of the Internship.

4.17.7. At the end of the Internship, a log book as prescribed in the Curriculum, duly signed by the Principal of the concerned Institute, must be preserved in the Institute.

4.18. Classification of successful candidates -

A successful candidate

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

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

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

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

4.19. Scheme of examination

4.19.1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than two internal assessment examinations, their weightage is as shown in Table 4.4.

Table 4.4: Weightage of the Internal and External Exams

Year	Internal exam 20% weightage	Final 80 % weightage
Ist year	Internal 1	University exam 1
	Internal 2	
2nd year	Internal 1	University exam 2
	Internal 2	
3rd year	Internal 1	University exam 3
	Internal 2	
4th year	Internal 1	University exam 4
	Internal 2	

4.19.2. Learners must secure at least 50% 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.

4.19.3. The results of Internal Assessment should be displayed on the notice board within a 1-2 week of the test. Summative assessment consists of university examinations.

Resolution No. 5.14 of Academic Council (AC-53/2026): Resolved to approve the proposed examination scheme and Continuous Internal Assessment (CIA) scheme including restructuring of marks distribution and assessment components in alignment with NCAHP guidelines. The approved scheme will be implemented for the BPT First Year programme from the Academic Year 2026-2027 onwards for both campuses [ANNEXURE-54].

ANNEXURE-3

Item No. 5: Proposal for approval of the assessment scheme for examinations for the first year BPT program

Annexure-54 of AC-53/2026

Generalized University and Internal Theory Examination Scheme

Pattern	Scheme for subjects with 80 marks University exam				CIA
	Human Anatomy, Human Physiology, Fundamentals of exercise modalities, Fundamentals of Electro Physical Agents, Fundamentals of Healthcare delivery System in India.		*Psychology & Sociology*		
	Section I	**Section II**	**Section I (Psychology)**	**Section II(Sociology)**	
LAQ	2 x 10 = 20 (Any 2 out of 3)	1 x 15 = 15 (Any 1 out of 2)	NIL	NIL	NIL
SAQ	2 x 05 = 10(Any 2 out of 3)	3 x 05 = 15 (Any 3 out of 4)	5 x 05 = 25 (Any 5 out of 6)	5 x 05 = 25 (Any 5 out of 6)	NIL
VSAQ	5 x 02 = 10(Any 5 out of 6)	NIL	5 x 02 = 10 (Any 5 out of 6)	5 x 02 = 10 (Any 5 out of 6)	NIL
MCQ	NIL	MCQ 1X 10 = 10	MCQ 1X 5 = 5	MCQ 1X 5 = 5	NIL
Written Assignments / Project work / Seminar, etc.	NIL	NIL	NIL	NIL	20
Illustration / VSAQ	NIL	NIL	NIL	NIL	20
Total	40	40	40	40	40
Grand Total	**80**		**80**		**40**

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ANNEXURE-3

Item No. 5: Proposal for approval of the assessment scheme for examinations for the first year BPT program

Generalized University and Internal Theory Examination Scheme

Pattern	Scheme for subjects with 40 marks University exam	CIA
	Biochemistry	
	Section I	
LAQ	NIL	NIL
SAQ	5 x 05 = 25 (Any 5 out of 6)	NIL
VSAQ	5 x 02 = 10 (Any 5 out of 6)	NIL
MCQ	MCQ 1X 5 = 5	NIL
Written Assignments / Project work / Seminar, etc.	NIL	10
Illustration / VSAQ	NIL	10
Total	40	20
Grand Total	**40**	**20**

Pattern	Scheme for NUE subjects exam of 40 marks
	NUE Subjects*: English, Information Technology
	Section I
LAQ	NIL
SAQ	5 x 05 = 25 (Any 5 out of 6)
VSAQ	5 x 02 = 10 (Any 5 out of 6)
MCQ	MCQ 1X 5 = 5
Written Assignments / Project work / Seminar, etc.	NIL
Illustration / VSAQ	NIL
Total	40
Grand Total	**40**

Note: *NUE (Non University Exam) subjects' examination will be conducted once in academic year out of 40 marks and marks will be submitted to university. No CIA exam will be conducted for NUE subjects.

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ANNEXURE-3

Item No. 5: Proposal for approval of the assessment scheme for examinations for the first year BPT program

Generalized Practical Examination Scheme

Pattern	University and Internal Examination		CIA
	Human Anatomy & Human Physiology	Fundamentalsof exercise modalities, Fundamentalsof ElectroPhysicalAgents	
Long case	NIL	1 X 30 = 30	NIL
Spots	6 X 5 = 30	NIL	NIL
OSPE	2 X10=20	2 X10=20	2 X10=20
Viva	20	20	20
Journal	10	10	NIL
Total	**80**	**80**	**40**

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ANNEXURE-3

Item No. 5: Proposal for approval of the assessment scheme for examinations for the first year BPT program

Calculation for Internal Assessment marks

1. The weightage of Internal examination and CIA marks will be in the 60:40 ratio respectively as per the NCAHP curriculum (Page-49)
2. The Internal examination will be conducted out of 80 and CIA for 40 marks for subjects with 80 marks university examination (*Human Anatomy, Human Physiology, Fundamentals of exercise modalities, Fundamentals of Electro Physical Agents, Fundamentals of Healthcare delivery System in India and Psychology & Sociology)*
3. The Internal examination will be conducted out of 40 and CIA for 20 marks for subjects with 40 marks university examination (*Biochemistry*)
4. The IA marks calculation will be as follows:

a. For subjects with 80 marks university examination: IA Marks = 20

IA Marks weightage 60% = 12/20

CIA Marks weightage 40% = 8/20

Formula to calculate final IA marks –

$$\left\{\frac{\text{Marks obtained in both Internal exam}}{160} \times 12\right\} + \left\{\frac{\text{Marks obtained in CIA exam}}{40} \times 8\right\} = \text{Final IA marks}$$

b. For subjects with 40 marks university examination: IA marks = 10

IA Marks weightage 60% = 6/10

CIA Marks weightage 40% = 4/10

Formula to calculate final IA marks –

$$\left\{\frac{\text{Marks obtained in both Internal exam}}{80} \times 6\right\} + \left\{\frac{\text{Marks obtained in CIA exam}}{20} \times 4\right\} = \text{Final IA marks}$$

MGM School of Physiotherapy Chh. Sambhajinagar

Resolution No. 5.17 of Academic Council (AC-53/2026): Resolved to approve the proposed examination scheme for Non-University Examination (NUE) subjects, consisting 40-mark at college-level examination with provision for a betterment examination in case of failure. The marks obtained in these subjects will be reflected in the university marksheet. It was further resolved that students who fail to clear the NUE subjects even after the betterment examination shall not be eligible to appear for the university examinations as passing these subjects is mandatory prior to appearing for the university examinations. This provision shall be implemented from the Academic Year 2026-2027 onwards for both the campuses subject to any further guidelines issued by NCAHP [ANNEXURE-55].

ANNEXURE 4

Annexure-55 of AC-53/2026

Examination pattern for Non University Subject Examination
Proposal for approval of the assessment scheme for NUE Subject examinations for the first year BPT program

English (EG) - Course code - B.P.T -108
&
Information Technology (IT) Course code- B.P.T -109

Q. 1	Short Answer (Any 5 out of 6)	5 x 5	25 marks
Q. 2	Very Short Answer (Any 5 out of 6)	5 x 2	10 marks
Q. 3	MCQ	5 x 1	5 marks
Total: 40 marks			

- Non-University Examination (NUE) subjects shall be assessed at the institutional (college) level through a single examination of 40 marks.
- A provision for a betterment (supplementary) examination shall be made available for students who fail to achieve the minimum passing criteria.
- It shall be mandatory for all students to successfully pass the NUE subjects before becoming eligible to appear for the respective University Examinations.



4.20. 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 and applied knowledge of the subject. 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.

4.21. Level Suggested Verbs

Verbs in various levels as per Bloom's taxonomy as seen in table 4.16.

4.22. Weightage of Levels of Taxonomy for effective learning experience of B.P.T. Graduates

Bloom's Taxonomy helps Physiotherapy educators create learning goals that cover a range of skills, from basic recall to critical thinking and problem-solving. The six hierarchial levels representing cognitive skills are depitcted with their weighted percentage for effective learning experience for a B.P.T. graduate in Table 4.5.

Table 4.5: Weightage of Levels of Taxonomy for effective learning experience for BPT Graudates

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

4.23. Practical/Clinical examination

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

4.23.2. Assessment tools like case presentations, Objective Structured Clinical Examination (OSCE) and/or Objective Structured Practical Examination (OSPE) and Directly Observed Procedural Skills (DOPS) should be employed, where applicable.

4.23.3. 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.

4.23.4. 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.

4.24. Proposed Question Paper Style: BPT

4.24.1. Theory paper

i. **Duration: 3 Hours**

ii. **Total Marks: 80**

iii. **Format:**

a. Section-I

Que. 1 Long Answer 2 x 10 = 20 (Any 2 out of 3)

Que. 2 Short Answer 2 x 05 = 10 (Any 2 out of 3)

Que. 3 Very Short Answer 5 x 02 = 10 (Any 5 out of 6)

b. Section-II

Que. 4 Long Answer 1 x 15 = 15 (Any 1 out of 2)

Que.5 Short Answer 3 x 05 = 15 (Any 3 out of 4)

Que. 6 MCQ 1X 10 = 10

4.24.2. Practical Examination (University)

i. **Total Marks: 80**

ii. **Format:** On the basis of

a. OSPE / OSCE,

b. Viva,

c. Case presentation.

4.25. Credit and grading and Transcript

4.25.1. 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.

4.25.2. 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

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

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

iii. CR - One credit for every three hours of field work posting (1 credit course = 45 hours)

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

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

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

vii. 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.

4.26. Marks equivalence table Grades and Grade Points

Table 4.6: Equivalence Table for Marks, 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 50	

4.26.1. 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

4.26.2. 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.

4.26.3. 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

4.26.4. **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 (Si) = $\sum(Ci \times Gi) / \sum Ci$

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course. Format for Transcripts and Illustration of Computation of AGPA based on Total credits of a year is shown in Table 4.7.

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 = ∑(Ci x Si) / ∑ Ci

where Si is the AGPA of the ith years and Ci is the total number of credits in that year. Format for Transcripts and Illustriation of Computation of CGPA based on AGPA and Credit of respective years is shown in Table 4.8.

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

Table 4.7: Illustration for Computation of (AGPA) Annual Grade Point Average

Course	**Credit (Ci)**	**Grade letter**	**Grade point (Gi)**	**Credit Point = Credit (Ci)x Grade point (Gi)**
Course 1	3		8	24
Course 2	4		7	28
Course 3	3		6	18
Course 4	3		10	30
Course 5	3		5	15
Course 6	4		6	24
Total	**20**			**139**
AGPA (Si) = Credit points/Total credit		**139/20 =6.95**		

iv. The CGPA shall be calculated as in Table 4.8, after deriving yearwise AGPA and rounded off to 2 decimal points and reported in the transcripts.

Table 4.8: Illustration for Computation of Cumulative Grade Point Average (**CGPA)**

	Total credit	AGPA	AGPA X CREDIT	Credit points
Year 1	55	6.9	55 X6.9 =	379.5
Year 2	56	7.8	56 X 7.8 =	436.8
Year 3	42	5.6	42 X5.6 =	235.2
Year 4	45	6	45 X6 =	270
Total	**198**			**1321.5**
CGPA = credit points/ total credit		**1321.5 /198=6.67**		
INTERNSHIP				
TOTAL	69			

4.27. Scheme of study [Minimum Hours]

4.27.1. **Minimum** Available hour per week = 38 [6 days x 7 Hours = 42]

4.27.2. Minimum Duration of year = 220 days

4.27.3. Max.Vacation per year- 30 days.

4.27.4. Minimum teaching hours per year = 1560

4.27.5. Calculation of credit for student (As per National Credit Framework)

One credit course in a year =

i. Theory = 15 Hours

ii. Practical / Clinical = 30 Hours

iii. Field work = 45 Hours

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

4.28.1. First Year B. P. T. Examination [Annual Pattern]

Table 4.9: First Year B.P.T. Examination Scheme

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	BPT- 101 Human Anatomy (HA)	20	20	80	20	60	**200**	180	120	**300**	12	4	**16**
2	B.P.T -102 Human Physiology (HP)	20	20	80	20	60	**200**	180	120	**300**	12	4	**16**
3	B.P.T -103 Biochemistry (BC)	10		40			**50**	90		**90**	6		**6**
4	B.P.T -104 Fundamentals of exercise Modalities (FoEM)	20	20	80	20	60	**200**	120	60	**180**	8	2	**10**
5	B.P.T -105 Fundamentals of Electro Physical Agents (FoEA)	20	20	80	20	60	**200**	120	60	**180**	8	2	**10**
6	B.P.T -106 Psychology & Sociology (PS)	20		80			**100**	120		**120**	8		**8**
7	B.P.T -107 Fundamentals of Healthcare delivery System In India (FoHS)	20		80			**100**	120		**120**	8		**8**

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
8	B.P.T -108 English (EG)			[NUES]				60		**60**	4		**4**
9	B.P.T -109 Information Technology (IT)			[NUES]				60		**60**	4		**4**
10	B.P.T- 110 Clinic Orientation (COr)								150	**150**		5	**5**
	Grand Total	130	80	520	80	240	**1050**	1050	510	**1560**	70	17	**87**

- **N.B. -** Setting Question Paper will be done as per the subjects in Annual Pattern

4.28.2. Second Year B. P. T. Examination [Annual Pattern]

Table 4.10: Second Year B.P.T. Examination Scheme

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T-201 Pathology & Microbiology (PM)	20		80			100	120		120	8		8
2	B.P.T-202 Pharmacology (PC)	20		80			100	90		90	6		6
3	B.P.T-203 Public Health & Health Promotion (PH)	20		80			100	120		120	8		8
4	B.P.T-204 Emergency Care and life support Skills (ECLS)	20		80			100	90	30	120	6	1	7
5	B.P.T205 Exercise therapy (ExT)	20	20	80	20	60	200	150	120	270	10	4	14
6	B.P.T -206 Electrotherapy (ET)	20	20	80	20	60	200	150	120	270	10	4	14
7	B.P.T-207 Biomechanics & Kinesiology (BK)	20		80			100	120	60	180	8	2	10

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
8	B.P.T-208 Yoga and Systems of Medicine (YoG)	20	20	80	20	60	200	120	60	180	8	2	10
9	B.P.T.-209 Clinical Observation (COb)								210	210		7	7
	Grand Total	160	60	640	60	180	**1100**	960	600	**1560**	64	20	84

- N.B.-Setting Question Paper will be done as per the subjects in Annual Patten.

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

Table 4.11: Third Year B.P.T. Examination Scheme

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory Hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -301 General Medicine and Pediatrics (GMP)	20		80			100	90	30	120	6	1	7
2	B.P.T-302 General Surgery (GS)	20		80			100	90	30	120	6	1	7
3	B.P.T -303 Orthopedics (OR)	20		80			100	90	30	120	6	1	7
4	B.P.T -304 Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS)	20	20	80	20	60	200	180	120	300	12	4	16

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory Hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
5	B.P.T-305 Physiotherapy in Adult and Pediatric Orthopedics Conditions (PTO)	20	20	80	20	60	200	180	120	300	12	4	16
6	B.P.T-306 Physical & functional Diagnosis & Prescription (PFDP)	20	20	80	20	60	200	120	60	180	8	2	10
7	B.P.T-307 Research Methodology, Biostatistics and Evidence Based Practice (RMB)	20		80			100	120		120	8		8
8	B.P.T-308 Clinical Education (CEd)								300	300		10	10
	Grand Total	140	60	560	60	180	1000	870	690	1560	58	23	81

- N.B. - Setting Question Paper will be done as per the subjects in Annual Patten.

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

Table 4.12: Fourth Year B.P.T. Examination Scheme

S. No.	Subject	Internal Assessment		University Examination			Total Marks	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 (NPNS)	20		80			100	90	30	120	6	1	7
2	B.P.T-402 Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN)	20	20	80	20	60	200	150	60	210	10	2	12
3	B.P.T-403 Cardiothoracic diseases and surgeries (CTD)	20		80			100	90	30	120	6	1	7
4	B.P.T-404 Physiotherapy in Adult and Pediatric Cardiothoracic conditions and Surgical Conditions (PTCT)	20	20	80	20	60	200	150	60	210	10	2	12
5	B.P.T-405 Sports Physiotherapy & Exercise Prescription (PTS)	20	20	80	20	60	200	150	60	210	10	2	12

S. No.	Subject	Internal Assessment		University Examination			Total Marks	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
6	B.P.T-406 PT Ethics, Medico Legal aspects, Management &Administration (PTLM)	20		80			100	90		90	6		6
7	B.P.T-407 Community Physiotherapy & Rehabilitation (CPTR)	20	20	80	20	60	200	90	30	120	6	1	7
Project Work Orientation [NUES] (PW) B.P.T-408							0	90	0	90	6	0	6
CLINICAL ROTATION (CR) B.P.T-409									390	390		13	13
GRAND TOTAL							1100	900	660	1560	60	22	82

- N.B.-Setting Question Paper will be done as per the subjects in Annual Pattern.

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4.28.5. B.P.T. INTERNSHIP GUIDELINES:

4.28.5.1. Internship Goals and Objectives**:** Internship shall be part of the curriculum of the bachelor of Physiotherapy and shall be called "Rotatory clinical internship"

i. 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.

ii. Objectives- At the end of internship programme the Physiotherapy graduate should have following competencies.

a. Can assess, diagnose, prevent and treat the patients of Physiotherapy independently

b. Opportunity to develop confidence and increase skill in simulation and treatment delivery

c. Effective communicator with patient, families, colleagues and the community.

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

4.28.5.2. 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.

4.28.5.3. 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:

i. The hospitals must have separate Physiotherapy department with qualified and registered Physiotherapy professionals (with the respective Physiotherapy Council/ Commission).

ii. The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.

iii. Senior Physiotherapist with sufficient clinical experience should manage the Physiotherapy departments in the Institutes/Hospitals.

4.28.5.4. 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 intends to do his Internship.

4.28.5.5. **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. 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).

4.28.5.6. **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.

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

4.28.5.8. 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 damage caused to the equipment resulting from improper use by him/her.

4.28.5.9. 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.

i. **Total duration-** One year or twelve months; Seven hours a day for six days a week amounting to min 2016 hours. **12 months = 1 year = 2016 hours [Minimum Hours] (7X6X48)**

ii. 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 12 days, he/she will have to work for the extra days during which the candidate has remained absent.

iii. 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.

iv. Duration of 12 months inclusive of posting in rural setup/CBR/similar setup.

v. **Time distribution:** 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 as shown in Table 4.13.

Table 4.13: Duration of Department wise Rotatory posting during B.P.T. Internship

Sl. No.	Departments / areas	Duration
1	Musculoskeletal / Orthopaedic Physiotherapy	45 days
2	Neurological Physiotherapy	45 days
3	Community Physiotherapy/ Rural posting	2 months
4	Cardiology ICU/NICU	1 Month
5	Pulmonology/TB Hospital/ Medicine	1 Month
6	Sports Physiotherapy	1 month
7	Obstetrics and gynecological Physiotherapy	1 month
8	Pediatric	1 month
9	Surgery/ Oncology	1 month
10	Burns and Plastic Surgery	1 month

4.28.5.10. At the end of the Internship, a log book as prescribed in the Curriculum, duly signed by the Principal of the concerned Institute, must be preserved in the Institute.

4.28.5.11. 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. Detail discussed in 4.29.

i. 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.

ii. In the event of an unsatisfactory report, the said intern shall have to repeat the internship for the period to be decided by the Head of the Institution concerned.

iii. Intern will abide by all the rules & regulations of Institution/Hospital where they are posted.

4.28.5.12. 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's leave taken.

ii. 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.

iii. 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.

iv. 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.

4.28.5.13. Role of Hospital Administration in B.P.T. Internship : **Authority has to ensure that**

i. The faculty Intern/ student ratio shall be maximum 1:10

ii. 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.

iii. 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.

iv. 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.

v. The clinical facilities/ hospitals shall be inspected by the Commission for allocating the number of clinical trainees / interns in each hospital/ facility.

vi. Grant of **Leave to the intern-** 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.

4.28.6. Assessment of B.P.T. Internship

4.28.6.1. Continuous Assessment and Documentation:

i. **Initial Assessment Documentation:** An intern must document the following information: Initial assessment documented based on SOAP format.

   a. Subjective examination (symptomatic)

   b. Objective examination (measurable, observable)

   c. Action/Analysis (interpretation of current condition/intervention provided)

   d. Plan of action

   e. Written or verbal feedback of the client or other relevant carers

   f. Discharge plan

   g. Agreement of treatment plan by patient or "person responsible"

ii. **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

iii. **Twelve case presentation is mandatory during the one-year internship**

4.28.6.2. **Project work/ Case Presentations:** Course objective:

a. 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.

b. Twelve case presentation is mandatory during the one-year internship. 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.

4.28.6.3. **Examination:** There will be no university examination.

i. 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, criteria domain for which is depicted in Table 4.14 and 4.15.

ii. 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.

EVALUATION OF STUDENTS UNDER INTERNSHIP

Table 4.14: Criteria of Evaluation of Students during B.P.T. Internship

Sl. 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	

Table 4.15: Domain Criteria and Weightage for Evaluation of Students during B.P.T. Internship

Domains	% of total marks of the internal assessment
Attendance	10%
Log book	30%
Project	60%

4.29. SKILLS BASED OUTCOMES AND MONITORABLE INDICATORS FOR BACHELOR OF PHYSIOTHERAPY

4.29.1. Competency Statements

i. Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.

ii. Collect assessment data relevant to the client's needs and Physiotherapy practice.

iii. Be able to conduct the patient evaluation and assessment as per condition.

iv. Analyzing Assessment findings & establish Physiotherapy diagnosis and prognosis.

v. Develops and recommends an intervention strategy.

vi. Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan

vii. Implements intervention.

viii. Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises

ix. Advise patient on nutrition, exercises, rest, relaxation and other issues.

x. Evaluates the effectiveness of interventions.

xi. Be able to complete accurate treatment documentation.

xii. Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.

xiii. Establishes and maintains inter-professional relationships, which foster effective client centered collaboration.

xiv. Understand the principles of continuous quality improvement.

xv. Be able to carry out the daily/weekly Quality Control (QC) checks.

xvi. Be able to review the literature.

xvii. Be able to suggest implementation of research findings.

xviii. Be able to suggest/ initiate topics for Physiotherapy research

xix. Be able to interpret, apply and disseminate information as a member of the Physiotherapy team.

4.29.2. Guidelines for the implementation of the training procedure Discipline wise

4.29.2.1. **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:-

i. Orthopaedic Assessment of patients

ii. Physiotherapy treatment of post-operative fractures

iii. Physiotherapy treatment of orthopaedic conditions

iv. Assessment and Physiotherapy management of arthroplasty

v. Assessment and Physiotherapy management of various degenerative conditions

vi. Rehabilitation of amputee

vii. Rehabilitation of poliomyelitis

viii. Assessment and Physiotherapy management of congenital deformities.

4.29.2.2. **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: -

i. Neurological Assessment of patient

ii. Motor and sensory assessment

iii. Balance and coordination assessment

iv. Examination of cranial nerves

v. Examination of higher function

vi. transfers and ambulation of patient with spinal injuries

vii. Physiotherapy management of various neurological conditions

4.29.2.3. **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:

i. Bed side case discussion and presentation

ii. Cardiopulmonary assessment of patient

iii. ICU monitoring

iv. Cardiac rehabilitation

v. Pulmonary rehabilitation

vi. Pre and post-operative treatment in cardiothoracic conditions

vii. Various Physiotherapy techniques used in cardiothoracic conditions

viii. Chest Physiotherapy for neonates and children

4.29.2.4. **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; -

i. Pre participation evaluation for risk factor identification.

ii. Assessment and Physiotherapy management of acute sports injuries.

iii. Assessment and Physiotherapy management of overuse sports injuries.

iv. Testing of fitness components such as power, endurance, flexibility, balance.

v. Bandaging and tapping application. Disability evaluation and its rehabilitation

vi. Principles of orthotics and prosthetics

vii. Management of various intellectual disabilities and its rehabilitation including vocational training

viii. Rehabilitation of various speech and hearing impairments, vocational and social rehabilitation.

ix. Knowledge of assisted devices

x. Handling sport injury emergency.

4.29.2.5. **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.

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

i. Assessment and Physiotherapy management of antenatal and postnatal cases.

ii. Physiotherapy management in cases of prolapse uterus

iii. Physiotherapy management in cases of menstrual disorders and other gynecological disorders.

iv. Physiotherapy management in urinary incontinence

v. Physiotherapy management in pelvic inflammatory disease.

4.29.2.7. **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;-

i. Monitoring of vital signs

ii. Assessment and Physiotherapy management of common cardiothoracic conditions.

iii. Assessment and Physiotherapy management of common respiratory conditions.

iv. ICU monitoring

v. Assessment and Physiotherapy management of pre and post common surgical conditions.

vi. Assessment and Physiotherapy management of diseases commonly encounter in neonates and children

vii. Screening of developmental disorders

viii. Assessment and Rehabilitation of various speech and hearing impairments in children.

ix. Chest Physiotherapy in neonates and children.

x. Assessment and Physiotherapy management of burn cases.

xi. Assessment and Physiotherapy management of cancer patients.

xii. Assessment and Physiotherapy management of common integumentary conditions.

4.29.3. The Intended Course Outcome with Competency Levels, Learning Methods and Assessment methods are depicted in Table 4.16.

Table 4.16: Intended Course Outcome with Competency Levels, Learning Methods and Assessment Methods

Course	Intended Learning Outcome	Teaching Learning Methods	Assessment Methods
Competency level	K – Knows [Describe, Define] KH – Knows How [Explain, Analyse, Identify, Recognise] S- Shows [Demonstrate] SH – Shows How [Demonstrate] P- Performs Independently [Perform]	• 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	• MCQs • Assignments • Short Essays • Long essay • Spotters • Viva Voice • Presentations • Debate

4.29.4. Skill based Learning Outcomes, knowledge and monitorable indicators to be ascertained after the study of B.P.T curriculum are mentioned in Table 4.17 after the B.P.T curriculum.

4.30. B.P.T curriculum

B.P.T 1ST YEAR SYLLABUS COURSE CODE - BPT -101

Course Title: B.P.T. Human Anatomy (HA): Lecture (L): Practical (P)

HA 1.0. Subject Description and instruction to teacher

Anatomy is the first language of medical science. It is important that students be provided with the basic information about the ways of learning the various terminologies and concepts. The course is designed to provide students with working knowledge of the structure of the human body which is essential foundation for their clinical studies. The musculoskeletal system should be taught in greater detail with emphasis on muscles joints, nerves and blood vessels of upper limb, lower limb and spine. A 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.

HA 1.0.1. Course Outcomes: Course Anatomy

Intended Learning Outcome: Competency level

K – Knows

KH – Knows How

S- Show

SH – Shows How

P- Performs Independently

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)

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HA 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

HA 1.0.3. Assessment Methods

1. MCQs
2. Long & Short Essays
3. Spotters

Course Contents : B.P.T. HA 101 (L)

Unit:1

HA 1.1. Define Scope of Anatomy

HA 1.2. Discuss the Anatomical Position and anatomical Terminology common anatomical terminologies (Groove, tuberosity, trochanters etc.)

HA 1.3. Identify Anatomical positions of body, axes, and planes

Bone:

HA 1.4. Discuss Composition, Functions, Classification based on Morphology,

HA 1.5. Describe Development and Structure; Formation / Development of Bones esp. Long Bones; Parts of Long Bones

HA 1.6. Discuss the Blood Supply of Bones

Cartilage:

HA 1.7. Describe Types and Features of cartilage

Joints:

HA 1.8. Define and state types of joints.

HA 1.9. Discuss the features of fibrous, Cartilaginous & Synovial joints, sub-types of synovial joints

HA 1.10. Explain the movements of joints, factors permitting and limiting these movement

HA 1.11. Discuss blood supply of joints; applied aspects.

Muscles:

HA 1.12. Discuss Comparative Feature of Skeletal, Smooth and Cardiac Muscles, parts & structure of Skeletal Muscle including fascicular architecture

HA 1.13. Describe Blood supply and nerve supply of Skeletal Muscle; Motor Unit

HA 1.14. 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:

HA 1.15. Explain Composition i.e. Cellular & Non-Cellular components;

HA 1.16. Types and functions of connective tissue;

HA 1.17. Types and functions of Ligaments;

HA 1.18. Applied Aspects.

General Embryology:

HA 1.19. 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).

HA 1.20. 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:

HA 1.21. Discuss the Structure of skin and its appendages

Unit:2 Upper Extremity

Musculo Skeletal Anatomy of Upper Extremity

HA 2.1. Identify Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, and Phalanges.

HA 2.2. 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.

HA 2.3. Explain Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.

HA 2.4. Discuss Arches of hand, skin of the palm and dorsum of hand.

Unit 3: Thorax:

Cardio-vascular system

HA 3.1. Describe Mediastinum: Divisions and contents Pericardium

HA 3.2. Describe Thoracic Wall: position, shape and parts of the heart; conducting System

HA 3.3. Describe blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.

Respiratory system

HA 3.4. Outline the respiratory passages, Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.

HA 3.5. Describe Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.

HA 3.6. Describe Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

UNIT 4: Lower Extremity:

Musculo Skeletal Anatomy of Lower Extremity

HA 4.1. Identify Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.

HA 4.2. 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.

HA 4.3. 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:

HA 5.1. Identify Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.

HA 5.2. Discuss Soft tissue: Pre and Para vertebral muscles, intercostal muscles, anterior abdominal wall muscles, Inter-vertebral disc.

HA 5.3. Describe Pelvic girdle and muscles of the pelvic floor.

Unit 6: Abdomen:

HA 6.1. Describe Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.

HA 6.2. Describe large blood vessels of the gut.

HA 6.3. 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.

HA 6.4. Describe Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.

Unit 7: Endocrine glands:

HA 7.1. 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:

HA 8.1. Identify Osteology: Mandible and bones of the skull.

HA 8.2. 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

HA 9.1. 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: B.P.T. Human Anatomy 101 Practical : HA (P)

HA (P) 10.1 Identify the parts of bones (Upper limb, lower limb and spine)

HA (P) 10.2 Identify the muscles of extremities, trunk and face on a dissected human body/3 D models.

HA (P) 10.3 Identify the joints of extremities, trunk and face on a dissected human body/3 D models.

HA (P) 10.4 Identify the course and relationships of major peripheral nerves including plexuses formation

HA (P) 10.5 Identify the surface markings of joints, fascia, ligaments and muscles of extremities, trunk and face on a model

HA (P) 10.6 Identify the grass structure of heart, lungs, brain and spinal cord on a dissected

HA (P) 10.7 Human body/3 D models

Recommended Text Books for HA

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.
4. Singh I. Textbook of human neuroanatomy. Jaypee Brothers Publishers; 2006.
5. Kadasne'S T.B. of Anatomy Vol.1 Upper and Lower Extremities2009
6. Singh V. Textbook of clinical neuroanatomy. Elsevier Health Sciences; 2014.
7. Dutta AK. Essentials of human anatomy, head and neck.

Recommended Reference Books for HA

1. Gray's Anatomy: Descriptive and Applied. Longman
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 (HP): Lecture (L): Practical (P)

HP 1.0. 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.

HP 1.0.1. Course Outcomes: Physiology

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 adaptions to exercise (KH)

HP 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

HP 1.0.3. Assessment Methods

1. MCQs
2. Assignments
3. Short Essays
4. Long essay
5. Spotters

Course Contents : B.P.T. HP 102 (L)

Unit 1: General Physiology

HP 1.1. Discuss Cell: Morphology. Organelles: their structure and functions And Transport Mechanisms across the cell membrane

HP 1.2. Discuss Body fluids: Distribution, composition.

Unit 2: Blood

HP 2.1. Explain Composition and functions of blood and Plasma:

HP 2.2. Describe RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief)

HP 2.3. Describe Hemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.

HP 2.4. Discuss WBC. Morphology, functions, count, its variation of each. Immunity

HP 2.5. Describe Platelets: Morphology, functions, count, its variations

HP 2.6. Discuss Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.

HP 2.7. Describe Blood Groups

HP 2.8. Describe Cross matching. Indications and complications of Blood Transfusion

HP 2.9. Discuss Composition, formation, circulation and functions of Lymph

Unit 3: Cardiovascular system

HP 3.1. 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.

HP 3.2. Explain Conducting system in terms of Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pres- sure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.

HP 3.3. Discuss Normal value. Determinants. Stroke volume and regulation of Cardiac Output: Heart rate and its regulation. Their variations

HP 3.4. Describe Definition Normal values and its variations. Determinants. Peripheral resistance of Arterial Blood Pressure Regulation of BP Arterial Pulse

HP 3.5. Discuss the causes and features of Shock

HP 3.6. Discuss Regional Circulations such as Coronary, Cerebral and Cutaneous circulation.

HP 3.7. Discuss cardiovascular changes during exercise.

Unit 4: Respiratory System

HP 4.1. Discuss the functions of – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.

HP 4.2. Explain the Mechanics of breathing in terms of Intra pleural and intrapulmonary pressure changes during respiration. Chest expansion.

HP 4.3. Discuss Spirometry- Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume

HP 4.4. Discuss Pulmonary Circulation. Ventilation-perfusion ratio and its importance.

HP 4.5. 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.

HP 4.6. Explain Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.

HP 4.7. Discuss Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnia. Asphyxia. Cyanosis – types and features. Dysbarism

HP 4.8. Explain Respiratory changes during exercise.

Unit 5: Digestive System

HP 5.1. Describe the functions of digestive system

HP 5.2. Describe Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication

HP 5.3. Discuss the stages and Function of Swallowing

HP 5.4. Describe Stomach in terms of Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.

HP 5.5. Describe Pancreatic Secretion: Composition, production, function. Regulation.

HP 5.6. Discuss the Functions of liver, Gall bladder And Composition, functions of bile.

Unit 6: Renal System

HP 6.1. Describe the functions of renal system. Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular mem- brane. Renal blood flow and its regulation. Functions of kidneys.

HP 6.2. Discuss the Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.

HP 6.3. Explain Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Filtered load. Renal tubular transport maxi- mum. Glucose clearance: TmG. Renal threshold for glucose.

HP 6.4. Discuss the Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.

HP 6.5. Describe Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.

HP 6.6. Describe Acid-Base balance

Unit 7: Reproductive System

HP 7.1. Discuss the physiology of reproductive organs. Sex determination. Sex differentiation. Disorder

HP 7.2. Describe Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.

HP 7.3. Describe Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis.

HP 7.4. Hormones: estrogen and progesterone-action. Regulation of secretion.

HP 7.5. Describe Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause.

HP 7.6. Describe Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods

Unit 8: Endocrine System

HP 8.1. Enumerate Major endocrine glands.

HP 8.2. Describe classification, mechanism of action and Functions of hormones

HP 8.3. Describe Pituitary hormones: Secretory cells, action on target cells, and regulation of secretion of each hormone.

HP 8.4. Describe Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease

HP 8.5. Describe Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.

HP 8.6. Describe Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytoma.

HP 8.7. 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

HP 9.1. Discuss Resting membrane potential. Action potential – ionic basis and properties.

HP 9.2. Describe Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.

HP 9.3. Describe Neuroglia: Types and functions

HP 9.4. Classify Skeletal muscle Structure.

HP 9.5. Discuss the physiology of neuromuscular transmission

HP 9.6. Discuss the applied aspects of neuromuscular disorders.

Unit 10: Nervous System

HP 10.1. Describe Organisation of CNS – central and peripheral nervous system.

HP 10.2. Describe Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties

HP 10.3. 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

HP 10.4. Discuss Sensory cortex. Somatic sensations: crude touch, fine touch tactile localization, tactile discrimination, stereo gnosis vibration sense,

HP 10.5. Describe kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain – slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain.

HP 10.6. 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.

HP 10.7. Describe Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL

HP 10.8. Discuss Spinal cord Lesions: Complete transection and Hemi section of the spinal cord.

HP 10.9. Describe Cerebellum: Functions. Cerebellar ataxia.

HP 10.10. Describe Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.

HP 10.11. Describe Functions of Thalamus and Hypothalamus: Nuclei. Thalamic syndrome

HP 10.12. Describe Reticular Formation and Limbic System: Components and Functions.

HP 10.13. Describe Structures and functions of Basal Ganglia: Parkinson's disease

HP 10.14. Describe Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.

HP 10.15. Describe Formation, composition, circulation and functions of CSF Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.

HP 10.16. Describe Features and actions of parasympathetic and sympathetic nervous system

Unit 11: Physiology of Exercise – Explain the Effects of acute and chronic exercise on

HP 11.1 Respiratory,

HP 11.2 Cardio vascular

HP 11.3 Musculoskeletal system

Practical: B.P.T. Human Physiology 102 Practical : HP (P)

HP (P) 12.1 Practical classes include

1. Hematology experiments,
2. Clinical examinations,
3. Amphibian chart, and
4. Recommended demonstrations.

HP (P) 12.2 Recommended demonstrations include but are not limited to:

i. Differentiate Blood cells

ii. Determine the blood cell counts

iii. Determine Blood groups

iv. Calculate bleeding and clotting time

v. Observe the procedures of common blood investigations

vi. Elicit superficial and deep tendon reflexes

vii. Determine muscle tone

viii. Interpret normal ECG wave pattern

ix. Identify normal breath sound

x. Differentiate Heart sounds including murmurs

HP (P) 12.3 Perform the following clinical examination procedures:

i. Body Temperature measurement

ii. Pulse rate

iii. Blood Pressure

iv. Oxygen saturation

v. Respiratory rate

Recommended text Book for HP

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 for HP

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

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COURSE CODE BPT 103

Course Title: BIOCHEMISTRY (BC): Lecture (L)

BC 1.0. 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

BC 1.0.1 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)

BC 1.0.2 Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

BC 1.0.3 Assessment Methods:

1. MCQs
2. Long & Short Essays

Course Contents: B.P.T. BC 103 (L)

SECTION A

Unit 1

BC 1.1. Acid-Base balance - 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.

BC 1.2. Carbohydrate Chemistry –

1. Definition, general classification with examples, Glycosides bond
2. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Poly- saccharides.
3. Glycosaminoglycan (mucopoly saccharides)
4. Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
5. Glycogen metabolism – Glycogenesis, Glyco Geno lysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle Hormonal regulation of glucose, Glycosuria, Diabetes mellitus
6. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers.

BC 1.3. Lipid Chemistry –

1. Definition, general classification
2. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol
3. Essential fatty acids and their importance
4. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies
5. Role of lipids in diet

BC 1.4. 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

BC 1.5. 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
    i. Recommended dietary allowances
    ii. Nutritional disorders.

Unit 2:

BC 2.1. Enzymes – 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)

BC 2.2. 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.

BC 2.3. Vitamins -

1. Definition, classification according to solubility,
2. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.

BC 2.4. Mineral Metabolism- 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.

BC 2.5. Clinical Biochemistry - 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 for BC

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 & Clincial aspects- Marshall &Bangert- Churchill Linvingstone.
4. Biochemistry Southerland-Churchill Livingstone.

Recommended Reference books for BC

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

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COURSE CODE BPT 104

Course Title: FUNDAMENTALS OF EXERCISE MODALITIES: FoEM: Theory (L) Practical (P)

FoEM 1.0. 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

FoEM 1.0.1 Course Outcomes: Fundamentals of Exercise Modalities

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)

FoEM 1.0.2 Teaching Learning Methods:

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

FoEM 1.0.3 Assessment Methods:

1. MCQs
2. Long & Short Essay
3. Assignments
4. Viva Voce
5. OSPE

Unit 1: Basic principles

FoEM 1.1. 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

FoEM 1.2. 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

FoEM 1.3. Discuss Muscle work group action of muscles, angle of pull and mechanical efficiency of the muscles.

Unit 2: Starting and Derived Positions

FoEM 2.1 Demonstrate the starting positions, their muscle work, effects and uses and Standing, Kneeling, Sitting, Lying and Hanging.

FoEM 2.2 Demonstrate derived positions. Discuss the muscle work of each derived position Unit 3: Measurement of Joint Range

FoEM 2.3 Demonstrate Different methods of measuring range of motion (ROM).

FoEM 2.4 Discuss Reliability and validity of goniometry. Functional ROM and normal range of motion of various joint. Technique of Goniometry.

FoEM 2.5 Perform ROM measurement of individual joint's using goniometer.

Unit 3: Muscle testing

FoEM 3.1 Discuss the Principles & Aims, Indications & Limitations, and Techniques of MMT for group & individual testing

FoEM 3.2 Demonstrate Manual Muscle testing procedure

FoEM 3.3 Perform MMT for upper limb, lower limb spine and face muscles

Unit 4: Classification of therapeutic exercise

FoEM 4.1. Classify therapeutic exercises: Technique, effects, therapeutic use

FoEM 4.2. Demonstrate Active Movements

FoEM 4.3. Discuss active movements in terms of Definition of strength, power & work, endurance, muscle actions, Causes of decreased muscle performance,

FoEM 4.4. Explain the Physiological adaptation to training: Strength & Power, Endurance.

FoEM 4.5. Demonstrate Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses

FoEM 4.6. Demonstrate Active Assisted Exercise:

FoEM 4.7. Discuss the principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses

FoEM 4.8. 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

FoEM 4.9. 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 5

FoEM 5.1 Classify various types of soft tissue manipulation techniques.

FoEM 5.2 Discuss Physiological effects, therapeutic effects and contraindications of soft tissue manipulation.

FoEM 5.3 Describe effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

FoEM 5.4 Perform effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

PRACTICAL B.P.T. Fundamentals of Exercise Modalities 104 Practical : FoEM (P)

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)

FoEM (P) 6.1. Demonstrate the different types of muscle contraction, muscle work, group action of muscles and co-coordinated movements on self

FoEM (P) 6.2. Demonstrate various fundamental and derived positions. And describe muscle work, and uses on self

FoEM (P) 6.3. Measure the ROM of joints using hand held goniometer – upper limb, lower limb & trunk on human model

FoEM (P) 6.4. Demonstrate the relaxed passive movement of joints of upper limb and lower limb on human model

FoEM (P) 6.5. Instruct the patient to perform of the active mobilisation exercises of joints of upper limb and lower limb on human model

FoEM (P) 6.6. Perform passive mobilisation exercises of different joints region wise on self / human model

FoEM (P) 6.7. Demonstrate the testing of muscle strength/ function region wise – upper limb, lower limb and trunk On human model

FoEM (P) 6.8. Perform all the soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face On human model

FoEM (P) 6.9. Demonstration ONLY [to be shown to the student by the teacher]

1. Digital goniometry
2. Pelvic inclinometry
3. Dynamometry
4. Accessory passive movement

Recommended Text Books for FoEM

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 for FoEM

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

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COURSE CODE BPT 105

Course Title: Fundamentals of Electro Physical Agents (FoEA): Theory (L) Practical (P)

FoEA 1.0. 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 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

FoEA 1.0.1. **Course Outcomes**: **Fundamentals of Electro Physical Agents**

After completion of this course the student shall be able to

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, contraindications 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

FoEA 1.0.2. **Teaching** learning methods

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

FoEA 1.0.3. Assessment methods

1. MCQs
2. Long & Short Essay
3. Viva Voce
4. OSPE

Course Contents: B.P.T. FoEA 105 Theory (L)

Unit 1

FoEA 1.1. Physical Principles In Relation to Physiotherapy:

1. Structure and Properties of matter-solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity. Structure of atoms, molecules, elements and compounds, election theory, static and current electricity.
2. Conduction, Insulators, Potential difference, Resistance and Intensity. Ohm's Law its application to AC and DC currents.
3. Rectifying Devices-Thermionic valves, semiconductors, Transistors, Amplifiers, Transducers, Oscillator Circuits. Capacitance, Condensers in DC and AC circuits.
4. Display devices and indicators-analogue & digital.

FoEA 1.2. Effects of Current Electricity

1. Chemical effects- ions and electrolytes, ionization, production of E.M.F by chemical actions. Magnetic effects, Molecular theory of Magnetism. Magnetic fields, electromagnetic induction.
2. Milli ammeter and voltmeter, transformers and chose coil, thermal effects-joules law and heat production.
3. Physical principles of light and its properties.
4. Physical principles of sound and its properties.
5. Electromagnetic spectrum-biophysical application.

FoEA 1.3. Electrical Supply

1. Brief outline of main supply of electric current. Dangers short circuits, electric shocks.
2. Precautions safety devices, earthing, fuses etc. First and initial management of electric shock.

Unit 2

FoEA 2.1. Low Frequency Currents

Introduction to direct, alternating and modified currents.

1. **Iontophoresis:** Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation.
2. **Faradic current:** Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation
3. **Interrupted direct current:** Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation
4. **Transcutaneous Electrical Nerve Stimulations (TENS)** Types of low frequency, pulse widths, frequencies and intensities used as TENS applications, Theories of pain relief by TENS. Principles of clinical application, effects and uses, indications, contraindications, precautions. Operational skills of equipment patient preparation.

Unit 3

FoEA 3.1. Electrical Reactions and Electro-Diagnostic Tests

1. Electrical stimuli and normal behavior of nerve and muscle tissue. Types of lesions and development of reaction of degeneration.
2. Faradic/Intermittent direct current test.
3. S.D. Curve and its application. Chronaxie, Rheobase and pulse ratio.

Unit 4

FoEA 4.1. **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.

FoEA 4.2. **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 B.P.T. Fundamentals of Electro Physical Agents 105 Practical : FoEA (P)

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)

FoEA (P) 5.1. Identify components and safety devices involved in electric supply of the electrotherapy department.

FoEA (P) 5.2. Experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.

FoEA (P) 5.3. Locate and stimulate different motor points region wise including the upper & lower limb, trunk face. On human model

FoEA (P) 5.4. Demonstrate the application of special techniques of low frequency current including Faradic foot bath, faradism under pressure

FoEA (P) 5.5. Demonstrate the application of techniques of Iontophoresis.

FoEA (P) 5.6. Demonstrate the plotting of strength duration curve and find out Chronaxie and Rheobase.

FoEA (P) 5.7. Demonstrate the techniques of application of various types of IR lamps to various body regions.

FoEA (P) 5.8. Demonstrate the techniques of application of paraffin wax bath to various body regions

FoEA (P) 5.9. Demonstrate the techniques of application of TENS to various body regions

Recommended Text Books for FoEA

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

Recommended reference books for FoEA

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

COURSE CODE-B.P.T -106

COURSE TITLE- PSYCHOLOGY AND SOCIOLOGY: (PSY) and (SOC) Theory (L)

SECTION A

Course Title: Psychology (PSY)

PSY 1.0. 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.

PSY 1.0.1. **Course Outcomes**: After completion of this course the student shall be able to General and Clinical Psychology

1. Describe the principles of psychology and it 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)

Course Contents: B.P.T. (PSY) 106 (L)

UNIT 1:

PSY 1.1. Introduction to Psychology

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

Unit 2:

PSY 1.2. Developmental Psychology

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

Unit 3:

PSY 1.3. Emotions and perception

1. Describe Emotions Concept and definition, Theories of emotions, Physiological changes due to emotional state. Nature and control of anger, fear and anxiety.
2. Describe Sensation, attention and perception Meaning and definition.
3. Describe Types of sensation and Perception.
4. Describe Principles of Perception. Illusion and hallucination concept of 1attention and Factors determining attention.

Unit 4:

PSY 1.4. Motivation and Learning

1. Definition, needs, drives and motives, primary motives and secondary motives, Achievement motivation.
2. Discuss the theories of motivation.
3. Describe theories of Learning
4. Describe Concepts, Characteristics, Types, Laws of Leaning, Theories of learning, Trial and Error theory,

5. Describe Conditioning-classical and operant, Insight theory of learning, Factors influencing learning.
6. 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.
7. Describe Intelligence; Discuss Characteristics, Types. IQ. Mental age.
8. Describe Assessment of intelligence, intelligence tests-verbal and performance test

Unit 5:

PSY 1.5. Psychology of frustration and Stress

1. Describe Frustration and stress under the following headings: Definition. Causes, Sources of frustrations, Conflict, Different types of conflicts, Adjustment and maladjustment. Defense Mechanism.
2. Describe Different types of Anxiety, Tension, Physiological symptoms, causes reactions to stresses, psycho-somatic problems, copying strategies.
3. Discuss the management of stress

Unit 6:

PSY 1.6. Personality

1. Define Personality and describe factors in personality development
2. Describe tools of Measurement of Personality-: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
3. Describe Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.
4. 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:

PSY 1.7. Social psychology

1. Describe Different types of leaders and Different theoretical approaches to leadership.
2. Describe development of attitude and Change of attitude.

Unit 8:

PSY 1.8. Clinical psychology

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

Recommended Text Books for PSY

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 for PSY

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 councelling 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 (SOC)

SOC 1.0. 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 dis- ability. 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.

SOC 1.0.1. Course Outcomes:

After completion of this course the student shall be able to Sociology

1. Discuss the sociological concepts in relations to health, healthcare, and disorders.(KH)
2. Explain social theories in relations to health and health care.(KH)
3. Discuss biomedical and biopsychosocial health models.(KH)
4. 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)
5. 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
6. Analyse the social cause for activity limitations and participatory restrictions caused by various disorders.(KH)

SOC 1.0.2. Teaching Learning Methods:

1. Lecture
2. Case studies
3. Field visit
4. Role play
5. Debate
6. Panel discussions

SOC 1.0.3. Assessment Methods:

1. Short Essay
2. Assignment
3. Presentations
4. Debate

Course Content: Course Contents: B.P.T. (SOC) 106 (L)

Unit 1

SOC 1.1 Introduction to sociology

SOC 1.2 Meaning- Definition and scope of sociology

SOC 1.3 Its relation to Anthropology, Psychology, Social Psychology.

SOC 1.4 Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.

SOC 1.5 Importance of its study with special reference to Health Care Professionals.

SOC 1.6 Social Factors in Health and disease situations:

1. Meaning of social factors
2. Role of social factors in health and illness

SOC 1.7 Socialization:

1. Meaning and nature of socialization.
2. Primary, Secondary and Anticipatory socialization.
3. Agencies of socialization.

SOC 1.8 Social Groups:

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.

SOC 1.9 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

SOC 2.1. 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.

SOC 2.2. Culture and Health:

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

SOC 2.3. 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.

SOC 2.4. Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to pre- vent 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.

SOC 2.5. Social Security: Social security and social legislation in relation to the disabled.

Recommended Text Books for SOC

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 for SOC

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

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COURSE CODE-B.P.T -107

COURSE TITLE- FUNDAMENTALS of Health care delivery System In India INTRODUCTION TO NATIONAL HEALTHCARE DELIVERY SYSTEM IN INDIA: (FoHC) : Theory (L)

FoHC 1.0. 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:

Course Contents: B.P.T. FoHC 107 Theory

SECTION-A

FoHC 1.1. Introduction to healthcare delivery system

FoHC 1.2. Healthcare delivery system in India at primary, secondary and tertiary care

FoHC 1.3. Community participation in healthcare delivery system

FoHC 1.4. Health system in developed countries.

FoHC 1.5. Private Sector

FoHC 1.6. National Health Mission

FoHC 1.7. National Health Policy

FoHC 1.8. Issues in Health Care Delivery System in India

SECTION- B

FoHC 1.9. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

FoHC 1.10. Health scenario of India- past, present and future

FoHC 1.11. Introduction to the profession of physiotherapy role of physiotherapy in national health issues and the expectations of society from physiotherapists

FoHC 1.12. The concepts of health and disease, risk factors, and the role of health promotion and disease prevention

FoHC 1.13. Explore the corporatization of health care.

FoHC 1.14. Identify the globalisation of health care.

FoHC 1.15. Assess the prospects of new health care reform.

FoHC 1.16. Understand various types of health services professionals and their training, practice requirements, and practice settings.

FoHC 1.17. Differentiate between primary care and specialty care, and identify the causes of the imbalance between primary care and specialty care

FoHC 1.18. Study the role of health care financing and its impact on the delivery of health care.

FoHC 1.19. Understand the basic concept of insurance and how general insurance terminology applies to health insurance.

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COURSE CODE- 108

COURSE TITLE - ENGLISH, COMMUNICATION AND SOFT SKILLS: (EG) : Theory (L)

EG 1.0. **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.

EG 1.0.1. Course outcomes

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

Course Contents: B.P.T. EG 108 Theory

Major topics to be covered under Communication course –

SECTION A

EG 1.1. Basic Language Skills: Grammar and Usage.

EG 1.2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.

EG 1.3. 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.

EG 1.4. Basic concepts & principles of good communication

SECTION-B

EG 1.5. Special characteristics of health communication

EG 1.6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.

EG 1.7. Therapeutic communication: empathy versus sympathy.

EG 1.8. Communication methods for teaching and learning.

EG 1.9. Communication methods for patient education.

EG 1.10. Barriers of communication & how to overcome.

COURSE CODE- 109

COURSE TITLE- COMPUTERS AND INFORMATION SCIENCE : (IT): Theory (L), Practical (P)

IT 1.0. **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.

IT 1.0.1. Course outcomes

1. To know the parts of computer
2. To have working knowledge of a computing system
3. Use computer for word processing and presentation and data management CO4 use the internet for personal and professional purpose
4. Understand the role of digital technology in the Health sciences

Course Contents: B.P.T. IT 109 Theory

IT 1.1. **Introduction to computer:** Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

IT 1.2. **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).

IT 1.3. **Processor and memory:** The Central Processing Unit (CPU), main memory.

IT 1.4. **Storage Devices:** Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

IT 1.5. **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.).

IT 1.6. **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.

IT 1.7. **Introduction to Excel:** introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

IT 1.8. **Introduction to power-point:** introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs/ photos/ Videos.

IT 1.9. **Introduction of Operating System:** introduction, operating system concepts, types of operating system.

IT 1.10. **Computer networks:** introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

IT 1.11. **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.

IT 1.12. Application of Computers in clinical settings.

PRACTICAL: : B.P.T. IT 109 (P)

IT (P) 2.1. 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

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
राष्ट्रीय सहबद्ध और स्वास्थ्य देखभाल व्यवसाय आयोग
स्वास्थ्यम् सर्वार्थसाधनम्
NCAHP
Since-2021

Resolution No. 5.13 of Academic Council (AC-53/2026): Since the NCAHP curriculum does not specify topic-wise distribution of teaching hours within subjects, the Academic council approved the implementation of the proposed topic-wise allocation of didactic hours for the BPT First Year curriculum for both campuses Navi Mumbai and Chhatrapati Sambhajinagar from the Academic Year 2026-2027 onwards, until official notification is received from NCAHP [ANNEXURE-53].

Annexure-53 of AC-53/2026

B.P.T Curriculum (Ist Year BPT)

B.P.T 1ST YEAR SYLLABUS COURSE CODE - BPT - 101

Course Title: B.P.T. Human Anatomy (HA): Lecture (L): Practical (P)

HA 1.0. Subject Description and instruction to teacher

Anatomy is the first language of medical science. It is important that students be provided with the basic information about the ways of learning the various terminologies and concepts. The course is designed to provide students with working knowledge of the structure of the human body which is essential foundation for their clinical studies. The musculoskeletal system should be taught in greater detail with emphasis on muscles joints, nerves and blood vessels of upper limb, lower limb and spine. A 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.

HA 1.0.1. Course Outcomes: Course Anatomy

Intended Learning Outcome: Competency level

K - Knows

KH - Knows How

S- Show

SH - Shows How

P- Performs Independently

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)

HA 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

HA 1.0.3. Assessment Methods (Marks distribution for assessment method for internal assessment not mentioned)

1. MCQ
2. Long & Short Essays
3. Spotters

Course contents: B.P.T HA 101(L)

Unit	Course content	Theory hours
1	**Unit 1**	
	HA 1.1 - Define Scope of Anatomy	2
	HA 1.2 - Discuss the Anatomical Position and anatomical Terminology common anatomical terminologies (Groove, tuberosity, trochanters etc.)	2
	HA 1.3 - Identify Anatomical positions of body, axes, and planes	2
	Bone	
	HA 1.4 - Discuss Composition, Functions, Classification based on Morphology,	1
	HA 1.5 - Describe Development and Structure; Formation / Development of Bones esp. Long Bones; Parts of Long Bones	3
	HA 1.6 - Discuss the Blood Supply of Bones	1
	Cartilage	
	HA 1.7 -Describe Types and Features of cartilage	3
	Joints	
	HA 1.8 - Define and state types of joints.	4
	HA 1.9 - Discuss the features of fibrous, Cartilaginous & Synovial joints, sub-types of synovial joints	1
	HA 1.10 - Explain the movements of joints, factors permitting and limiting these movements	5
	HA 1.11 - Discuss blood supply of joints; applied aspects.	1
	Muscles	
	HA 1.12 - Discuss Comparative Feature of Skeletal, Smooth and Cardiac Muscles, parts & structure of Skeletal Muscle including fascicular architecture	5
	HA 1.13- Describe Blood supply and nerve supply of Skeletal Muscle; Motor Unit	1

	HA 1.14 - Discuss the Types of Skeletal Muscles based on their action i.e. Agonists, Antagonists, Fixators, Synergists, Origin & Insertion, Tendon; Isometric & Isotonic contractions; Applied Aspects	2
	Connective Tissue	
	HA 1.15-Explain Composition i.e. Cellular & Non-Cellular components	1
	HA 1.16-Types and functions of connective tissue;	1
	HA 1.17-Types and functions of Ligaments;	1
	HA 1.18-Applied Aspects.	1
	General Embryology	
	HA 1.19-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).	1
	HA 1.20-Discuss Development of bones, axial and appendicular skeleton and muscles, Neural tube, brain vessels and spinal cord, Development of brain and brain stem structures	1
	Integumentary System	
	HA 1.21 - Discuss the Structure of skin and its appendages	1
2	**Unit 2: Upper Extremity**	
	Musculoskeletal Anatomy of Upper Extremity	
	HA 2.1 - Identify Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, and Phalanges.	5
	HA 2.2 - 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.	5
	HA 2.3 - Explain Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.	7
	HA 2.4 - Discuss Arches of hand, skin of the palm and dorsum of hand.	2
3	**Unit 3: Thorax**	
	Cardiovascular system	
	HA 3.1 - Describe Mediastinum: Divisions and contents Pericardium	4
	HA 3.2 - Describe Thoracic Wall: position, shape and parts of the heart; conducting System	2
	HA 3.3 - Describe blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.	2
	Respiratory System	
	HA 3.4 - Outline the respiratory passages, Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.	5
	HA 3.5 - Describe Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.	2

	HA 3.6 - Describe Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.	2
4	**Unit 4: Lower Extremity**	
	Musculo Skeletal Anatomy of Lower Extremity	
	HA 4.1 - Identify Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.	5
	HA 4.2 - 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.	10
	HA 4.3 - Discuss Joints of the lower limb: Hip Joint, Knee joint, Ankle and joint, joints of the foot.	15
5	**Unit 5: Musculo skeletal anatomy of trunk & pelvis**	
	HA 5.1 - Identify Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.	4
	HA 5.2 - Discuss Soft tissue: Pre and Para vertebral muscles, intercostal muscles, anterior abdominal wall muscles, Inter-vertebral disc.	4
	HA 5.3 - Describe Pelvic girdle and muscles of the pelvic floor.	4
6	**Unit 6: Abdomen**	
	HA 6.1 - Describe Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.	4
	HA 6.2 - Describe large blood vessels of the gut.	2
	HA 6.3 - 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.	5
	HA 6.4 - Describe Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.	7
7	**Unit 7: Endocrine glands**	
	HA 7.1 - 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.	4
8	**Unit 8: Musculo Skeletal Anatomy of Head and Neck**	
	HA 8.1 - Identify Osteology: Mandible and bones of the skull.	5
	HA 8.2 - Identify Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.	5
9	**Unit 9: Neuro Anatomy**	

	HA 9.1 -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)	30
Total hours		180

Practical: B.P.T. Human Anatomy 101 Practical: HA (P)

Unit	Content	Practical hours
HA (P) 10.1	Identify the parts of bones (Upper limb, lower limb and spine)	20
HA (P) 10.2	Identify the muscles of extremities, trunk and face on a dissected human body/3 D models.	20
HA (P) 10.3	Identify the joints of extremities, trunk and face on a dissected human body/3 D models.	20
HA (P) 10.4	Identify the course and relationships of major peripheral nerves including plexuses formation	05
HA (P) 10.5	Identify the surface markings of joints, fascia, ligaments and muscles of extremities, trunk and face on a model	20
HA (P) 10.6	Identify the grass structure of heart, lungs, brain and spinal cord on a dissected	30
HA (P) 10.7	Human body/3 D models	05
Total hours		**120**

Recommended Text Books for HA:

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.
4) Singh I. Textbook of human neuroanatomy. Jaypee Brothers Publishers; 2006.
5) Kadasne'S T.B. of Anatomy Vol.1 Upper and Lower Extremities2009
6) Singh V. Textbook of clinical neuroanatomy. Elsevier Health Sciences; 2014.
7) Dutta AK. Essentials of human anatomy, head and neck.

Recommended Reference Books for HA:

1) Gray's Anatomy: Descriptive and Applied. Longman
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: B.P.T. Human Physiology (HP): Lecture (L): Practical (P)

HP 1.0. 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.

HP 1.0.1. **Course Outcomes: Physiology**

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 adaptions to exercise (KH)

HP 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

HP 1.0.3. Assessment Methods (Marks distribution for assessment method for internal assessment not mentioned)

1. MCQs
2. Assignments
3. Short Essays
4. Long essay
5. Spotters

Unit	Course content	Theory hours
1	**Unit 1:General Physiology**	
	HP 1.1. Discuss Cell: Morphology. Organelles: their structure and functions and Transport Mechanisms across the cell membrane	3
	HP 1.2. Discuss Body fluids: Distribution, composition.	2
2	**Unit 2:Blood**	
	HP 2.1. Explain Composition and functions of blood and Plasma	2
	HP 2.2. Describe RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief)	1
	HP 2.3. Describe Hemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.	1
	HP 2.4. Discuss WBC. Morphology, functions, count, its variation of each. Immunity	1
	HP 2.5. Describe Platelets: Morphology, functions, count, its variations	1
	HP 2.6. Discuss Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.	1
	HP 2.7. Describe Blood Groups	1
	HP 2.8. Describe Cross matching. Indications and complications of Blood Transfusion	1
	HP 2.9 Discuss Composition, formation, circulation and functions of Lymph	1
3	**Unit 3: Cardiovascular System**	
	HP 3.1. 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	8
	HP 3.2. Explain Conducting system in terms of Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pres- sure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.	8
	HP 3.3. Discuss Normal value. Determinants. Stroke volume and regulation of Cardiac Output: Heart rate and its regulation. Their variations	3
	HP 3.4. Describe Definition Normal values and its variations. Determinants. Peripheral resistance of Arterial Blood Pressure Regulation of BP Arterial Pulse	3
	HP 3.5. Discuss the causes and features of Shock	1
	HP 3.6. Discuss Regional Circulations such as Coronary, Cerebral and Cutaneous circulation.	2

	HP 3.7. Discuss cardiovascular changes during exercise.	1
4	**Unit 4: Respiratory System**	
	HP 4.1. Discuss the functions of – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.	5
	HP 4.2. Explain the Mechanics of breathing in terms of Intra pleural and intrapulmonary pressure changes during respiration. Chest expansion.	5
	HP 4.3 Discuss Spirometry- Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume	3
	HP 4.4. Discuss Pulmonary Circulation. Ventilation-perfusion ratio and its importance.	3
	HP 4.5. 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.	4
	HP 4.6. Explain Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.	3
	HP 4.7. Discuss Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnia. Asphyxia. Cyanosis – types and features. Dysbarism	3
	HP 4.8. Explain Respiratory changes during exercise.	2
5	**Unit 5: Digestive System**	
	HP 5.1. Describe the functions of digestive system.	2
	HP 5.2. Describe Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication	1
	HP 5.3. Discuss the stages and Function of Swallowing	1
	HP 5.4. Describe Stomach in terms of Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting	2
	HP 5.5. Describe Pancreatic Secretion: Composition, production, function. Regulation.	2
	HP 5.6. Discuss the Functions of liver, Gall bladder And Composition, functions of bile.	2
6	**Unit 6: Renal System**	
	HP 6.1. Describe the functions of renal system. Nephrons – cortical and juxtamedullary. Juxta glomerular apparatus. Glomerular mem- brane. Renal blood flow and its regulation. Functions of kidneys.	5
	HP 6.2. Discuss the Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.	2
	HP 6.3. Explain Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Filtered load. Renal tubular transport maxi- mum. Glucose clearance: TmG. Renal threshold for glucose.	2

	HP 6.4. Discuss the Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.	2
	HP 6.5. Describe Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.	2
	HP 6.6 Describe Acid-Base balance	2
7	**Unit 7: Reproductive System**	
	HP 7.1. Discuss the physiology of reproductive organs. Sex determination. Sex differentiation. Disorder	5
	HP 7.2. Describe Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.	2
	HP 7.3. 6Describe Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis.	2
	HP 7.4. Hormones: estrogen and progesterone-action. Regulation of secretion.	2
	HP 7.5. Describe Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause.	2
	HP 7. 6 Describe Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods	2
8	**Unit 8: Endocrine System**	
	HP 8.1. Enumerate Major endocrine glands.	2
	HP 8.2. Describe classification, mechanism of action and Functions of hormones	2
	HP 8.3. Describe Pituitary hormones: Secretory cells, action on target cells, and regulation of secretion of each hormone.	2
	HP 8.4. Describe Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease	2
	HP 8.5. Describe Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.	2
	HP 8.6. Describe Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytoma.	2
	HP 8.7. Describe Endocrine Pancreas: Secretory cells, action, regulation secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.	2
9	**Unit 9: Nerve Muscle Physiology**	
	HP 9.1. Discuss Resting membrane potential. Action potential – ionic basis and properties	4
	HP 9.2. Describe Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.	2
	HP 9.3. Describe Neuroglia: Types and functions	2
	HP 9.4. Classify Skeletal muscle Structure	2
	HP 9.5. Discuss the physiology of neuromuscular transmission	2
	HP 9.6. Discuss the applied aspects of neuromuscular disorders.	2

10	**Unit 10: Nervous System**	
	HP 10.1. Describe Organisation of CNS – central and peripheral nervous system.	6
	HP 10.2. Describe Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties	4
	HP 10.3. 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	**5**
	HP 10.4. Discuss Sensory cortex. Somatic sensations: crude touch, fine touch tactile localization, tactile discrimination, stereo gnosis vibration sense,	**4**
	HP 10.5. Describe kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain.	**4**
	HP 10.6. 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.	**2**
	HP 10.7. Describe Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL	**2**
	HP 10.8. Discuss Spinal cord Lesions: Complete transection and Hemi section of the spinal cord.	**2**
	HP 10.9 Describe Cerebellum: Functions. Cerebellar ataxia.	**1**
	HP 10.10. Describe Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.	**1**
	HP 10.11. Describe Functions of Thalamus and Hypothalamus: Nuclei. Thalamic syndrome	**1**
	HP 10.12. Describe Reticular Formation and Limbic System: Components and Functions.	**1**
	HP 10.13. Describe Structures and functions of Basal Ganglia: Parkinson's disease	**1**
	HP 10.14. Describe Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.	**2**
	HP 10.15. Describe Formation, composition, circulation and functions of CSF Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.	**2**
	HP 10.16. Describe Features and actions of parasympathetic and sympathetic nervous system	2
11	**Unit 11: Physiology of Exercise – Explain the Effects of acute and chronic exercise on**	
	HP 11.1 Respiratory	1
	HP 11.2 Cardio vascular	**1**
	HP 11.3 Musculoskeletal system	1
Total hours		180

Practical: B.P.T. Human Physiology 102 Practical: HP (P)

Unit	Content	Practical hours
HP (P) 12.1	Practical classes include	
	1. Hematology experiments	6
	2. Clinical examinations	6
	3. Amphibian chart	6
	4.Recommended demonstrations.	7
HP (P) 12.2	Recommended demonstrations include but are not limited to:	
	i. Differentiate Blood cells	1
	ii. Determine the blood cell counts	1
	iii. Determine Blood groups	2
	iv. Calculate bleeding and clotting time	2
	v. Observe the procedures of common blood investigations	1
	vi. Elicit superficial and deep tendon reflexes	5
	vii. Determine muscle tone	5
	viii. Interpret normal ECG wave pattern	2
	ix. Identify normal breath sound	2
	x. Differentiate Heart sounds including murmurs	2
HP (P) 12.3	Perform the following clinical examination procedures:	
	i. Body Temperature measurement	6
	ii. Pulse rate	6
	iii. Blood Pressure	6
	iv. Oxygen saturation	6
	v. Respiratory rate	6
Total hours		80

Recommended text Book for HP

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 for HP

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: B.P.T. Biochemistry (BC): Lecture (L)

HP 1.0. 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

BC 1.0.1 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)

Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

Assessment Methods (Marks distribution for assessment method for internal assessment not mentioned)

1. MCQs
2. Long and Short Essays

Unit	Course content	Theory hours
1	**Unit 1**	
	BC 1.1. Acid-Base balance	
	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	4

	BC 1.2. Carbohydrate Chemistry –	
	1.Definition, general classification with examples, Glycosides bond	2
	2. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Poly-saccharides.	2
	3. Glycosaminoglycan (mucopoly saccharides)	2
	4. Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.	2
	5. Glycogen metabolism – Glycogenesis, Glyco Geno lysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle Hormonal regulation of glucose, Glycosuria, Diabetes mellitus	2
	6. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers.	2
	BC 1.3. Lipid Chemistry	
	1.Definition, general classification	2
	2. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol	4
	3. Essential fatty acids and their importance	2
	4. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies	2
	5. Role of lipids in diet	2
	BC 1.4. Amino-acid Chemistry	
	1.Amino acid chemistry: Definition, Classification, Peptide bonds	3
	2. Peptides: Definition, Biologically important peptides	3
	3. Protein chemistry: Definition, Classification, Functions of proteins,	3
	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	3
	BC 1.5. 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.	1
	2. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person	1
	3. Balanced diet i. Recommended dietary allowances ii. Nutritional disorders.	2
2	**Unit 2**	
	BC 2.1. Enzymes - 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)	4
	BC 2.2. Nucleotide and Nucleic Acid Chemistry	

	1.Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.	2
	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.	2
	BC 2.3. Vitamins 1.Definition, classification according to solubility,	1
	2. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.	3
	BC 2.4. Mineral Metabolism	
	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.	4
	BC 2.5. Clinical Biochemistry	
	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.	30
Total hours		90

Recommended Text Books for BC

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 & Clincial aspects- Marshall & Bangert- Churchill Linvingstone.

4. Biochemistry Southerland-Churchill Livingstone.

Recommended Reference books for BC

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 CODE - BPT -104

Course Title: B.P.T. FUNDAMENTALS OF EXERCISE MODALITIES (FoEM): Lecture (L): Practical (P)

FoEM 1.0. 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

FoEM 1.0.1 Course Outcomes: Fundamentals of Exercise Modalities

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)

FoEM 1.0.2 Teaching Learning Methods:

1. Lecture

2. Flipped class

3. Video demonstration

4. Demonstration

5. Lab works

FoEM 1.0.3 Assessment Methods: (Marks distribution for assessment method for internal assessment not mentioned)

1. MCQs

2. Long & Short Essay

3. Assignments

4. Viva Voce

5. OSPE

Unit	Course content	Theory hours
1	**Unit 1:Basic principles**	
	FoEM 1.1. 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	10
	FoEM 1.2. 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 inerti	10
	FoEM 1.3. Discuss Muscle work group action of muscles, angle of pull and mechanical efficiency of the muscles.	05
2	**Unit 2: Starting and Derived Positions**	
	FoEM 2.1 Demonstrate the starting positions, their muscle work, effects and uses and Standing, Kneeling, Sitting, Lying and Hanging.	5
	FoEM 2.2 Demonstrate derived positions. Discuss the muscle work of each derived position Measurement of Joint Range	5
	FoEM 2.3 Demonstrate Different methods of measuring range of motion (ROM).	5
	FoEM 2.4 Discuss Reliability and validity of goniometry. Functional ROM and normal range of motion of various joint. Technique of Goniometry.	5
	FoEM 2.5 Perform ROM measurement of individual joint's using goniometer.	5
3	**Unit 3: Muscle testing**	
	FoEM 3.1 Discuss the Principles & Aims, Indications & Limitations, and Techniques of MMT for group & individual testing	5
	FoEM 3.2 Demonstrate Manual Muscle testing procedure	10
	FoEM 3.3 Perform MMT for upper limb, lower limb spine and face muscles	10
4	**Unit 4: Classification of therapeutic exercise**	
	FoEM 4.1. Classify therapeutic exercises: Technique, effects, therapeutic use	2
	FoEM 4.2. Demonstrate Active Movements	1
	FoEM 4.3. Discuss active movements in terms of Definition of strength, power & work, endurance, muscle actions, Causes of decreased muscle performance,	2
	FoEM 4.4. Explain the Physiological adaptation to training: Strength & Power, Endurance.	2
	FoEM 4.5. Demonstrate Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses	2
	FoEM 4.6. Demonstrate Active Assisted Exercise	1

	FoEM 4.7. Discuss the principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses	5
	FoEM 4.8. 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	5
	FoEM 4.9. 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	5
5	**Unit 5**	
	FoEM 5.1 Classify various types of soft tissue manipulation techniques.	2
	FoEM 5.2 Discuss Physiological effects, therapeutic effects and contraindications of soft tissue manipulation.	3
	FoEM 5.3 Describe effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.	10
	FoEM 5.4 Perform effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.	10
Total hours		120

PRACTICAL B.P.T. Fundamentals of Exercise Modalities 104 Practical: FoEM (P)

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)

Unit	Content	Practical hours
FoEM (P) 6.1.	Demonstrate the different types of muscle contraction, muscle work, group action of muscles and co-coordinated movements on self	5
FoEM (P) 6.2.	Demonstrate various fundamental and derived positions. And describe muscle work, and uses on self	5
FoEM (P) 6.3.	Measure the ROM of joints using hand held goniometer – upper limb, lower limb & trunk on human model	10
FoEM (P) 6.4.	Demonstrate the relaxed passive movement of joints of upper limb and lower limb on human model	5
FoEM (P) 6.5.	Instruct the patient to perform of the active mobilisation exercises of joints of upper limb and lower limb on human model	5
FoEM (P) 6.6.	Perform passive mobilisation exercises of different joints region wise on self /human model	10

FoEM (P) 6.7	Demonstrate the testing of muscle strength/ function region wise – upper limb lower limb and trunk On human model	8
FoEM (P) 6.8	Perform all the soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face On human model	10
FoEM (P) 6.9	Demonstration ONLY [to be shown to the student by the teacher] 1. Digital goniometry 2. Pelvic inclinometry 3. Dynamometry 4. Accessory passive movement	2
Total hours		**60**

Recommended Text Books for FoEM

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 for FoEM

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: B.P.T. Fundamentals of Electro Physical Agents (FoEA): Lecture (L): Practical (P)

FoEA 1.0. 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 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

FoEA 1.0.1. Course Outcomes: Fundamentals of Electro Physical Agents

After completion of this course the student shall be able to

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, contraindications 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

FoEA 1.0.2. Teaching learning methods

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

FoEA 1.0.3. Assessment methods

1. MCQs

2. Long & Short Essay

3. Viva Voce

4. OSPE

Unit	Course content	Theory hours
1	**Unit 1**	
	FoEA 1.1. Physical Principles In Relation to Physiotherapy:	15
	1. Structure and Properties of matter-solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity. Structure of atoms, molecules, elements and compounds, election theory, static and current electricity.	4
	2. Conduction, Insulators, Potential difference, Resistance and Intensity. Ohm's Law its application to AC and DC currents.	4
	3. Rectifying Devices-Thermionic valves, semiconductors, Transistors, Amplifiers, Transducers, Oscillator Circuits. Capacitance, Condensers in DC and AC circuits.	4
	4. Display devices and indicators-analogue & digital.	3
	FoEA 1.2. Effects of Current Electricity	15
	1. Chemical effects- ions and electrolytes, ionization, production of E.M.F by chemical actions. Magnetic effects, Molecular theory of Magnetism. Magnetic fields, electromagnetic induction.	4
	2. Milli ammeter and voltmeter, transformers and chose coil, thermal effects-joules law and heat production.	3
	3. Physical principles of light and its properties.	2
	4. Physical principles of sound and its properties.	2
	5. Electromagnetic spectrum-biophysical application.	4
	FoEA 1.3. Electrical Supply	15
	1. Brief outline of main supply of electric current. Dangers short circuits, electric shocks.	7
	2. Precautions safety devices, earthing, fuses etc. First and initial management of electric shock.	8
2	**Unit 2**	
	FoEA 2.1. Low Frequency Currents Introduction to direct, alternating and modified currents.	25
	1. **Iontophoresis:** Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation.	5
	2. **Faradic current**: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation	5
	3. **Interrupted direct current**: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation	5
	4. **Transcutaneous Electrical Nerve Stimulations (TENS)** Types of low frequency, pulse widths, frequencies and intensities used as TENS applications, Theories of pain relief by TENS. Principles of clinical application, effects and uses, indications, contraindications, precautions. Operational skills of equipment patient preparation.	10
3	**Unit 3**	
	FoEA 3.1. Electrical Reactions and Electro-Diagnostic Tests	20
	1. Electrical stimuli and normal behavior of nerve and muscle tissue. Types of lesions and development of reaction of degeneration.	4
	2. Faradic/Intermittent direct current test.	6
	3. S.D. Curve and its application. Chronaxie, Rheobase and pulse ratio.	10

4	**Unit 4**	
	FoEA 4.1. 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.	15
	FoEA 4.2. 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.	15
Total hours		**120**

PRACTICAL B.P.T. Fundamentals of Electro Physical Agents 105 Practical : FoEA (P)

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)

Unit	Content	Practical Hours
FoEA (P) 5.1.	Identify components and safety devices involved in electric supply of the electrotherapy department.	5
FoEA (P) 5.2.	Experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.	10
FoEA (P) 5.3.	Locate and stimulate different motor points region wise including the upper & lower limb, trunk face. On human model	10
FoEA (P) 5.4.	Demonstrate the application of special techniques of low frequency current including Faradic foot bath, faradism under pressure	10
FoEA (P) 5.5.	Demonstrate the application of techniques of Iontophoresis.	2
FoEA (P) 5.6.	Demonstrate the plotting of strength duration curve and find out Chronaxie and Rheobase.	10
FoEA (P) 5.7.	Demonstrate the techniques of application of various types of IR lamps to various body regions.	5
FoEA (P) 5.8.	Demonstrate the techniques of application of paraffin wax bath to various body regions	5
FoEA (P) 5.9.	Demonstrate the techniques of application of TENS to various body regions	3
Total hours		**60**

Recommended Text Books for FoEA

1. Electro therapy Explained: Principles & Practice Low& Reed, Butterworth Heinemann.

2. Claytons Electro therapy, Forster & Palastange Baillier Tindal.

Recommended reference books for FoEA

1. Principles & Practice of Electrotherapy, Kahn, Churchill Livingstone

2. clinical electrotherapy Currier and nelson

3. Therapeutic Heat & Cold, Lehmann, Willians & Wilkins.

Course Title 106

COURSE TITLE- PSYCHOLOGY AND SOCIOLOGY: (PSY) and (SOC) Theory (L)

SECTION A

Course Title: Psychology (PSY)

PSY 1.0. 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. PSY 1.0.1. Course Outcomes: After completion of this course the student shall be able to General and Clinical Psychology

Describe the principles of psychology and it 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)

Unit	Course content	Theory hours
1	**Unit 1**	
	PSY 1.1. Introduction to Psychology	
	1. Describe Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.	3
	2. Describe Methods: Introspection, observation, inventory and experimental method.	2
	3. Describe in brief Branches: pure psychology and applied psychology.	2
	4. Describe importance of study of Psychology to physiotherapy.	3
2	**Unit 2**	
	PSY 1.2. Developmental Psychology	
	1. Describe Growth and Development Nature of growth and development, Characteristics of growth and development, Developmental periods of infancy.	4
	2. Describe Childhood, adolescence, adulthood and old age, Factors affecting growth and development.	3
	3.Describe Role of heredity and environment and their relative importance in physical, psychological and social development	3
3	**Unit 3**	
	PSY 1.3. Emotions and perception	
	1. Describe Emotions Concept and definition, Theories of emotions, Physiological changes due to emotional state. Nature and control of anger, fear and anxiety.	2
	2. Describe Sensation, attention and perception Meaning and definition.	1
	3. Describe Types of sensation and Perception.	1
	4. Describe Principles of Perception. Illusion and hallucination concept of attention and Factors determining attention	3
4	**Unit 4**	
	PSY 1.4. Motivation and Learning	
	1. Definition, needs, drives and motives, primary motives and secondary motives, Achievement motivation.	1
	2. Discuss the theories of motivation.	2
	3.Describe theories of Learning	2
	4. Describe Concepts, Characteristics, Types, Laws of Leaning, Theories of learning, Trial and Error theory	2
	5. Describe Conditioning-classical and operant, Insight theory of learning, Factors influencing learning.	2
	6.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.	2
	7. Describe Intelligence; Discuss Characteristics, Types. IQ. Mental age.	1
	8.Describe Assessment of intelligence, intelligence tests-verbal and performance test	1
5	**Unit 5**	
	PSY 1.5. Psychology of frustration and Stress	
	1.Describe Frustration and stress under the following headings: Definition. Causes, Sources of frustrations, Conflict, Different types of conflicts, Adjustment and maladjustment. Defense Mechanism.	3

	2.Describe Different types of Anxiety, Tension, Physiological symptoms, causes reactions to stresses, psycho-somatic problems, copying strategies.	3
	3. Discuss the management of stress	4
6	**Unit 6**	
	PSY 1.6. Personality	
	1. Define Personality and describe factors in personality development	3
	2. Describe tools of Measurement of Personality-: observation, situational test, questionnaire, rating scale, interview, and projective techniques.	3
	3.Describe Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.	3
	4. 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.	3
7	**Unit 7**	
	PSY 1.7. Social psychology	
	1. Describe Different types of leaders and Different theoretical approaches to leadership.	4
	2. Describe development of attitude and change of attitude.	4
8	**Unit 8**	
	PSY 1.8. Clinical psychology	
	1.Describe Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression,	5
	2. Discuss the following i Self-imaging ii. stress management iii. assertive training iv. Group therapy v. Body awareness vi. Pediatric, child and geriatric clinical psychology.	10
Total hours		85

SECTION B

Course Title: Sociology (SOC)

SOC 1.0. 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 dis- ability. 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.

SOC 1.0.1. Course Outcomes:

After completion of this course the student shall be able to Sociology

1. Discuss the sociological concepts in relations to health, healthcare, and disorders.(KH)
2. Explain social theories in relations to health and health care.(KH)
3. Discuss biomedical and biopsychosocial health models.(KH)
4. 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)
5. 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
6. Analyse the social cause for activity limitations and participatory restrictions caused by various disorders.(KH)

SOC 1.0.2. Teaching Learning Methods:

1. Lecture
2. Case studies
3. Field visit
4. Role play
5. Debate
6. Panel discussions

SOC 1.0.3. Assessment Methods:

1. Short Essay
2. Assignment
3. Presentations
4. Debate

Unit	Course content	Theory hours
1	**Unit 1**	
	SOC 1.1- Introduction to sociology	1
	SOC 1.2 - Meaning- Definition and scope of sociology	1
	SOC 1.3 -Its relation to Anthropology, Psychology, Social Psychology.	1
	SOC 1.4 - Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.	2
	SOC 1.5 - Importance of its study with special reference to Health Care Professionals.	1
	SOC 1.6. - Social Factors in Health and disease situations: 1. Meaning of social factors 2. Role of social factors in health and illness	2
	SOC 1.7- Socialization: 1. Meaning and nature of socialization. 2. Primary, Secondary and Anticipatory socialization. 3. Agencies of socialization.	2

	SOC 1.8 - Social Groups Family 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.	2
	SOC 1.9 - Family 1. The family, meaning and definitions. 2. Functions of types of family 3. Changing family patterns 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.	3
2	**Unit 2**	
	SOC 2.1 - 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.	5
	SOC 2.2 – Culture and Health 1. Concept of Health 2. Concept of Culture 3. Culture and Health 4. Culture and Health Disorders	4
	SOC 2.3 - 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.	5
	SOC 2.4 - Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to pre- vent 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.	5

	SOC 2.5. Social Security: Social security and social legislation in relation to the disabled.	1
Total hours		**35**
Total hours (Section A & B)		**120**

Recommended Text Books for PSY

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. Development psychology. McGraw-Hill;

4. Clinical Psychology –Akolkar Hurlock EB.

Recommended reference books for PSY

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 councelling and psychotherapy a case approach Murdock nl person education New Zealand

7. Theories of personality. Hall CS, Lindzey G Wiley and sons inc

Recommended Text Books for SOC

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 for SOC

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

CODE BPT 107

Course Title- Fundamentals of Health Care Delivery System In India Introduction To National Healthcare Delivery System In India: (Fohc) : Theory (L)

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

Unit	Course content	Theory hours
FoHC 1.1.	Introduction to healthcare delivery system	5
FoHC 1.2	Healthcare delivery system in India at primary, secondary and tertiary care	5
FoHC 1.3.	Community participation in healthcare delivery system	5
FoHC 1.4.	Health system in developed countries.	5
FoHC 1.5.	Private Sector	5
FoHC 1.6.	National Health Mission	5
FoHC 1.7.	National Health Policy	5
FoHC 1.8.	Issues in Health Care Delivery System in India	5
Total hours		**40**

SECTION- B

Unit	Course content	Theory hours
FoHC 1.9.	National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.	10
FoHC 1.10.	Health scenario of India- past, present and future	5
FoHC 1.11.	Introduction to the profession of physiotherapy role of physiotherapy in national health issues and the expectations of society from physiotherapists	5
FoHC 1.12	The concepts of health and disease, risk factors, and the role of health promotion and disease prevention	10
FoHC 1.13	Explore the corporatization of health care.	5
FoHC 1.14.	Identify the globalisation of health care.	5
FoHC 1.15.	Assess the prospects of new health care reform.	5

FoHC 1.16	Understand various types of health services professionals and their training, practice requirements, and practice settings.	10
FoHC 1.17	Differentiate between primary care and specialty care, and identify the causes of the imbalance between primary care and specialty care	10
FoHC 1.18	Study the role of health care financing and its impact on the delivery of health care.	5
FoHC 1.19.	Understand the basic concept of insurance and how general insurance terminology applies to health insurance.	10
Total hours		**80**
Total hours (Section A & B)		**120**

COURSE CODE BPT 108

COURSE TITLE - ENGLISH, COMMUNICATION AND SOFT SKILLS: (EG) : Theory (L)

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: 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

SECTION- A

Unit	Course content	Theory hours
EG 1.1.	Basic Language Skills: Grammar and Usage.	4
EG 1.2.	Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.	5
EG 1.3.	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.	10
EG 1.4.	Basic concepts & principles of good communication	5
Total Hours		**24**

SECTION- B

Unit	Course content	Theory hours
EG 1.5	Special characteristics of health communication Types & process of communication – verbal, non-verbal and written communication.	10
EG 1.6	Upward, downward and lateral communication.	6
EG 1.7	Therapeutic communication: empathy versus sympathy	6
EG 1.8	Communication methods for teaching and learning	5
EG 1.9	Communication methods for patient education	4
EG 1.10	Barriers of communication & how to overcome.	5
Total Hours		**36**
Total Hours (Section A & B)		**60**

Note: 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.

COURSE CODE- 109

COURSE TITLE- COMPUTERS AND INFORMATION SCIENCE : (IT): Theory (L), Practical (P)

IT 1.0. 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.

IT 1.0.1. Course outcomes

1. To know the parts of computer

2. To have working knowledge of a computing system

3. Use computer for word processing and presentation and data management

4. Use the internet for personal and professional purpose

5. Understand the role of digital technology in the Health sciences

Unit	Course content	Theory hours
IT 1.1	**Introduction to computer:** Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages	5

IT 1.2	**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).	5
IT 1.3.	**Processor and memory:** The Central Processing Unit (CPU), main memory	5
IT 1.4	**Storage Devices:** Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.	5
IT 1.5.	**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.).	5
IT 1.6	**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.	5
IT 1.7	**Introduction to Excel:** introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.	5
IT 1.8.	**Introduction to power-point:** introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs/ photos/ Videos.	5
IT 1.9.	**Introduction of Operating System:** introduction, operating system concepts, types of operating system.	5
IT 1.10.	**Computer networks:** introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.	5
IT 1.11	**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.	5
IT 1.12.	Application of Computers in clinical settings	5
	Total hours	60

PRACTICAL: B.P.T. IT 109 (P)

IT (P) 2.1. 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

Note: Practical content is provided but hours are not defined

Note: 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.

Course Code: B.P.T 110: CLINIC ORIENTATION AND VISIT (Cor)

COr 1.0. 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.

COr 1.1. 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.

COr 1.2. 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

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2ND YEAR B.P.T.

Course Code: B.P.T-201

SUBJECT DESCRIPTION: COURSE TITLE - PATHOLOGY AND MICROBIOLOGY (PM): Theory (L) Practical (P)

PM 1.0. 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.

PM 1.0.1. Course Outcomes: Course 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)

PM 1.0.2. Teaching – Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

PM 1.0.3. Assessment Methods

1. MCQs
2. Assignments
3. Short Essays
4. Long essay

Course Contents: B.P.T. PM 201 (L)

SECTION A

UNIT 1

PM 1.1. Discuss the Causes of disease, cell injury

PM 1.2. Describe the mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene

PM 1.3. Explain the pathology inflammation

PM 1.4. Differentiate acute and chronic inflammation

PM 1.5. Explain the process of primary healing, secondary healing

PM 1.6. Discuss the factors affecting healing and repair of soft tissues and skin.

UNIT 2

PM 2.1. Describe Fluid and hemodynamic derangements

PM 2.2. Discuss the pathophysiology of edema, hyperemia, Hemorrhage, shock, embolism, thrombosis, and infarction

PM 2.3. Discuss Immune mechanisms (natural and acquired)

PM 2.4. Discuss the features of autoimmune diseases and immunodeficiency diseases.

PM 2.5. Discuss the characteristic of benign and malignant tumors

PM 2.6. Describe grading and staging of malignant tumors

PM 2.7. Describe general effects of malignancy on the host

PM 2.8. Outline the carcinogenic agents

PM 2.9. Outline the methods of diagnosis of malignancy

PM 2.10. Classify the Nutritional disorders

PM 2.11. Discuss the deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E,K) iodine deficiency)

PM 2.12. Discuss the effect of nutrition deficiency on skeletal muscles, bones and neurological functions

PM 2.13. Describe the hypersensitivity reactions

UNIT 3

PM 3.1. Discuss the causative factors, pathology, clinical features, diagnosis and management of Disorders of blood

1. Discuss the causative factors, pathology, clinical features, diagnosis and management of Disease of circulatory system (atherosclerosis,
2. Thromboangitis obliterans, varicose vein, DVT, thrombophlebitis, lymphedema, congestive cardiac failure, rheumatic heart disease,)
3. Explain the causative factors, pathology, clinical features, diagnosis and management of ischemic heart disease
4. Explain the causative factors, pathology, clinical features, diagnosis and management of Congenital Heart disease.
5. 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)
6. 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.)

PM 3.2. 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)

PM 3.3. Describe the causative factors, pathology, clinical features, diagnosis and management of Diseases endocrine system. (Diabetes Mellitus, Thyroiditis, Thyrotoxicosis, myxedema.)

PM 3.4. Describe the causative factors, pathology, clinical features, diagnosis and management of the Disorders of blood (anemias, Leukemia)

1. 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

PM 4.1. Discuss the type, source and mechanism of Infection

PM 4.2. Describe the prevention and management of common infections

PM 4.3. Describe the causative factors, and pathology of common Infectious diseases:

PM 4.4. Outline of the management of common infective diseases

PM 4.5. 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)

PM 4.6. Describe the causative factors, pathology, clinical features, diagnosis and management of viral diseases: (Poliomyelitis, Herpes, Rabies, Measles, Rickets, Chlamydial infection, HIV infection. Chicken Pox, Measles, Mumps, Influenza)

PM 4.7. Describe the causative factors, pathology, clinical features, diagnosis and management of Fungal and opportunistic infections.

PM 4.8. Describe the causative factors, pathology, clinical features, diagnosis and management of: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

Recommended Text Books for PM

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 for PM

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 (PC): Theory (L)

PC 1.0. 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.

PC 1.0.1. Course Outcomes: Course 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)

PC 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

PC 1.0.3. Assessment Methods:

1. MCQs
2. Assignments
3. Short Essays
4. Long essay

Course Contents: B.P.T. PC 202 (L)

SECTION -A

Unit 1:

PC 1.1. **General Pharmacology**

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

PC 1.2. Inflammatory/Immune Diseases -

1. Describe Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non aspirin NSAIDs, drug Inter- actions with NSAIDs
2. Discuss Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
3. Discuss Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout

PC 1.3. Discuss Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease

UNIT 2: Autonomic Nervous system

PC 2.1. Describe General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System

PC 2.2. Discuss cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

Cardiovascular Pharmacology –

PC 2.3. Describe Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors

1. Describe Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
2. Describe Antiarrhythmic Drugs
3. Discuss the Drugs used in the treatment of vascular disease and tissue ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics

PC 2.4. 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:

PC 3.1. Neuropharmacology

1. Discuss Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
2. Describe Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
3. Discuss Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
4. Describe Antipsychotic drugs

PC 3.2. Disorders of Movement -

1. Discuss Drugs used in Treatment of Parkinson ’s disease
2. Describe Antiepileptic Drugs
3. Discuss Spasticity and Skeletal Muscle Relaxants

PC 3.3. Discuss Respiratory Pharmacology and Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

UNIT 4

PC 4.1. Describe Gastrointestinal Pharmacology and drugs used in Peptic Ulcer Disease, Constipation, and Diarrhea Drugs

PC 4.2. Describe Hormones and drugs affecting endocrine functions Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

Geriatrics -

PC 5.1. Discuss the adverse effects of special concern in the Elderly, Dementia, and Postural hypotension.

PC 5.2. Describe chemotherapeutic agents

Recommended Text Books for PC

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 for PC

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

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Course Code: 203

Course Title: Public Health & Health Promotion (PH): Theory (L)

PH 1.0. 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.

PH 1.0.1. 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.

Course Contents: B.P.T. PH 203 (L)

SECTION -A

Unit 1

PH 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,

PH 1.2. 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.

PH 1.3. 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, 0besity, Blindness, Accidents and Injuries.

Unit 2

PH 2.1. 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.

PH 2.2. 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.

PH 2.3. 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.

PH 2.4. 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

PH 3.1. **Nutrition and Health:** Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes.

PH 3.2. **Environment and Health:** Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.

PH 3.3. **Hospital waste management:** Sources of hospital waste, Health hazards, Waste management.

PH 3.4. **Disaster Management:** Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.

Unit 4

PH 4.1. **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.

PH 4.2. **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 Intellectual Disability.

PH 4.3. **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.

PH 4.4. **Exercise as Preventive Medicine:** for Old age, Working Population, Adolescents and Children. How to keep your Society fit.

Recommended text books for PH

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 for PH

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.

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COURSE CODE 204

Course Title: Basics of Emergency Care and Life Support Skills (ECLS): Theory (L) Practical (P)

ECLS 1.0. 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 auto- mated 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 knowledge and skill besides the lecture - demonstrations.

ECLS 1.0.1. 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.

Course Contents: B.P.T. ECLS 204 (L)

SECTION -A

UNIT 1

ECLS 1.1. Emergent conditions and magnitude, Concept of golden hour, Duties and responsibilities of first responder

ECLS 1.2. Ethical issues and Gather information from observation, experience and reasoning. Identification of rapidly changing situations and adapt accordingly. Planning and organization of work. Scene safety. Dealing with emotional reactions family members and bystanders

ECLS 1.3. Well-being of first responder Personal protection

1. Steps to be taken against airborne and blood-borne pathogens
2. Personal protective equipment necessary for each of the following situations: Hazardous materials Rescue Operations Violent Scenes Crime scenes
3. Electricity, Water and ice
4. Exposure to blood-borne pathogens Exposure to airborne pathogens

UNIT 2

ECLS 2.1. Airway

1. Signs of inadequate breathing
2. Mechanism of injury to opening the airway
3. Steps in the head-tilt chin-lift
4. Steps in the jaw thrust
5. Taking out foreign body
6. Ensuring patent airway during seizures and vomiting.

ECLS 2.2. Ventilation

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

ECLS 2.3. Circulation

1. Evaluate the cardiac status of the patient
2. Determine the need for and take necessary action to proper circulation
3. Steps for control of bleeding: Pressure bandage and tourniquet

ECLS 2.4. Clearing a foreign body airway obstruction

ECLS 2.5. CPR

1. Implications of cardiac arrest
2. Cardiopulmonary resuscitation (CPR)
    i. How it works
    ii. Steps
    iii. When to stop CPR
3. Brief overview of AED Automated external defibrillator (only demonstration –no hands on)

SECTION -B

UNIT 3

ECLS 3.1. Bleeding and Soft Tissue Injuries

1. Difference between arterial and venous bleeding
2. Stopping external bleeding
3. Identification of Internal bleeding
4. types and Functions of dressings and bandages
5. How to help a victim of burn injury

ECLS 3.2. Injuries to Muscles and Bones

1. Suspecting bony/spinal injury
2. Splinting –materials used
3. Importance of splinting

UNIT 4

ECLS 4.1 Medical Emergencies

ECLS 4.2

1. Identification of the patient steps in providing first aid to a patient with
    i. A general medical complaint –Seizures
    ii. Chest-pain
        a. Shortness of breath
        b. Exposure to heat
        c. Including other medical complaints like allergy, diarrhea, fainting, low blood sugar, stroke

2. Drowning

3. Poisoning

ECLS 4.3 Transportation Importance of timely and proper transportation methods of transportation of victim from site of injury to ambulance. Importance of spine protection methods of spine protection during transportation

ECLS 4.4 Disaster preparedness -. Preparedness and risk reduction Incident command and institutional mechanisms Resource management

Practicals B.P.T. ECLS 204 (P)

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

ECLS (P) 5.1. Provide Airway & Ventilation

ECLS (P) 5.2. Perform Basic Life Support: CPR

ECLS (P) 5.3. Perform Initial management of Thermal injury, electric injury

ECLS (P) 5.4. Perform stabilizing injured extremity and wound management

ECLS (P) 5.5. Demonstrate bandaging techniques to various body parts

ECLS (P) 5.6. Demonstrate Extrication, Helmet removal and spine protection

ECLS (P) 5.7. Demonstrate Stretcher use

Recommended text books for ECLS

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 (ExT): Theory (L) Practical (P)

ExT 1.0. 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 fundamental concepts taught in the first year such as relaxation, suspension therapy, hydrotherapy, manual therapy, aerobic exercises functional re-education 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

ExT 1.0.1. Course Outcomes: Exercise Therapy

1. Explain the physiological effects of endurance, strengthening, balance and coordination effects on various systems. (KH)
2. Differentiate types of exercise based on the therapeutic effects. (SH)
3. Discuss the indications, contraindications and precautions to be taken while performing
    i. Passive Range of Motion
    ii. Active Range of Motion
    iii. Assisted exercises
    iv. Endurance exercise
    v. Strengthening exercise
    vi. Balance and coordination exercise
4. Demonstrate competencies in prescribing
    i. Passive Range of Motion
    ii. Active Range of Motion
    iii. Assisted exercises
    iv. Endurance exercise
    v. Strengthening exercise
    vi. Balance and coordination exercise
5. Prescribe therapeutic exercise based on the assessment findings. (SH)

6. Demonstrate competencies in preparing and implementing evidence-based exercise protocol for movement impairments under supervision. (SH)
7. Demonstrate abilities to document the dosage and progression as per the prescribed format (SH)
8. Communicate the exercise protocol effectively to the stakeholders. (SH)

ExT 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorials
3. Demonstration
4. Performance under supervisor
5. Lab work

ExT 1.0.3. Assessment Methods:

1. MCQs
2. Structured Essay
3. OSPE

Course Contents: B.P.T. ExT 205 (L)

SECTION-A

UNIT 1

ExT 1.1. RELAXATION

1. 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,
2. Discuss the Indications of relaxation, Methods & techniques of relaxation-Principles & uses:
3. Demonstrate General, Local, Jacobson's, Mitchel's, additional methods

ExT 1.2. SUSPENSION THERAPY:

1. Discuss the principles, indications, contraindications and benefits of suspension therapy
2. Demonstrate types of suspension therapy – axial, vertical, pendulum; techniques of suspension therapy for upper limb & lower limb

ExT 1.3. FUNCTIONAL RE-EDUCATION

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

ExT 1.4. POSTURE

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

ExT 1.5. BREATHING EXERCISES:

1. Describe normal breathing
2. Discuss types, techniques, indications, contraindications, therapeutic effects and precautions of breathing exercises
3. Perform Chest expansion measurement and evaluation

ExT 1.6. Group Exercises

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

Unit 2

ExT 2.1. STRETCHING

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

ExT 2.2. MANUAL THERAPY & PERIPHERAL JOINT MOBILIZATION

1. Discuss Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan
2. Discuss Biomechanical basis for mobilization,
3. Explain the Effects of joint mobilisation, in terms of Indications and contraindications, Grades of mobilization, Principles of mobilization

4. Identify red flags for mobilisation
5. Perform mobilization for upper limb lower limb, and spine
    i. Demonstrate clinical reasoning skills in selection and application of manual therapy techniques
    ii. Demonstrate skills in examining joint integrity, contractile and non-contractile tissues
    iii. Identify accessory movements and end feel
    iv. Demonstrate Assessment of articular & extra-articular soft tissue status
    v. Myofascial assessment
    vi. Acute & Chronic muscle hold
    vii. Tightness
    viii. Pain-original & referred
6. Discuss the principles, Indications, Contra-Indications and evidence for schools of mobilization (Maitland, Mulligan, McKenzie, Muscle Energy Technique, Myofascial stretching, Cyriax, Neuro Dynamics)
7. Discuss the Principles, physiological and therapeutic effects of traction
8. Discuss the types, indications, contraindications for traction
9. Perform manual and mechanical tractions

Section B

Unit 3

ExT 3.1. THERAPEUTIC GYMNASIUM:

1. Identify the equipment used in the therapeutic gymnasium
2. Discuss the usage of identified equipment
3. Demonstrate skills in handling the equipment

ExT 3.2. AEROBIC EXERCISE

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

ExT 3.3. CO-ORDINATION EXERCISE

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

Unit 4

ExT 4.1. MOTOR LEARNING AND FUNCTIONAL RE-EDUCATION:

1. Describe Motor Learning:
2. Classify of Motor skills
3. Discuss the methods of Measurement of Motor Performance
4. Discuss the Theories of motor control and its application

ExT 4.2. Discuss Learning under the following headings

1. Learning Environment:
2. Learning of skill
3. Instruction and augmented feedback Practice Conditions

ExT 4.3. Proprioceptive Neuromuscular Facilitation

1. Definitions & goals
2. Explain the neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb
3. Demonstrate skills in performing PNF components (timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal)
4. Demonstrate the following PNF techniques, Procedure: components of PNF
5. Demonstrate skills in performing PNF components (timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal)
6. Demonstrate the following PNF techniques
    i. Mobility: Contract relax, Hold relax, Rhythmic initiation
    ii. Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization

ExT 4.4. WALKING AIDS

ET 7.1. Identify different types of walking aids (Crutches, Canes, Frames)

ET 7.2. Discuss Principles of prescribing walking aids

PRACTICAL: B.P.T. ExT 205 (P)

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

ExT (P) 5.1. Demonstrate the PNF techniques – patterns [upper limb lower limb trunk], special techniques

ExT (P) 5.2. Demonstrate preparation for relaxation training

ExT (P) 5.3. Measure chest expansion and demonstrate various breathing exercises

ExT (P) 5.4. Demonstrate exercises for training co-ordination – Frenkel's exercise

ExT (P) 5.5. Demonstrate techniques for functional re-education lying to side lying, lying to sitting, sitting to standing

ExT (P) 5.6. Assess and train for using walking aids axillary crutch [3 point, 2 point 4-point gait}, elbow crutch walker

ExT (P) 5.7. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles

ExT (P) 5.8. Demonstrate the techniques for muscle stretching

ExT (P) 5.9. Assess and evaluate posture and gait

ExT (P) 5.10. Design and conducts aerobic training programme

ExT (P) 5.11. Demonstrate techniques of strengthening muscles using resisted exercises

ExT (P) 5.12. Demonstrate techniques for measuring limb length and body circumference

Observation [Demonstration by the teacher]

ExT (P) 5.13. Techniques of hydrotherapy in hydrotherapy pool

ExT (P) 5.14. Special techniques of relaxation

Recommended Text Books for ExT

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 for ExT

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.

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
राष्ट्रीय सहबद्ध और स्वास्थ्य देखभाल व्यवसाय आयोग
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COURSE CODE BPT 206

Course Title: Electrotherapy (ET): Theory (L) Practical (P)

ET 1.0. 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 imparting 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.

ET 1.0.1. Course Outcomes: **Electrotherapy**

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)

ET 1.0.2. Teaching Learning Methods Assessment

1. Demonstration
2. Performance under supervisor
3. Lab work

ET 1.0.3. Assessment Methods

1. OSPE
2. MCQs
3. Short and Long Essay
4. Assignment

Course Contents: B.P.T. ET 206 (L)

Unit 1:

Introduction

ET 1.1. Explain the Physiological responses to heat gain or loss on various tissues of the body.

ET 1.2. Discuss the Physical principles of electromagnetic radiation.

ET 1.3. Discuss the Physics of sound including characteristics and propagation.

ET 1.4. Rationalize the use of electro physical agents as appropriate to the stage of healing

Unit 2:

Therapeutic Ultrasound

ET 2.1. Explain the mechanism of Production, biophysical effects, types, therapeutics types, indication, and contraindication, precautions, of therapeutic Ultra sound.

ET 2.2. Calculate dosage of ultrasound for various structures and types of injuries

ET 2.3. Demonstrate the skills in application of Therapeutic ultrasound

ET 2.4. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

UNIT 3 –

Therapeutic LASER

ET 3.1. Discuss the historical background and physical principles of LASER.

ET 3.2. Classify LASER

ET 3.3. Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of LASER therapy

ET 3.4. Calculate dosage of LASER for various structures and types of injuries

ET 3.5. Demonstrate the skills in application of LASER

ET 3.6. Demonstrate the skills in handling the equipment including preparation, maintenance and safety

ET 3.7. Discuss the current evidence pertaining to LASER therapy

Unit 4:

Therapeutic Cold (Cryotherapy)

ET 4.1. Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of cryotherapy

ET 4.2. Demonstrate the skills in application of cryotherapy

ET 4.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety

ET 4.4. Discuss the current evidence pertaining to cryotherapy

Unit 5:

Therapeutic mechanical pressure (Intermittent Compression Therapy)

ET 5.1. Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of intermittent compression therapy

ET 5.2. Demonstrate the skills in application of compression therapy

ET 5.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

ET 5.4. Discuss the current evidence pertaining to intermittent compression therapy

Unit 6:

Shockwave therapy

ET 6.1. Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of shockwave therapy

ET 6.2. Demonstrate the skills in application of shockwave therapy

ET 6.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

ET 6.4. Discuss the current evidence pertaining to intermittent shockwave therapy

Unit 7:

ET 7.1. Case Discussion on EPA: Design a management protocol for a client with identified impairments, activity limitations and participatory restrictions.

Unit-8

ET 8.1 TENS: a) Definition b) Theories of pain modulation emphasizing on “Pain Suppression System”, c) Types of TENS d) Techniques of application e) Types of Electrodes & Placement of Electrodes f) Physiological Effects and therapeutic uses g) Indication and contra –indications

ET 8.2 Interferential current: Definition, characteristics, physiological & therapeutic effects of Interferential current, techniques of application, indications, contra-indications and precautions Russian Currents Parameters, technique of application, effects and uses, Indications and Contraindications Rebox currents Parameters, technique of application, effects and uses, Indications and Contraindications

ET 8.3 Bio-feedback: a) Introduction b) Principles of bio-feedback c) Therapeutic effects of bio-feedback d) Different types of biofeed back e) EMG biofeedback f) Positive and negative feedback g) Technique of application h) Indications and contra-indications

ET 8.4 Combination therapy: a) Principles, b) Therapeutic uses and indications like, Ultrasound therapy with stimulation or TENS etc.

ET 8.5 Short Wave Diathermy (SWD): a) Introduction b) Physiological effects and Therapeutic effects of SWD c) Methods of application (capacitor field method and cable method etc.) d) Techniques of treatment, indication, contra-indications and dangers.

ET 8.6 Pulsed SWD: a) Definition b) Characteristics c) Mechanism of work d) Physiological effects and therapeutic effects e) Indications, techniques of application f) Principles of treatment and contra-indications

ET 8.7 Hydrotherapy: a) Properties of water buoyancy b) Effects of buoyancy on movement c) Hubbard tank d) Contrast bath, e) Whirlpool bath

ET 8.8 Recent advances in Electro-physiotherapy: a) High power class IV LASER b) Shockwave c) PEMF (Pulse Electro Magnetic Energy), High Intensity Magnetotherapy d) Spinal Decompression, e) Pneumatic Compression therapy f) Functional Electrical Stimulation g) TECAR Therapy h) Cold air cryotherapy i) Virtual and Augmented Reality j) Brief idea about Robotic therapy

Recommended Text Books for ET

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 for ET

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- (BK): Theory (L)

BK 1.0. 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.

BK 1.0.1. Course Outcomes: Biomechanics and Kinesiology

After completion of this course the student shall be able to

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)

BK 1.0.2. Teaching Learning Methods :

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

BK 1.0.3. Assessment Methods :

1. MCQs
2. Long & Short Essays
3. Assignments
4. Viva Voce
5. OSCE

Course Contents: B.P.T. BK 207 (L)

Unit 1:

BK 1.1. Basics of Bio-mechanics: Discuss the basic Concepts in Biomechanics: Kinematics and Kinetics in following terms

1. Types of Motion
2. Location of Motion
3. Direction of Motion
4. Magnitude of Motion
5. Definition of Forces
6. Force of Gravity
7. Reaction forces
8. Equilibrium
9. Objects in Motion
10. Force of friction
11. Concurrent force systems
12. Parallel force system
13. Work
14. Moment arm of force
15. Force components
16. Equilibrium of levers

BK 1.2. Introduction to Biomechanical Analysis:

1. Discuss the techniques of biomechanical analysis
2. Explain the importance of biomechanical analysis

BK 1.3. Explain Joint structure and Function in terms of

1. Joint design
2. Materials used in human joints
3. General properties of connective tissues
4. Human joint design
5. Joint function
6. Joint motion
7. General effects of disease, injury and immobilization.

BK 1.4. Discuss Muscle structure and function -

1. Mobility and stability functions of muscles
2. Elements of muscle structure
3. Muscle function
4. Effects of immobilization, injury and aging

Unit 2

BK 2.1. Biomechanics of spine: Discuss the Biomechanics of Cervical spine, Lumbar Spine and Pelvic complex in terms of

1. Structure and function of cervical spine,
2. Factors responsible for stability of cervical spine
3. Movements of cervical spine.
4. Structure and function of lumbar spine,
5. Factors responsible for stability of lumbar spine
6. Movements of lumbar spine.
7. Structure and function of pelvic complex- Sacro-iliac Joint, Sacrum, symphysis pubic joint and lumbo sacral joint

BK 2.2. Analyse the movement of spine

BK 2.3. Identify the abnormal movements of Spine

Unit: 3

BK 3.1. **Biomechanics of the Thorax and Chest wall -** Discuss Biomechanics of the Thorax and Chest wall in terms of

1. General structure and function
2. Rib cage and the muscles associated with the rib cage
3. Ventilator motions: its coordination and integration
4. Developmental aspects of structure and function
5. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD
    i. Identify the abnormal movements of thoracic cage
    ii. Discuss the mechanics of abnormal thoracic movement
    iii. Describe the Temporomandibular Joint in terms of General features, structure, function and dysfunction
    iv. Discuss the mechanics of abnormal TMJ movements

Unit 4:

BK 4.1. Biomechanics of the upper extremity joints -

1. Explain the shoulder complex in terms of Structure and components of the shoulder complex and their integrated function
2. Identify the normal and abnormal movements of shoulder
3. Discuss static and dynamic stability of Shoulder
4. Describe the common abnormalities of shoulder movement
5. 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.
6. Identify the normal and abnormal movements of elbow joint
7. Describe the common abnormalities of elbow movement
8. 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.
9. Identify the normal and abnormal movements of wrist complex
10. Describe the common abnormalities of wrist complex

Unit 5:

BK 5.1. Biomechanics of the lower extremity joints

1. Explain The hip complex in terms of : structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur
2. Identify the normal and abnormal movements of Hip joint
3. Discuss stability of Hip
4. Describe the common abnormalities of hip movement
5. Explain knee complex in terms of structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
6. Identify the normal and abnormal movements of knee joint
7. Discuss stability of knee complex
8. Describe the common abnormalities of knee movement
9. 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,
10. 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

Unit 6:

BK 6.1. Posture

1. Define Posture
2. Explain normal posture
3. Discuss the factors affecting posture
4. Explain the causes for abnormal posture
5. Discuss kinetics and kinematics of posture
6. Identify postural abnormalities
7. Discuss the role of posture in preventing musculoskeletal disorders.
8. Describe ergonomics
9. Discuss the effects of age, pregnancy, occupation and recreation on posture.

Unit 7:

BK 7.1. Gait

1. Explain the normal gait cycle
2. Discuss the kinetics and kinematics of gait
3. Discuss the determinants of gait
4. Identify gait abnormalities
5. Discuss the energy recruitment of normal and abnormal gait
6. Explain the kinetic and kinematic analysis of stair climbing
7. Identify the effects of muscle weakness on gait

PRACTICAL: B.P.T. BK 207 (P)

BK 8.1. Describe Movement Analysis: ADL activities like sitting – to standing, lifting, various grips, pinches

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 For BK

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 For BK

1. Steindler A. Kinesiology of the human body under normal and pathological conditions. Springfield, IL. Charles C Thomas.Neumann DA. Kinesiology of the musculoskeletal system-e-book: foundations for rehabilitation. Elsevier Health Sciences;
2. Oatis CA. Kinesiology: the mechanics and pathomechanics of human movement. Lippincott Williams & Wilkins;2009.
3. Hamill J, Knutzen KM. Biomechanical basis of human movement. Lippincott Williams & Wilkins; 2006 Oct1.
4. 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.
5. Margareta Nordin: Basic Biomechanics of Musculoskeletal System, 4thEdition

COURSE CODE: 208

Course Title: Yoga & Systems of Medicine: (AYUS) Theory (L) Practical (P)

AYUS 1.0. 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

AYUS 1.0.1. Course Outcomes: **Yoga & Systems of Medicine**

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 asanas and pranayama
4. have an understanding of kriyas

Course Contents: B.P.T. AYUS 208 (L)

Section A: Yoga

Unit 1: Foundations of Yoga

AYUS 1.1. Introduction to Yoga and its philosophy

AYUS 1.2. Brief history, development of Yoga

AYUS 1.3. Streams & types of Yoga

Unit 2: Yoga and Health

AYUS 2.1. Concept of body in yoga – Pancha kosha theory

AYUS 2.2. Concept of Health and Disease in yoga

AYUS 2.3. Stress management through yoga

AYUS 2.4. Disease prevention and promotion of positive health through yoga

Unit 3: Physiological effects of Yoga practices

AYUS 3.1. Physiological effects of Shat kriyas

AYUS 3.2. Physiological effects of Asanas

AYUS 3.3. Physiological effects of Pranayamas

AYUS 3.4. Physiological effects of Relaxation techniques and Meditation

Section B: Other Systems of Medicine

Unit 4: Other Systems of Medicine and Need for integration of various system of medicine

AYUS 4.1. Introduction to AYUSH system of medicine

AYUS 4.2. Introduction to Ayurveda.[Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.3. Naturopathy [Philosophy and Principals, Methods and Brief Treatment Techniques]

AYUS 4.4. Unani [Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.5. Siddha [Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.6. Homeopathy [Philosophy and Principals, Methods and Brief Treatment Techniques].

PRACTICAL: B.P.T. AYUS 208 (P)

List of Practical / Demonstrations (30 hours)

AYUS (P) 5.1. Sukshma Vyayama/Sithilikarna Vyayama and Surya Namaskar: (3 hours)

Loosening exercises of each part of the body particularly of the joints

12 step Surya namaskar

AYUS (P) 5.2. Yogic kriyas [Observation/ demonstration only] (3 hours)

1. Neti (Jala Neti, Sutra Neti)
2. Dhauti (Vamana Dhauti, Vastra Dhauti)
3. Trataka
4. Shankaprakshalana (Laghu & Deergha)

AYUS (P) 5.3. **Yogasanas:**

1. **Standing postures** (4 hours)
    i. Tadasana (Upward stretch posture)
    ii. Ardha Chakrasana (Half wheel posture)
    iii. Ardha Katichakrasana (Half lumber wheel posture)
    iv. Utkatasana (Chair posture)
    v. Pada Hastasana (Hand to toes posture)
    vi. Trikonasana (Triangle posture)
    vii. Parshva Konasana (Side angle posture)
    viii. Garudasana (Eagle posture)
    ix. Vrikshasana (Tree posture)

2. **Prone positions (4 hours)**
    i. Makarasana (Crocodile posture)
    ii. Bhujangasana (Cobra posture)
    iii. Salabhasana (Locust posture)
    iv. Dhanurasana (Bow posture)
    v. Naukasana (Boat posture)
    vi. Marjalasana (Cat posture)
3. **Supine postures (4 hours)**
    i. Ardha halasana/ Uttana Padasana
    ii. Sarvangasana (All limb posture)
    iii. Pawana muktasana (Wind releasing posture)
    iv. Matsyasana (Fish posture)
    v. Halasana (plough posture)
    vi. Chakrasana (Wheel posture)
    vii. Setu Bandhasana (Bridge posture)
    viii. Shavasana (Corpse posture)
4. **Sitting postures**
    i. Parvatasana (Mountain posture)
    ii. Bhadrasana (Gracious posture)
    iii. Vajrasana (Adamantine posture)
    iv. Paschimottanasana (Back stretching posture)
    v. Janushirasana (Head to knee posture)
    vi. Simhasana (Lion posture)
    vii. Gomukhasana (Cow head posture)
    viii. Ushtrasana (Camel posture)
    ix. Ardha Matsyendrasana (Half matsyendra spine twist posture)
    x. Vakrasana (Spinal twist posture)
    xi. Kurmasana (Turtle posture)
    xii. Shashankasana (Rabbit posture)
    xiii. Mandukasana (Frog Posture)

5. **Meditative postures and Meditation techniques (2 hours)**
    i. Siddhasana (Accomplished pose)
    ii. Padmasana (Lotus posture)
    iii. Samasana
6. **Swastikasana (Auspicious posture)**

AYUS (P) 5.4. **Pranayamas:**

1. The practice of correct breathing and Yogic deep breathing
2. Kapalabhati
3. Bhastrika
4. Sitali
5. Sitkari
6. Sadanta
7. Ujjayi
8. Surya Bhedana
9. Chandra Bhedana
10. Anuloma-Viloma/Nadishodana
11. Bhramari

AYUS (P) 5.5. **Relaxation Techniques**

1. Shavasana
2. Yoga Nidra

Recommended text books for AYUS

1. Lights on yoga by BKS Iyenngar
2. Lights on pranayam by BKS Iyenngar
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 Kuvalayanand, Kaivalaya dhama, Lonavala.
8. Yogic therapy : Swami Shivananda, Umachal Yoga Ashram, Kamakhya, Assam.

Course Code: B.P.T. 209: Clinical observation (COb)

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.

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THIRD YEAR B.P.T

Course Code :301

Course Title : General Medicine and Pediatrics: (GMP) Theory (L)

GMP 1.0. **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

GMP 1.0.1. **Course Outcomes**: **General Medicine and Pediatrics:**

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

8. Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of
    i. Communicable and infectious diseases
    ii. Cardio-vascular system (Acquired, congenital and infective)
    iii. Nervous system (Acquired, congenital, infective and traumatic)
    iv. Respiratory system (Infective, acquired, acute and chronic)

v. Gastro-intestinal system

vi. Genito- Urinary system

vii. Integumentary system

9. Demonstrate competencies in identifying common clinical signs of various disorders
10. Demonstrate knowledge in common diagnostic procedures used (Blood investigations, Radiologic procedures)
11. Appreciate the role of different specialist in diagnosing and managing the disorders.

GMP 1.0.2. **Teaching learning Methods**:

i. Lecture

ii. Tutorial

iii. Case discussion

iv. Clinical Observation

GMP 1.0.3. Assessment Methods:

i. MCQs

ii. Structured Essays

iii. Viva-voce

Course Contents: B.P.T. GMP 301 (L)

SECTION -A

Unit 1: Infections

GMP 1.1. Classify communicable diseases

GMP 1.2. Discuss the importance of prevention of communicable diseases

GMP 1.3. Discuss the physiological changes caused due to infection.

GMP 1.4. Describe the methods of spreading the infections

GMP 1.5. Discuss different types vaccination used in Infections

GMP 1.6. Discuss the importance of vaccination

GMP 1.7. Discuss the clinical features, Diagnosis, Complications and medical management of

1. Food poisoning and gastroenteritis
2. Sexually transmitted diseases
3. Tuberculosis Leprosy
4. Rheumatic fever

5. Tetanus, Typhoid, Diphtheria
6. Pneumonia
7. Influenza Herpes – simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, HIV infections and AIDS.

Unit 2:

GMP 2.1. **Metabolic and Deficiency Diseases:** Discuss etiology, clinical features, diagnosis, complications and treatment

1. Diabetes
2. Anemia
3. Vitamin &Mineral Deficiency diseases
4. diseases of the endocrine glands

Unit 3:

GMP 3.1. **Diseases of Respiratory System:** Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions:

1. Asthma
2. Bronchitis
3. Tuberculosis
4. Massive collapse of lungs
5. Bronchiectasis
6. Bronchial Pneumonia
7. lung abscess
8. Emphysema
9. Pleural effusion
10. Pneumothorax & vocal cords
11. chronic infection of larynx and trachea
12. Abnormalities of trachea
13. infract of lungs
14. chronic obstructive pulmonary disease
15. chest wall deformities

Unit 4:

GMP 4.1. **Diseases of Circulatory System:** Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions

1. Atherosclerosis, Thrombosis, Embolism, Hemorrhage, various diseases of arteries,
2. Vascular diseases
3. ischemic heart disease
4. rheumatic heart disease
5. congenital heart disease
6. cardiac arrest
7. Hypertension

SECTION -B

Unit 5: Nutritional Disorders

GMP 5.1. Describe in details about Nutritional and Energy requirements

GMP 5.2. Explain detail clinical Features and treatment of Deficiency diseases (Protein, Vitamin)

GMP 5.3. Discuss Management of Obesity – diet, exercise and medications

Unit 6:

GMP 6.1. **Diseases of Digestive and renal Systems:** Discuss etiology, clinical features, diagnosis, complications and treatment of the following:

1. 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
2. Viral Hepatitis, Wilson's disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholecystitis.
3. Renal Failure, Nephrotic Syndrome, Nephritis, Urinary tract infections, Urinary calculi.

Unit 7:

GMP 7.1. **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

GMP 8.1. Enumerate the problems and management LOW Birth Weight Babies

GMP 8.2. Describe the common congenital Abnormalities with causes and its management.

GMP 8.3. Explain the causes, types, complications, clinical manifestations, and medical management of cerebral palsy

GMP 8.4. Explain the causes, types, complications, clinical manifestations, and medical management of spinal malformations

GMP 8.5. Describe the causes, types, complications, clinical manifestations, and medical management of epilepsies

GMP 8.6. Discuss the causes, clinical manifestations, investigation procedures and medical management of autism spectrum disorders.

GMP 8.7. Discuss the causes, clinical manifestations, investigation procedures and management of hydrocephalus (Including surgical)

Unit 9: Geriatrics

GMP 9.1. Discuss the epidemiology, pathogenesis, clinical evolution, presentation and course of common diseases in the elderly

GMP 9.2. Discuss the causes, signs and symptoms degenerative disorders of the aging population (Neurological and musculoskeletal)

Recommended text books for GMP

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 for GMP

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, Papadakins, Tierncy: 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

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Course Code: 302

Course Title: General Surgery: (GS) Theory (L)

GS 1.0. 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

GS 1.0.1. **Course Outcomes**: 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)

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

GS 1.0.2. Teaching Learning Methods:

i. Lecture
ii. Tutorial
iii. Case discussion

GS 1.0.3. Assessment Methods:

i. MCQs
ii. Essay
iii. Viva-voce

SECTION -A

Unit 1: Introduction to General Surgery

GS 1.1. Discuss the principles of surgeries

GS 1.2. Explain the process of wound healing

GS 1.3. Discuss the surgical management of non-healing wounds

GS 1.4. Explain the principles of incision and suturing

GS 1.5. Discuss the types of anesthesia

GS 1.6. Explain the complications of general anesthesia on various systems

GS 1.7. Discuss the Principles of Post-operative management

Unit 2: Abdominal surgeries

GS 2.1. Explain the common abdominal incisions

GS 2.2. Discuss the common abdominal and pelvic organ surgical procedures and its Physiotherapy implications (Herniorrhaphy, Colostomy, Ileostomy, Hysterectomy, Prostatectomy, cystectomy, Appendectomy and Cholecystectomy)

SECTION –B

Unit 3: Thoracic surgeries

GS 3.1. Explain the common thoracic incisions

GS 3.2. 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

GS 4.1. Explain the types of burns

GS 4.2. Explain the assessment procedures followed in standard burn care unit

GS 4.3. Discuss the medical and surgical management of Burns

GS 4.4. Discuss the common procedures used in plastic surgery and skin grafting

GS 4.5. Discuss the role of Physiotherapy following skin grafts

Unit 5: Soft tissue surgeries

GS 5.1. Discuss the principles of tendon transfer surgeries

GS 5.2. Discuss the common tendon transfer surgery procedures in terms of indications, prognosis, postoperative care and Physiotherapy role.

Unit 6: Obstetrics and Gynaecology

COURSE OUTCOMES: At the end of the course, the student will be able to 1. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post-natal stage and menopause 2. Discuss various complications during pregnancy, labor, puerperium and postnatal stage, pre-andpost-menopausal stage and various aspects of urogenital dysfunction and the management in brief 3. Acquire knowledge in brief about intra uterine development of the fetus 4. Acquire the skill of clinical examination of the pelvic floor 5. Acquire the skill of the clinical examination of pregnant woman.

OBG 6.1. Anatomy and physiology of the female reproductive organs. Puberty dynamics.

OBG 6.2. Physiology of menstrual cycle-ovulation cycle, uterine cycle Cx. cycle, Duration. Hormonal regulation of menstruation.

OBG 6.3. Diagnosis of pregnancy.

OBG 6.4. Abortion

OBG 6.5. Physiological changes during pregnancy.

OBG 6.6. Antenatal care.

OBG 6.7. High risk pregnancy., prenatal, common complications Investigation and management

OBG 6.8. Muscuskeletal disorders during pregnancy

OBG 6.9. Normal labour. Multiple Child birth

OBG 6.10. Child birth complications, investigations and management

OBG 6.11. Normal puerperium, lactation and postnatal.

OBG 6.12. Family planning. Medical Termination of pregnancy (MTP).

OBG 6.13. Infection of female genital tract including sexually transmitted diseases, low backache.

OBG 6.14. Prolapse of uterus and vagina.

OBG 6.15. Principles of common gynaecological operations Hysterectomy, D&C, D&E, PEP Smear

OBG 6.16. Menopause and its effects

OBG 6.17. Sterility- Pathophysiology, investigations, management

OBG 6.18. Urogenital dysfunction – pre and post natal condition

OBG 6.19. Carcinoma of female reproductive organs – surgical management in brief

Recommended text Books for GS

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

6. Text book of Gynecology – by Dutta – New Central Book Agency

7. Dewhurst's Textbook of Obstrutics & Gynaecology

8. "Gabbie's Obstrtrics " and "Clinical Obstrtics and Gynaecology "

Recommended reference books for GS

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: (OR) Theory (L)

OR 1.0. 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.

OR 1.0.1. **Course Outcomes**: **Orthopedics**

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

Course Contents: Orthopedics: (OR) 303 (L)

SECTION -A

Unit 1

OR 1.1. Introduction

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

OR 1.2. Traumatology

1. Fracture: definition, types, signs and symptoms.
2. Fracture healing.
3. Complications of fractures.
4. Conservative and surgical approaches.
5. Principles of management – reduction (open/closed, immobilization etc.).
6. Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).

OR 1.3. Fractures and Dislocations of Upper Limb

1. Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
2. Fractures of clavicle and scapula.
3. Fractures of greater tuberosity and neck of humerus.
4. Fracture shaft of humerus.
5. Supracondylar fracture of humerus.
6. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.
7. Side swipe injury of elbow.
8. Both bone fractures of ulna and radius.
9. Fracture of forearm – monteggia, galaezzi fracture –dislocation.
10. Chauffer's fracture.
11. Colle's fracture.
12. Smith's fracture.
13. Scaphoid fracture.
14. Fracture of the metacarpals.
15. Bennett's fracture.
16. Fracture of the phalanges. (Proximal and middle.)

OR 1.4. Dislocations of Upper Limb –

1. Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, Bankart's) etc.
2. Recurrent dislocation of shoulder.
3. Posterior dislocation of shoulder – mechanism of injury, clinical features and management.
4. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.
5. Hand Injuries - mechanism of injury, clinical features, and management of the following –
6. Crush injuries.
7. Flexor and extensor injuries.
8. Burn injuries of hand

UNIT 2

OR 2.1. Fracture of Spine

1. 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).
2. Clay shoveller's fracture.
3. Hangman's fracture.
4. Fracture odontoid.
5. Fracture of atlas.

OR 2.2. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management— conservative and surgical of common fractures around thoracic and lumbar regions

OR 2.3. Fracture of coccyx.

OR 2.4. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.

OR 2.5. Fractures and Dislocations of Lower Limb

1. Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative a surgical management of the following fractures:
2. Fracture of pelvis.
3. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
4. Fractures of trochanters.
5. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.
6. Supracondylar fracture of femur.
7. Fractures of the condyles of femur.
8. Fracture patella.
9. Fractures of tibial condyles.
10. Both bones fracture of tibia and fibula.
11. Dupuytren's fracture
12. Maisonneuve's fracture.
13. Pott's fracture – mechanism of injury, management.
14. Bimalleolar fracture
15. Trimalleolar fracture
16. Fracture calcaneum – mechanism of injury, complications and management.
17. Fracture of talus.
18. Fracture of metatarsals—stress fractures Jone's fracture.
19. Fracture of phalanges.

OR 2.6. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.

1. Anterior dislocation of hip.
2. Posterior dislocation of hip.
3. Central dislocation of hip.
4. Dislocation of patella.
5. Recurrent dislocation of patella.

OR 2.7. Soft Tissue Injuries - Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis.

OR 2.8. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:

1. Meniscal injuries of knee.
2. Cruciate injuries of knee.
3. Medial and lateral collateral injuries of knee.
4. Lateral ligament of ankle.
5. Wrist sprains.
6. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
7. Contusions- quadriceps, gluteal, calf, deltoid etc.
8. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

SECTION -B

UNIT 3

OR 3.1. Amputations - Definition, levels of amputation of both lower and upper limbs, indications, complications.

OR 3.2. Traumatic Spinal Cord Injuries - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.

OR 3.3. Deformities - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

1. Congenital Deformities –
    i. CTEV.
    ii. CDH.
    iii. Torticollis.
    iv. Scoliosis.
    v. Flat foot.
    vi. Vertical talus.
    vii. Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita (amyoplasia congenita).
    viii. Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfecta(fragile ossium).
    ix. Cervical rib.

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

OR 3.4. Disease of Bones and Joints: Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:

1. Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.
2. Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilitic infection of joints.
3. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosar- coma, Osteochondroma. Enchondroma. Ewing's sarcoma. Gaint cell tumor. Multiple myeloma. Metastatic tumors.
4. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.
5. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.
6. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
7. Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints.
8. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

UNIT 4

OR 4.1. Syndromes: Causes, Clinical features, complications, management- conservative and surgical of the following:

1. Cervico brachial syndrome.
2. Thoracic outlet syndrome. Vertebro- basilar syndrome.
3. Scalene syndrome.
4. Costo clavicular syndrome.
5. Levator scapulae syndrome.
6. Piriformis syndrome.

OR 4.2. Neuromuscular Disorders: Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:

1. Cerebral palsy.
2. Poliomyelitis.
3. Spinal Dysraphism.
4. Leprosy.

OR 4.3. Cervical and Lumbar Pathology: Causes, clinical feature, patho-physiology, investigations, management-Medical and surgical for the following:

1. Prolapsed intervertebral disc (PID),
2. Spinal Canal Stenosis
3. Spondylosis (cervical and lumbar)
4. Spondylolysis.
5. Spondylolisthesis.
6. Lumbago/ Lumbosacral strain.
7. Sacralisation.
8. Lumbarisation.
9. Coccydynia.
10. Hemivertebra.

OR 4.4. Orthopedic Surgeries: Indications, Classification, Types, Principles of management of the following Surgeries:

1. Arthrodesis.
2. Arthroplasty (partial and total replacement).
3. Osteotomy,
4. External fixators.
5. Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc ,
6. Limb re-attachments.

OR 4.5. Regional Conditions: Definition, Clinical features and management of the following regional conditions

1. Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.
2. Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis.
3. Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
4. Pelvis and Hip: IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.
5. Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
6. 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 for OR

1. Outline of Fracture-Adams
2. Outline of Orthopaedics-Adams
3. Orthopaedics and Traumatology-Natrajan
4. Apley's Orthopaedics
5. Textbook of orthopaedics- Maheshwari

Recommended Reference Books for OR

1. Tureks Orthopaedics.
2. Cambells Operative Orthopaedics.

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
राष्ट्रीय सहबद्ध और स्वास्थ्य देखभाल पेशे आयोग
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COURSE CODE: B.P.T -304

Course Title: Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions: (PTMS) Theory (L) Practical (P)

PTMS 1.0. 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

PTMS 1.0.1. Course Outcomes: **Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions**

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 psrocedures 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

Course Contents: B.P.T. PTMS Theory (L)

SECTION -A

Unit 1

PTMS 1.1. Oedema-Traumatic, Obstructive, Paralytic, oedema due to poor muscle and laxity of fascia Lymphedema

PTMS 1.2. 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.

PTMS 1.3. 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 Hyperhydrosis. Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot;

Unit 2

PTMS 2.1. Principles of Pre and post operative Physiotherapy in abdominal surgeries common Complication, Abdominal incisions assessment,

PTMS 2.2. Physiotherapy in pre and post-operative stages of Operations on upper G.I.T.- oesophagus, stomach, duodenum, Operations on large and small intestine – Appendicectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, herniorrhaphy, hernioplasty.

PTMS 2.3. Physiotherapy in burns, skin grafts, and reconstructive surgeries

SECTION -B

Unit 3

PTMS 3.1. 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 Cana Treatment theory, goals of management and progression Exercise Prescription in Vertigo

PTMS 3.2. **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 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

PTMS 3.3. 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

PTMS 4.1. **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

PTMS 4.2. Physiotherapy in metabolic disorders: Role of Physiotherapy in Hypertension Role of Physiotherapy in Diabetes

PTMS 4.3. Ear, Nose and Throat conditions: Otitis Media, Sinusitis mastoidectomy, chronic rhinitis, laryngectomy, pharyngeolaryngectomy, facial palsy. Physiotherapy in dentistry – TMJ rehabilitation

Unit 5

PTMS 5.1. Abdominal Surgeries

PTMS 5.2. Cleft lip and Cleft Palate

PTMS 5.3. Health Fitness and Promotion: Fitness Evaluation, Analysis of Body composition, Evaluation and prescription of Exercise, Factors affecting exercise Performance, Exercise Prescription for Children.

PTMS 5.4. CBR in paediatrics

PTMS 5.5. Evidence based practice (desirable to know)

PRACTICAL/ clinical –B.P.T. Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions: 304 Practical : PTMS (P)

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

PTMS (P) 6.1. Bedside case presentations and case discussions

PTMS (P) 6.2. Lab sessions consisting of evaluation and assessment methods and treatment techniques on student models/ simulation.

PTMS (P) 6.3. Identification of impairment activity limitation and participation restriction and Planning and execution of management protocol for various medical and surgical conditions with respect to

1. Active exercise regimen
2. RESPIRATORY techniques
3. Passive mobilization and stretching procedures
4. Selection of electrotherapeutic modalities

5. Patient and caregiver education and training
6. Functional training programme
7. Bladder bowel training
8. Integumentary care

PTMS (P) 6.4. Prescription and training of suitable aids appliances and Orthotic devices

PTMS (P) 6.5. Ergonomic advice

Recommended text books for PTMS

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 for PTMS

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

CURSE CODE: B.P.T-305

Course Title: Physiotherapy in Adult and Paediatric Orthopedic Conditions: (PTO) Theory (L) Practical (P)

PTO 1.0. 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 contraindication, 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.

PTO 1.0.1. **Course Outcomes**: **Physiotherapy in Adult and Paediatric Orthopedic Conditions**

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 Healthcare providers.

Course Contents: Physiotherapy in Adult and Paediatric Orthopedic Conditions: (PTO) 305 Theory (L)

SECTION -A

Unit 1

PTO 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.

PTO 1.2. 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.

PTO 1.3. Principles of various schools of thought in manual therapy. (Briefly Maitland and Mc kenzie

PTO 1.4. 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, Synovectomy.

PTO 1.5. 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.

PTO 1.6. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. De- scribe 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

PTO 2.1. 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:

PTO 2.2. 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

PTO 2.3. 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

PTO 2.4. 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

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Section-B

Unit 3

Conservative and/peri-operative PT management. in

PTO 3.1. Traumatic conditions of lower limb: pelvis, hip knee ankle and foot fractures and dislocations

PTO 3.2. Non-Traumatic 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, CDH, pes planus, pes cavus, coxa vara, genu varum, valgum and recurvatum

PTO 3.3. 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 Ligamentous tears

PTO 3.4. Amputations of lower 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

Unit 4

Conservative and/peri-operative PT management in

PTO 4.1. Traumatic conditions of spine: SPINAL FRACTURES cervical thoracic lumber Spinal CORD INJURY Intervertebral disc prolapsed (PIVD) sprain contusion

PTO 4.2. Non traumatic condition of spine: Cervical and lumbar spinal disorders: spondylosis, spondylolisthesis, Stenosis Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacroiliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta, Thoracic Outlet Syndrome TB SPINE, non-specific low back pain Ankylosis spondylitis Scoliosis, kyphosis, Lordosis, sway back, torticollis

PTO 4.3. Pre and peri operative PT management following spine surgeries

PTO 4.4. Concepts of mechanize school of spinal disorders, back school

Unit 5

PTO 5.1. Deformities – Review the Causes, Clinical Features, Complications, radiological features, Medical and Surgical Management of the Following Congenital and Acquired

1. Deformities: Congenital deformities - CTEV. CDH. Torticollis. Scoliosis. Flat foot. Vertical talus. Hand anomalies - syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenital (amyoplasia congenita). Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfect (fragile ossium).

2. Acquired deformities - Acquired Torticollis. Scoliosis. Kyphosis. Lordosis. Genu varum. Genu valgum. Genu recurvatum Coxa vara. Pes cavus.

PTO 5.2. Diseases of Bones and Joints – Introduction, Causes, Clinical features, Types, Complications, Investigations and Management - medical and surgical of the following conditions: 1. Infective: Osteomyelitis, TB Spine and other major joints 2. Perthes, Slipped Capital Femoral Epiphysis, Avascular Necrosis 3. Metabolic: Rickets, Osteomalacia

PTO 5.3. Soft tissue injuries in Paediatrics - Overview, Investigations and Management

PTO 5.4. Fractures and dislocations of Upper extremity, Lower extremity and Spine in Paediatrics - Introduction, Investigations and Orthopedic management

PTO 5.5. Low back pain and neck pain in Paediatrics - Introduction, Causes, Types, Investigations and Management

PTO 5.6. Paediatric sports injuries - Introduction, Types, Investigations and Management

PTO 5.7. Amputations, Illizarov

PTO 5.8. Surgeries for cerebral palsy (Rhizotomy, Tendon lengthening, osteotomies, arthrodesis)

PRACTICAL – B.P.T Physiotherapy in Adult and Paediatric Orthopedic Conditions: 305 PTO Practical

PTO (P) 6. 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.

3. 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

4. Planning and execution of management protocol for various conditions of upper limb, lower limb, and spine in various clinical settings with respect to adult and Paediatric conditions
5. Active exercise regimen
6. Passive mobilization procedures Selection of electrotherapeutic modalities
7. Patient education
8. Functional training programme
9. Orthotic and prosthetic checkout and training Ergonomic advice

Recommended Text Books for PTO

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 for PTO

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: (PFDP) Theory (L) Practical (P)

PFDP 1.0. 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 .

PFDP 1.0.1. 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

Course Contents: B.P.T. Physical & Functional Diagnosis and Prescription: 306 (PFDP) Theory (L)

SECTION -A

Unit 1

PFDP 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

PFDP 1.2. **Assessment of pain T**ypes 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)

PFDP 1.3. 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

PFDP 1.4. Neurological Assessment and Movement Dysfunction, 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

PFDP 1.5. 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

PFDP 1.6. 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

PFDP 2.1. General principles of Human development& maturation

1. Aspects a) Physical b) motor c) Sensory d) Cognitive & Perceptive e) Emotional f) Social
2. Factors influencing human development & growth: a) Biological b) Environmental inherited
3. Principles of maturation in general & anatomical directional pattern – a) Cephelo – caudal b) Proximo – distal c) Centero – lateral d) Mass to specific pattern e) Gross to fine motor development f) Reflex maturation tests
4. Development in specific fields - Oromotor development, sensory development, neurodevelopment of hand function

PFDP 2.2. **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

PFDP 2.3. 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

PFDP 2.4. 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 B.P.T. Physical & Functional Diagnosis and Prescription 306 Practical : PFDP (P)

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 for PFDP

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 10thEdition
9. Pulmonary Function Tests & Interpretation In Health & Diseases By P.S.Shankar3rd Edition
10. World Health Organization 2001. The International Classification of Functioning, Disability and Health (ICF). Geneva: WHO.http://www.who.int/clas- sifications/icf/en/

Recommended Reference Books for PFDP

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: : (RMB) Theory (L)

RMB 1.0. 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.

RMB 1.0.1. **Course Outcomes**: 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.
10. 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
11. 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
12. Discuss meaning, need, features & basic principles of Research design.
13. 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 de- sign

14. 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.
15. Enumerate the Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules
16. Discuss the Processing & analysis of data: coding of data, types of data, quantitative analysis qualitative analysis
17. Describe Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis)
18. Explain the Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

RMB 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration
4. Small group discussion

RMB 1.0.3. Assessment Methods:

1. MCQs
2. Assignment
3. Seminar
4. Presentations

Course Content: B.P.T **RMB 307 Theory (L)**

SECTION -A

Unit 1: Introduction to Biostatistics

RMB 1.1. 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.

RMB 1.2. 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

RMB 1.3. 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.

RMB 1.4. Discuss the Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skew ness, kurtosis.

RMB 1.5. 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

RMB 1.6. 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

RMB 1.7. Describe Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)

RMB 1.8. 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

RMB 1.9. Discuss the process of systematic review, Discuss metanalysis, Appraise the evidence using appropriate critical appraisal tools (RCT, Systematic Reviews, Cohort studies).

RMB 1.10. Discuss the importance of Outcome measures, Identify appropriate outcome measures, Discuss sensitivity, Specificity and Minimal Clinical Significance difference

RMB 1.11. 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

UNIT 2

RMB 2.1. 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

RMB 2.2. 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

RMB 2.3. Research design: Meaning of research design, need for research design, Features for good design, Different research designs, Basic principles of research design

RMB 2.4. 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

RMB 2.5. 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.

RMB 2.6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.

RMB 2.7. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).

RMB 2.8. Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

UNIT 3

RMB 3.1. 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.

RMB 3.2. 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

RMB 3.3. 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.

RMB 3.4. Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skew ness, kurtosis.

RMB 3.5. 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

RMB 3.6. 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

RMB 3.7. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA).

UNIT 4

RMB 4.1. **Introduction to Evidence Based practice** Definition, background, importance, model of Evidence Based Physiotherapy, role of evidence-based practitioner

RMB 4.2. 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

RMB 4.3. **Exploring different terminologies** Validity, reliability, Randomized Control Trial, Systemic Review, Meta-Analysis, Case Study, Diagnostic research study, Prognostic Research study, Intervention research study,

RMB 4.4. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system

RMB 4.5. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs

UNIT 5

RMB 5.1. Appraisal of the quality of the studies, result of the studies, technique of pull out the summary of the studies and communicate evidence about di- agnostic test Diagnostic test and process in Physiotherapy,

RMB 5.2. evidence about prognosis Concept of prognosis, research design relevant to prognostic studies, process of knowing the quality of study

RMB 5.3. evidence about outcome measure Elements of outcome measure, method of knowing validity and reliability, take out the outline from the studies

RMB 5.4. 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

RMB 5.5. 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

RMB 5.6. Practice guidelines, algorithms, and clinical pathways: Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical path- ways, Legal implications in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways

Recommended Text Book for RMB

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 for RMB

1. Evidence Based Physical Therapy by Linda Fetters, 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

Course Code: B.P.T 308: Clinical Education (CEd)

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 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.

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4TH YEAR B.P.T

COURSE CODE: B.P.T -401

Course Title: Neurology Including Psychiatry and Neurosurgery: (NPNS) Theory (L)

NPNS 1.0. **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 psychiartic conditions and appreciate the role of Physiotherapy in overall management of patient.

NPNS 1.0.1. **Course Outcomes: Neurology Including Psychiatry and Neurosurgery**

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.

Course Contents: B.P.T Neurology Including Psychiatry and Neurosurgery 401 NPNS Theory (L)

SECTION -A

Unit 1

NPNS 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.

NPNS 1.2. Reviews in brief the neurophysiologic basis of tone and Disorders of tone and Posture, Bladder control, Muscle conduction, Movement and Pain, Management of Pain, Electrical Stimulation of Brain and Spinal cord.

NPNS 1.3. Trauma - Broad localization, first aid and management.

NPNS 1.4. 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.

1. Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.
2. Assessment of higher mental function such as Orientation, Memory, Attention, Speech and Language.
3. Assessment of Cranial nerves.
4. Assessment of Motor system.
5. Assessment of Sensory function, Touch, Pain and Position.
6. Assessment of Tone-Spasticity, Rigidity and Hypotonia.
7. Assessment of Cerebral function.
8. Assessment of Higher cortical function - Apraxia.
9. Assessment of Gait Abnormalities.

NPNS 1.5. 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.

NPNS 1.6. Deafness, vertigo, and imbalance: Physiology, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.

NPNS 1.7. 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.

NPNS 1.8. 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, Brain injury, Compression by Space occupying lesion, infections of brain, etc.

NPNS 1.9. 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

NPNS 1.10. 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, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy.

Unit 2

NPNS 2.1. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.

NPNS 2.2. 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.

NPNS 2.3. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications

NPNS 2.4. 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.

NPNS 2.5. 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, Seizers, 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. Alzheimer disease

Unit 3

NPNS 3.1. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.

NPNS 3.2. Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic 326ounseling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.

NPNS 3.3. 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.

NPNS 3.4. 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, Pudendal nerve palsy.

NPNS 3.5. 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, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.

NPNS 3.6. 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, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.

NPNS 3.7. Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.

NPNS 3.8. 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

NPNS 4.1. 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.

NPNS 4.2. Etio-pathogenesis, manifestations, and management of psychiatric illness

NPNS 4.3. Drug dependence and alcoholism, Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue, Personality disorders

NPNS 4.4. Child psychiatry - manifestations, and management of childhood disorders - **Intellectual Disability** 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 for NPNS

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

Recommended Reference Books for NPNS

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.
3. Neurological Rehabilitation - Darcy Umphred.

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COURSE CODE: B.P.T-402

Course Title: Physiotherapy in Adult and Paediatric Neurological and Neurosurgical Conditions: (PTN) Theory (L) Practical (P)

PTN 1.0. 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.

PTN 1.0.1. **Course Outcomes**: **Physiotherapy in Adult and Paediatric Neurological and Neurosurgical Conditions**

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.

Course Contents: B.P.T PTN 402 (L)

SECTION-A

UNIT 1

PTN 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, Brudenzki sign, Tinels'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.

PTN 1.2. 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

PTN 2.1. 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

PTN 2.2. 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 Syn- drome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.

UNIT 3

PTN 3.1. 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

PTN 3.2. 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

PTN 4.1. 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 Pudendal nerve palsy.

PTN 4.2. 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 dis- ease, Chorea, Hemiballismus, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.

PTN 4.3. Applied Yoga in Neurological conditions.

UNIT 5

PTN 5.1. Problems and management of LBW infants, Perinatal problems and management, Respiratory conditions of childhood, Epilepsies – types, diagnosis and treatment; Sensory disorders – problems resulting from loss of vision and hearing; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, educational delay, The Clumsy Child.

PTN 5.2. Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical management

PTN 5.3. Developmental assessment scales (Motor, sensory, cognitive, neurological, functional scales used for neonates like Brazelton, TIMP, MAI, NBA, AIMS etc.). Overview of speech, cognition and social development

PTN 5.4. PT assessment and management of Developmental delay and High-risk babies

PTN 5.5. Exercise testing protocols/ tests – Common protocols used in pediatric in Obesity and Juvenile Diabetes

PTN 5.6. Pre and post-surgical PT assessment and management of Traumatic brain injury, spinal cord disorders (Traumatic and nontraumatic spinal cord injuries, Spina Bifida), Brachial Plexus Injury, peripheral nerves (Chemical Neuritis of Upper and Lower extremities) and cranial nerves (Bell's Palsy), Hydrocephalus

PTN 5.7. Physiotherapy management for disorders of the muscles – Myopapathies – congenital and acquired. Muscular dystrophy (Duchenne's, Becker's, Spinal Muscle atrophy)

PTN 5.8. Paediatric neurology – Developmental disorders, Learning disabilities, Meningitis and encephalitis, Guillain Barre syndrome, Autism, Down's syndrome, ADHD, Poliomyelitis, Bell's palsy, congenital facial palsy

PTN 5.9. Physiotherapy management of Neuropsychiatric disorders, Cerebral & Craniovertebral anomalies & metabolic disorders of nervous system

PTN 5.10. Poliomyelitis - Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management.

PTN 5.11. Neural Tube defects

PTN 5.12. Introduction and Classification of Metabolic and Genetic disorders and Genetic Counselling – Down's Syndrome, West's syndrome, Wilson's syndrome, Leigh's disease, Angelman's syndrome

PRACTICAL: B.P.T PTN 402 (P)

PTN (P) 6. 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
3. History taking: examination observation palpation tests, investigation, diagnosis, functional diagnosis [impairment, functional restriction, activity limitation] documentation
4. Planning and execution of management protocol for commonly encountered neurological condition in clinical practice of Physiotherapy with respect to Active exercise regimen
5. Inhibitory and facilitator techniques
6. Passive mobilization and stretching procedures Selection of electrotherapeutic modalities
7. Patient and caregiver education and training Functional training programme
8. Bladder bowel training Integumentary care
9. Prescription and training of suitable aids appliances and Orthotic Devices Ergonomic advice

Recommended Text Books for PTN

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 for PTN

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. Patricia M D. Right in the middle. Springer-Verlag

COURSE CODE BPT 403

Course Title - CARDIO THORACIC DISEASES AND SURGERIES : (CTD) Theory (L)

Course Content: B.P.T CTD 403 (L)

SECTION -A

CTD 1.1 Brief idea of Anatomy and Physiology of Cardio- respiratory systems,

CTD 1.2 Outline Aetiopathogenesis of Cardio -Vascular System disorders, Investigations, Diagnostic, Differential diagnosis and principles of management.

1. Cardiac failure - Definition, Causes, Symptoms and Signs and Brief management of Cardiac failure.
2. Rheumatic Fever - Definition, Brief description of Aetiology, Clinical features, Complication and Treatment.
3. Congenital Heart Diseases: Classification and brief outline of diseases like ASD, VSD, PDA, Fallot's Tetralogy with complication.
4. Ischemic Heart Disease - Aetiopathogenesis, Classification. Symptoms, Diagnosis and Medical and Surgical treatment.
5. Hypertension - Definition, Classification, Symptomatology, Complications and Treatment,
6. Infective Endocarditic - Brief aetiopathogenesis, clinical features, Diagnosis and Treatment.
7. Brief description of Deep Vein Thrombosis and Pulmonary embolism.
8. Vascular Disease: Atherosclerosis, Burger's disease, Phlebitis etc.

CTD 1.3 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

CTD 1.4 Cardio thoracic surgery Theory

1. Introduction-types of incision, pre and post operative assessment, management and complications of cardio thoracic surgery and their management.
2. Describe in detail the following procedure: management of endotracheal tubes, tracheal Suction, Weaning the patient from ventilator, Extubation and Post-extubation care.
3. Describe the principles of cardio-pulmonary Resuscitation, cardiac Massage, Artificial respiration, defibrillators and their use.
4. Cardiac Surgery-Outline indication, contra indication, site of incision, pre and post Operative management and complications of the following:
    i. Valvotomy and Valve Replacement
    ii. Open heart surgery/ cardiac bypass surgery, Surgery of pericardium Heart transplantation
    iii. Pacemaker
    iv. Coronary angioplasty and Balloon angioplasty and
5. Vascular surgery (Outline surgery and artery and veins)
6. Thoracic Surgery
    i. Outline clinical features and management of the following; fracture of ribs, Flail chest, stove in chest, Pneumothorax, Haemothorax, Lung contusion and Laceration and injury to vessels and bronchus.
    ii. Outline indications, contradiction, site of incision, pre and post operative management and complication of following-Lobectomy, Pneumonectomy, segmentectomy, pleuro-pneumonectomy, Thoracoplasty, decortication, Tracheostomy.
    iii. Outline clinical features and management of carcinoma of lung.

Book References for CTD

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

स्वास्थ्यम् सर्वार्थसाधनम्
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राष्ट्रीय संबद्ध और स्वास्थ्य देखभाल पेशेवर आयोग

COURSE CODE: B.P.T 404

Course Title: Physiotherapy in Adult and Paediatric Cardiothoracic Conditions and Surgical Conditions: (PTCT) Theory (L) Practical (P)

PTCT 1.0. **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 contraindication, 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.

PTCT 1.0.1 **Course Outcomes**: **Physiotherapy in Adult and Paediatric Cardio-thoracic disease and Surgical Conditions**

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.
6. Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers.

PT in Cardio- Respiratory conditions

7. 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
8. Demonstrate competencies in developing and implementing evidence-based Physiotherapy protocol in managing
    1. Bed-side demonstration
    2. Respiratory diseases (Acute and chronic)
    3. Cardiac diseases (Acquired, Congenital and infective)
    4. Lung surgeries
    5. Open and closed heart surgeries
    6. Vascular surgeries
    7. Lung and cardiac transplantation
9. Demonstrate competencies in performing clinical exercise testing as part of clinical decision making. (SH)
10. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders (SH)
11. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format. (SH)
12. Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers. (SH)

PTCT 1.0.2 **Teaching Learning Methods:**

1. Lecture
2. Tutorial
3. Case discussion
4. Virtual reality-based training
5. Simulation

PTCT 1.0.3 **Asse**ssment Methods:

1. MCQs
2. OSCE, OSPE, OSLER
3. DOPS
4. Portfolio

Course Contents: B.P.T PTCT 404 Theory (L) and Practical (P)

SECTION-A

Unit 1: Basics of Respiratory System

PTCT 1.1. Discuss the process of gaseous exchange

PTCT 1.2. Explain the possible factors which affects gaseous exchange

PTCT 1.3. Discuss the effect of impaired gaseous exchange on function

Unit 2: Cardio Respiratory Evaluation assessment

PTCT 2.1. Demonstrate skills to interpret the common investigations to identify problems that can be managed by Physiotherapy

PTCT 2.2. Discuss the principles of cardio respiratory assessment pertaining to Physiotherapy clinical decision making

PTCT 2.3. Demonstrate skills in reading medical records to formulate Physiotherapy related hypothesis

PTCT 2.4. Demonstrate skills in conducting subjective assessment

PTCT 2.5. Demonstrate skills in performing physical examination to identify the problems

i. Palpation
ii. Chest expansion measurements
iii. Percussion note
iv. Tactile and vocal fremitus
v. Auscultation
vi. Six minute walk test
vii. Blood investigations
viii. ABG
ix. Chest X ray

x. PFT

xi. ECG

xii. Exercise testing report

PTCT 2.6. Demonstrate skills in selecting and applying appropriate outcome measures used cardio-respiratory care.

PTCT 2.7. Demonstrate skills in identifying impairments, activity limitations and participatory restrictions caused by cardio respiratory disorders with appropriate rationale

PTCT 2.8. Prioritise and formulate Physiotherapy goals

Unit 3: Physiotherapy techniques in cardiorespiratory dysfunction

PTCT 3.1. Physiotherapy techniques used for airway secretions

1. Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for airway secretions

   and

2. Demonstrate physiotherapy techniques used to clear airway secretions for

   i. Positioning

   ii. Postural Drainage

   iii. Chest wall manipulation

   iv. Forced Expiratory techniques

   v. Active Cycle of breathing techniques

   vi. Autogenic drainage

   vii. Positive Expiratory Pressure

   viii. IPPB

PTCT 3.2. Physiotherapy techniques used for improving lung volume

1. Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to Physiotherapy techniques used for improving lung volume and

2. Demonstrate Physiotherapy techniques used to improve lung volume for

   i. Deep Breathing Exercise

   ii. Thoracic expansion exercise

   iii. Sustained maximal Inspiration

   iv. IPPB

   v. CPAP

PTCT 3.3. Physiotherapy techniques used for reducing breathlessness

1. Explain the Physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for reducing breathlessness

   and

2. Demonstrate Physiotherapy techniques used to reduce breathlessness
   i. Relaxation positions
   ii. Breathing control techniques
   iii. Pacing techniques

PTCT 3.4. Adjuncts used in respiratory physiotherapy care

1. Explain the Physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to adjuncts used in respiratory physiotherapy care

   and

2. Demonstrate skills in selecting and administering
   i. Humidification therapy
   ii. Aerosol therapy
   iii. Oxygen therapy

PTCT 3.5. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with respiratory disorders (Acute exacerbations and chronic)

1. Asthma
2. COPD
3. Interstitial lung disease Bronchiectasis
4. Pneumonia
5. Pleural disorders

PTCT 3.6. Prioritise Physiotherapy related problems based on the assessment in providing respiratory care

PTCT 3.7. Plan Physiotherapy care with rationale for the identified problems in respiratory care

PTCT 3.8. Demonstrate skills in providing Physiotherapy care for the identified problems in clients with respiratory disorders

PTCT 3.9. Pulmonary Surgeries:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients undergone pulmonary surgeries and
2. Demonstrate skills in providing Physiotherapy care for the identified problems in clients undergone pulmonary surgeries for
    1. Lung volume reduction
    2. Lung transplantation
    3. Pleural surgeries

PTCT 3.10. Pulmonary Rehabilitation

1. Define Pulmonary Rehabilitation
2. Discuss the need for pulmonary rehabilitation
3. Explain the components of Pulmonary Rehabilitation
4. Demonstrate skills in performing Physiotherapy assessment in clients referred for pulmonary rehabilitation
    i. Subjective assessment
    ii. Physical examination
    iii. Exercise testing
    iv. Respiratory muscle testing
    5. Prescribe exercise based on the assessment for the clients in pulmonary rehabilitation programme

UNIT 4: Neonatal and Pediatric Cardiopulmonary Physiotherapy assessment and Care:

PTCT 4.1. Anatomical and Physiological differences between the Adult and Pediatric lung

PTCT 4.2. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders

PTCT 4.3. Postural Drainage for pediatric population and modifications at home

PTCT 4.4. Therapeutic tools, Equipment's, Aids and appliances in Pediatric Physiotherapy rehabilitation

PTCT 4.5. Intensive care unit and Physiotherapy – Equipments, instruments, Common Physiotherapy procedures in Neonatal and pediatric intensive care

PTCT 4.6. Cardio-Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumonectomy, Lobectomy segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. An overview of cardiac surgeries in paediatrics

PTCT 4.7. Disorders of the Cardiovascular System – Definition, Clinical features, diagnosis and choice of management for the following disorders: Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease: Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels

PTCT 4.8. Physiotherapy assessment and management in Pediatrics Cardiac conditions

PTCT 4.9. Physiotherapy assessment and management in Respiratory conditions in Pediatrics - Childhood asthma, Respiratory distress syndrome, Hyaline membrane disease/Bronchopulmonary dysplasia, Meconium aspiration syndrome, Pneumonia, Cystic fibrosis, Bronchiectasis, Congenital diaphragmatic hernia

SECTION -B

Unit 5: Physiotherapy Techniques in Cardiac Disorders and Surgeries

PTCT 5.1. **Cardiac Surgeries**:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients' undergone cardiac surgeries

and

2. Demonstrate skills in providing physiotherapy care for the identified problems in clients undergone cardiac surgeries like
   1. CABG
   2. Valve repair and replacement surgeries
   3. Cardiac pacemaker insertion
   4. Surgeries to correct congenital heart disease

PTCT 5.2. **Cardiac Disorders**:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with cardiac disorders

   and

2. Demonstrate skills in providing physiotherapy care for the identified problems in clients with cardiac disorders
   1. IHD
   2. Cardiac Failure
   3. Rheumatic heart disease

PTCT 5.3. **Prioritise Physiotherapy related problems based on the assessment in providing cardiac care**

PTCT 5.4. **Plan physiotherapy care with rationale for the identified problems in clients with cardiac disorders**

PTCT 5.5. **Cardiac Rehabilitation**

1. Define cardiac rehabilitation
2. Discuss the need for cardiac rehabilitation
3. Appreciate the roles of other health care providers in cardiac rehabilitation
4. Demonstrate skills in performing Physiotherapy assessment in clients referred for cardiac rehabilitation
    i. Subjective assessment
    ii. Physical examination
    iii. Exercise testing
5. Prescribe exercise based on the assessment for the clients in cardiac rehabilitation programme

Unit 6: Critical care Physiotherapy

PTCT 6.1. Identify the common lines and tubes used in critical care units

PTCT 6.2. Interpret the ICU monitor and incorporate the findings in clinical decision making

PTCT 6.3. Analyse and Interpret the investigation procedures required to make physiotherapy diagnosis

PTCT 6.4. Identify and prioritize the problems which could be addressed by Physiotherapists

PTCT 6.5. Discuss the Indications, Precautions to be taken, advantages and disadvantages of commonly used Physiotherapy techniques based on available evidence.

PTCT 6.6. Design and discuss evidence informed physiotherapy protocol

Recommended Text Books for PTCT

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 for PTCT

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

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
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Since-2021

COURSE CODE: B.P.T-405

Course Title: Sports Physiotherapy and Exercise Prescription: (PTS) Theory (L) Practical (P)

PTS 1.0. **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.

PTS 1.0.1. **Course Outcomes**: **Sports Physiotherapy and Exercise Prescription:** 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 guide- lines
7. Understand the needs of specific population participating in sports

Course Contents: B.P.T PTS 405 (L)

SECTION -A

Unit I

PTS 1.1. **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

PTS 1.2. **Sports injuries:** types acute overuse, soft tissue injury Stages of healing principles of Treatment for soft tissue injuries- Acute, Sub acute and chronic stages.

PTS 1.3. **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

PTS 1.4. **Management of Common sports injuries:** sprain, strain, contusion, laceration Lateral ligament sprain of ankle. Rotator cuff injuries. Col- lateral 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

PTS 1.5. **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

PTS 1.6. **Rehabilitation in Sports**

SECTION -B

Unit 2

PTS 2.1. Physical fitness definition – component of physical fitness (strength, endurance, flexibility power, aerobic and anerobic capacity agility, coordination, body composition) - description

PTS 2.2. Assessment of physical fitness: Physical Activities Readiness Questionnaire, Fitness Screening for Mental and Physical Fitness tests of individual components of fitness, Body Mass Index

PTS 2.3. Health, fitness, and wellness promotion: principles, methods cardiopulmonary endurance (continuous, intermittent, fartlek), anaerobic capacity, strength, flexibility, agility, coordination, health education, healthy nutrition, balance diet, relaxation

PTS 2.4. Health, fitness, and wellness issues of specific population groups: childhood and adolescence, pregnancy, older adult's hypertension diabetes

PTS 2.5. Special ability in sports : Paralympics sports, types, classification of athlete, specific problems

PTS 2.6. Guidelines for Exercise Testing and Prescription Benefits and Risks Associated with Physical Activity.

PTS 2.7. Pre participation Health Screening

PTS 2.8. General Principles of Exercise Prescription

PTS 2.9. Exercise Prescription for Healthy Populations with Special Considerations and

PTS 2.10. Topics for Exercise Prescription for Populations with Other Chronic Diseases and Health Conditions, Overweight and Obesity

Practicals: B.P.T PTS 405 (P)

Students should be able to execute independently the following

PTS (P) 3.1. Pre-participation examination for risk factor identification

PTS (P) 3.2. Acute management of sports injuries

PTS (P) 3.3. Testing of various components of fitness

PTS (P) 3.4. Apply bandaging and taping for common sports injuries

PTS (P) 3.5. Plan exercise programme based on impairment and activity limitation

Recommended text books for PTS

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. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann

Recommended Reference Books for PTS

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. Kulund: The Injured Athlete, Lippincott.

COURSE CODE BPT 406

Course Title: Physiotherapy Ethics, Medico Legal aspects, Management and Administration : (PTLM) Theory (L)

PTLM 1.0. 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.

PTLM 1.0.1. **Course Outcomes**: **Physiotherapy Ethics, Medico Legal aspects, Management and Administration**

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

Course Contents: B.P.T PTLM 406 (L)

SECTION -A

Unit 1

PTLM 1.1. Concept of Morality, Ethics and Legality Personal values- ethical or moral values

PTLM 1.2. 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

PTLM 1.3. Professional ethics in research, education and patient care delivery

PTLM 1.4. 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

PTLM 1.5. code of professional conduct = Differences between professions and importance of team efforts Relationship with patients Relationship with Healthcare institutions Relationship with colleagues and peers Relationship with medical and other professional Referral relationships

PTLM 1.6. Salient features of Helsinki declaration, ICMR code of ethics of research involving human subjects Ethical principles of WCPT

Unit 2

PTLM 2.1. Laws governing Physiotherapy practice - AHCPCA. Consumer protection law, People with Disability Act Professional Indemnity insurance policy

PTLM 2.2. 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

PTLM 2.3. Development of Physiotherapy Profession

SECTION-B

Unit 3

PTLM 3.1. Introduction to management and administration meaning definition scope, principles, elements of management relevance of management to physio- therapy practice

PTLM 3.2. 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

PTLM 3.3. Organizing definition, steps in organizing, types of organization, organizational chart hierarchy, authority, power, responsibility, accountability, delegation of authority, centralization, decentralization

PTLM 3.4. Staffing: definition functions Manpower planning: according to organizational structure and needs Recruitment Training and development Appraisal Remuneration

PTLM 3.5. 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

PTLM 4.1. Directing: definition, nature significance, **principles of directing elements of directing function [supervision** communication, motivation, leader- ship

PTLM 4.2. Finance: MEANING, NATURE AND SCOPE OF FINANCE, Financial Goals, Finance Functions [investment decisions, dividend decisions, financial decisions] budgeting

PTLM 4.3. marketing, meaning, concept importance elements of marketing [product, price, promotion, physical distribution], branding, pricing, advertising publicity social marketing advocacy and sensitization

PTLM 4.4. Quality assurance: establishment of standards, audit – financial audit clinical audit, total quality management

PTLM 4.5. Setting of a Physiotherapy service unit Organization of physiotherapy department Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers

Recommended Text Books for PTLM

1. CM Francis Medical Ethics jay pee new Delhi
2. Raja K **Davis F** Ethical Issues: Perspectives for the Physiotherapists Jaypee 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 for PTLM

1. Hébert, P. C., & Rosen, W. (2009). Doing right: a practical guide to ethics for
2. medical trainees and physicians (p. 352). Don Mills, ON: Oxford University Press. American Medical Association, & New York Academy of Medicine. (1848).
3. Code of medical ethics. H. Ludwig &Company
4. Blackburn, S. (2003). Ethics: A very short introduction (Vol. 80). Oxford University Press.
5. Joydeep Das Gupta Hospital Administration and Management: A Comprehensive Guide jaypee brothers

COURSE CODE: B.P.T - 407

Course Title: Community Physiotherapy and Rehabilitation : (CPTR) Theory (L) Practical (P)

CPTR 1.0. 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.

CPTR 1.0.1. **Course Outcomes**: **Community Physiotherapy and Rehabilitation**

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 evaluation
12. Discuss the principles of **Occupational health** & Ergonomics

Course Contents: B.P.T CPTR 407 (L)

SECTION -A

Unit -1

CPTR 1.1. National District Level Community Program: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.

CPTR 1.2. 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.

CPTR 1.3. Assessment of disability in rural & urban setups. Healthcare delivery system & preventive measures with specific reference to disabling conditions. Community education program.

CPTR 1.4. Application of Physiotherapy skills at community level with special reference to the need at rural level.

CPTR 1.5. 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, Rockfeller, Ford foundation, CARE, RED CROSS

Unit 2

CPTR 2.1. Introduction of Rehabilitation & History

CPTR 2.2. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).

CPTR 2.3. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.

CPTR 2.4. Organization of Rehabilitation unit.

CPTR 2.5. Disability prevention evaluation & principles of Rehabilitation Management.

CPTR 2.6. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)

CPTR 2.7. Brief outline of Communication disorder & its implications on Rehabilitation process.

CPTR 2.8. Brief outline of psychosocial & vocational aspects of Rehabilitation.

CPTR 2.9. Introduction to Occupational therapy.

CPTR 2.10. Activities of daily living, functional assessment & training for functional independence.

CPTR 2.11. Brief outline of basic community medicine with special reference to community-based Rehabilitation, infrastructure and role of CBR

CPTR 2.12. Disability and Rehabilitation: concept and Definition, models of disability international classification of functioning Definition and concept of Impairment, Persons with Disabilities and Disability activity limitation, participation restriction, environmental factors, contextual factors Types. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation, Role of family members in the rehabilitation of a physically Persons with Disabilities. PWD Act 1995 and Rights of person with Disability Act 2016, National Trust Act (Note whereever applicable: The Gazette of India is regularly updated, and its publications can change over time. Refer the recent Gazette publications issued by the Government of India, from the official website)

CPTR 2.13. 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.

CPTR 2.14. Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings. GOI guidelines

CPTR 2.15. Principles of Orthotics- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

1. Orthotics for the Upper Limb
2. Orthotics for the Lower Limb
3. Orthotics for the Spine

CPTR 2.16. Principles of Prosthetics –types, indications, contraindications, assessment check out, uses and fitting – region wise

CPTR 2.17. Assistive devices and Technologies.

CPTR 2.18. 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

CPTR 3.1. Identification, assessment and classification of intellectual disabilities Etiogenesis and principles of management including prevention Rehabilitation of the Subnormality of Intelligence, including vocational training & home education programme

CPTR 3.2. Principles & mechanisms of Communication including speech & hearing, Common disorders of speech & hearing – etiogenesis, clinical features, assessment & principles of management

CPTR 3.3. Identification, assessment and classification of visual disabilities Etiogenesis and principles of management including prevention Rehabilitation of the Subnormality of Intelligence, including vocational training & home education programme

Unit 4

CPTR 4.1. Vocational and social rehabilitation vocational and social aspects of disability, including evaluation & vocational goals for people with disability Role of social worker in rehabilitation

CPTR 4.2. 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,

CPTR 4.3. 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

CPTR 4.4. **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: B.P.T CPTR 407 (P)

CPTR (P) 5. 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 for CPTR

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 Living- stone
7. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.

Recommended Reference Books for CPTR

1. Status of Disabled in India -2000-RCI publication
2. Legal Rights of disabled in India- Gautam Bannerjee
3. ICF –WHO Health Organisation 2001 publication
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.

Course Code B.P.T 408 Project Work

Course Title: Project Work: (PW)

PW 1.0. RESEARCH PROJECT-

1. 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

2. 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

3. 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

4. The internship assessment weightage will be based on following criteria:

   Domains (% of the total marks)

   a) Attendance (10%)

   b) Log book (60%)

   c) Project (30%)

   of the internship assessment

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION: Should be the regular part of clinical education from third year on wards

Course code: B.P.T 409 : CLINICAL Rotation (CLRo)

CLRo 1.Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physio- therapy 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

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Since-2021

4.29.4. Skill Based Outcomes And Monitor Able Indicators For Bachelor Of Physiotherapy

Bachelor of Physiotherapy Competency Statements are mentioned on 4.29. The skill based learning outcomes, knowledge and monitorable indicators to be ascertained after studying the B.P.T curriculum are indicated in Table 4.17.

Table 4.17: The Skill based Learning Outcomes, Knowledge and monitorable indicators:

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
1.	Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes	i. Able to Collect and review back-ground information relevant to the client's health. ii. Understands the client's expectations related to Physiotherapy services. iii. Able to Collect and review health information about the client from other sources (e.g., other sources may include previous health records, other Healthcare practitioners, professional col-leagues, or family). iv. Identify client's prior functional abilities, physical performance, and participation. v. Identifies the client's personal	a. Develop rapport to obtain history and current health status b. Use interviewing skills appropriate to the patient/client c. Obtain a relevant history and current health status. d. Interpret the patient's/client's verbal and non-verbal responses. e. Determines the personality traits. f. Analyze how the differences in personality influence approach
2.	Collects assessment data relevant to the client's needs and physiotherapy practice.	i. Informs the client of the nature and purpose of assessment as well as any associated significant risk.	a. Perform patient assessment technique which includes to know the condition and to gather in- formation about his/her ailment. b. Monitors the client's health status for significant changes during the course of assessment and takes appropriate actions as required. c. Perform assessment procedure safely and accurately, taking into account client consent, known indications, guidelines, limitations and risk benefit considerations.

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	i. Be familiar with different assessment techniques. ii. 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. iii. Be familiar with special tests. iv. Basic knowledge on radiological findings & other investigations. v. Demonstrate clinical reasoning with choice of assessment and examination procedure	a. Safely and accurately examines and reexamines a patient using standardized measures. b. Apply pertinent tests and measurements. c. Interpret all assessment findings to allow for identification of the patients/client's impairments, activity limitations and participation restrictions.
4.	Analyzing assessment findings & establish a physiotherapy diagnosis and prognosis.	i. Identifies the nature and extent of the client's impairments, activity limitations and participation restrictions within the context of the client's needs. ii. Identifies environmental and personal supports and barriers relevant to the patients. iii. Determines the relationship among the assessment findings.	a. Interpret findings and reach a differential diagnosis b. Establishes a diagnosis for Physiotherapy, identifies risks of care, and makes appropriate clinical decisions based upon the examination, evaluation and current available evidence. c. Formulates a Physiotherapy diagnosis based on the analysis of patient's assessment findings. d. Discusses Physiotherapy diagnosis and prognosis with the patient & care givers

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
5.	Develops and recommends an intervention strategy.	i. Establishes and prioritizes, with the patient, expected outcomes based on the assessment findings and evidence-informed practice. ii. Recommends a service approach consistent with the client's needs, goals and all available resources. iii. Discuss the current patient condi-tion among multi- disciplinary team	a. Establishes goals that are specific, measurable, action oriented, realistic, and time-specific. b. Selects interventions that are evidence based and consistent with the client's goals, general health status, functional needs, and assessment findings. c. Identifies when Physiotherapy services are not required or indicated and refers for other services as appropriate.
6.	Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan	i. Know the patient mental and physical condition	a. Operate the most appropriate equipment for the individual patient within the context of the protocol.
7.	Implements intervention	i. Orients the client to the practice setting and provides information about relevant service/ policies (e.g., lo- cation, duration, frequency, cost; introduce client to all staff involved in their care; expected completion of service).	a. Performs physiotherapy interventions in accordance with client consent and in a safe and effective manner. b. Educates the client about health promotion, self-management, and relevant services with respect to his/her unique condition.
8.	Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises	i. Discuss the importance of exercises and how it should be carried out ii. Be familiar with the treatment plans for all patients on the treatment unit iii. Identify the comorbidities that will impact on patient condition iv. Recognize if any adverse reactions is occurring	a. Interpret the treatment plan and use the equipment accordingly b. Teach patients the exercise procedures and methods of doing them. c. Evaluate the patient's general condition prior to commencing the exercises. d. Analyze the information and integrate to define the optimal patient condition

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
9.	Advise patient on appropriate nutrition, exercises, rest, relaxation other issues	Explain the impact of exercise and nutritional status of patient during treatment	a. Assess the patient's status after exercise and proper diet.
10.	Evaluates the effectiveness of interventions.	i. Discuss with the client, the nature, purpose and results of ongoing assessment and outcome evaluations. ii. Consults with the patient to redefine goals and modifies or discontinues intervention strategies as necessary.	a. Monitors client responses and changes in status during the interventions and modifies intervention accordingly. b. Evaluates effectiveness of the intervention strategy on an ongoing basis using appropriate outcome measures. c. Assesses client status prior to the completion of physiotherapy service and compares with initial assessment findings. d. Communicates with the client about service completion & recommends self-management option.
11.	Be able to complete accurate treatment documentation.	i. Recognize the importance of accurate transfer of information to allow for accurate treatment set-up according to the treatment plan and prescription. ii. Know what should be included & whom or where the documentation and information should be sent. iii. Be aware of the ethical issues relating to documentation	a. Ensure that the ethical and legal requirements of documentation are completed. b. Ensure legible, accurate and timely records are maintained. c. Ensure statistical information is recorded and accessible.
12.	Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.	i. Be familiar with the psychological status of the patient. ii. Knowledge of few counseling procedures.	a. Demonstrates sensitivity to the uniqueness of others. b. Listens effectively and facilitates discussion to ensure reciprocal exchange of information. c. Demonstrates an awareness of self behaviours and the responses of others and adapts communications appropriately. d. Able to assess psychological status of patient.

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
13.	Establishes and maintains inter professional relationships, which foster effective client-centered collaboration.	i. Integrates knowledge and understanding of the physiotherapist role and the roles of others in pro- viding client-centred care. ii. Consults and shares relevant information with clients, other health professionals, and all relevant individuals or groups in a timely manner.	a. Demonstrates an understanding of and respects the roles, responsibilities and differing perspectives of team members. b. Practice in accordance with legislation regulations and ethical guidelines. c. Fosters collaboration with relevant others.
14.	Understand the principles of continuous quality improvement	i. Identify the components of a quality plan. ii. Discuss the role of quality assurance such as principles of an accreditation/audit programme iii. Undertake peer review and self-evaluation	a. Modify and adapt professional practice in response to evaluation and/or feedback from the patient/client, peer, supervisor Contribute to inservice activities b. Reflect on the outcomes of interventions and modify practice accordingly
15.	Be able to carry out the daily/ weekly Quality Control (QC) checks	i. Explain Quality Management System (QMS), Quality Assurance (QA) and Quality Control (QC)	a. Perform the daily / weekly/ monthly QC procedures
16.	Be able to review the literature	i. Define search terms for specific treatment sites	a. Identify the appropriate literature in the area of interest. b. Identifying research gap.
17.	Be able to suggest implementation of research findings	i. Identify relevant sources of Research	a. Evaluate research with b. respect to current departmental practice
18.	Be able to suggest/ initiate topics for Physiotherapy research	i. Identify literature to support research proposal ii. Define the necessary steps in preparing and carrying out research	a. Review the literature in the area. b. Formulate a research question. c. Conducts research systematically.
19.	Be able to interpret, apply and disseminate information as a member of the Physiotherapy team	i. Define and explain the data that must be disseminated	a. Identify the appropriate personnel to whom specific information should be disseminated. b. Communicate the correct, relevant and appropriate information

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CHAPTER 5

Curriculum

MASTER OF PHYSIOTHERAPY

[M.P.T]

Master of Physiotherapy [M.P.T]

Masters of Physiotherapy

5.0 Introduction:

5.0.1. The Master's program in Physiotherapy is designed to provide advanced education and specialized training in the field of physiotherapy. The program aims to produce highly competent practitioners capable of addressing the diverse and evolving healthcare needs of the population. This comprehensive program combines in-depth theoretical knowledge with extensive practical skills, focusing on evidence-based practice, clinical reasoning and research methodologies in various specialties such as musculoskeletal science, neuroscience, cardio-pulmonary science, sports science, pediatrics and neonatal science, obstetrics and gynecological science, oncology, community physiotherapy and many more as the profession evolves.

5.0.2. On successful completion of M.P.T programme, the Physiotherapist will be able to practice in his / her specialty area with advanced knowledge and skills, take up physiotherapy teaching assignments independently for undergraduate teaching programme, as well as will be able to design and undertake research (using sound data processing techniques and statistical methods) independently in the field of physiotherapy.

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

1. Able to execute all routine physiotherapeutic procedures based on evidence-based practice.
2. Able to apply advanced assessment techniques to identify and treat various conditions needing physiotherapeutic procedures.
3. Able to develop individualized treatment plans and implement advanced therapeutic techniques independently based on evidence-based practice and clinical guidelines.
4. Able to provide adequate knowledge about the treatment procedures and its benefit to patients, families and other healthcare professionals.
5. Able to transfer knowledge and skills to students as well young professionals.
6. Able to design and undertake independent research studies.
7. Able to critically appraise and apply current research in clinical practice.
8. Able to apply multidisciplinary practice skills and be a prominent member of the team.
9. Able to practice and assess patient independently.
10. Able to develop and apply leadership skills necessary for roles in clinical settings, academia and healthcare administration.

5.1. 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 skills in Physical and Functional diagnosis pertaining to patient under his/her care.
5. Demonstrate ability to critically appraise recent primary and secondary literature from journals and adopt diagnostic and therapeutic procedures based on it.
6. Perform independent research within the department and help the department and the team for treatment planning of the patient.
7. Engage in continuous professional development and lifelong learning to stay abreast with the advancement and new technology in the field. The professional should opt for continuous professional education credits offered by national and international institutes recognized by the NCAHP.
8. 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.
9. Demonstrate an expertise in evidence-based skill in the management disorders including movement dysfunction in concerned specialty.
10. Demonstrate an expertise in health promotion, early identification and intervention for quality restoration of function.
11. 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
12. Demonstrate proficiency in creating awareness using newer technology, at various levels in community for Healthcare and professional awareness.
13. Demonstrate leadership, managerial, administrative and communication skills.
14. Demonstrate the knowledge of legislation applicable to compensation for functional disability welfare schemes and rights of the disabled, laws related to industrial workers and disabled and appropriate certification.
15. Demonstrate proficiency in classroom and clinical teaching using newer and appropriate technology.

5.2. Eligibility for admission:

5.2.1. Selection procedure:

1. He/she has passed the Bachelor of Physiotherapy recognized by any recognized 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 at the State/ University level. 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/State government as per the syllabus.
    b) Successful candidates based on written test will be called for the interview and shall have to face an interview board. The 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/ physical fitness on the notified date(s) will forfeit the claim for admission.

5.3. Duration of the course

Duration of the course: 2 Years Total minimum hours – 3240

5.4. Medium of instruction:

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

5.5. Attendance:

A candidate will be permitted to appear for the University Examination if he / she secures 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 year/final examination conducted by the university.

5.6. Methods of training

The training of the MPT student shall be conducted on a full-time basis, with progressively increasing responsibilities in the management and treatment of patients assigned to their care. Acquisition of practical competencies being the keystone of post graduate education, the 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. Participation of all the students in all facets of educational process is essential and each candidate should take part in seminars, group discussions, clinical rounds, case presentations, clinics, journal review meetings and continuous professional education (CPE). Training should also include involvement in clinical research studies and every Masters' candidate should be engaged in the teaching and training programs of undergraduate Physiotherapy students.

5.7. Formal teaching sessions [minimum]

Master's candidate should be subjected to at least 4-hrs of formal teaching per week per subject. The departments may select a mix of the following sessions:

Journal club once a week Seminar;

Lecture twice a week

Case discussions twice a week

Interdepartmental case or seminar once a week

5.8. Assessment:

It is essential to monitor the learning progress of each Master's candidate through continuous appraisal and regular assessments. It not only helps teachers to evaluate the 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. The assessment may be structured using checklists that assess various aspects of competencies. Also stated in 5.15

5.9. Log book

5.9.1. Every candidate shall maintain a log book and record his/her participation in the training programs conducted by the department such as journal reviews, seminars etc. Candidates must also record research presentations and details of clinical research studies, if any.

5.9.2. The log book shall be scrutinized and certified by the Head of the Department (HoD) and Head of the Institution and presented in the university examination.

5.10. Periodic tests

1. The College may conduct periodic tests based on the pattern of university examination. Such tests may include written theory papers, practical, viva voce and clinical assessment. Records and marks obtained in such tests will be maintained by the HoD and shall be produced as and when called for.

2. The assessment will be a combination of formative and summative assessments-

    i. Theory, inter-departmental meeting

    ii. Practical- clinical rounds and bed side evaluation and application.

iii. Teaching Activities – UG Teaching

iv. Learning Activities: Self Learning, use of computers and library

v. Participation in departmental activities;

   a. Journal review meetings

   b. Seminars

   c. Clinical presentation

   d. Special clinics

   e. Inter departmental meetings

   f. Community work, camps / field visits

   g. Clinical rounds

   h. Dissertation work

vi. Participation in conferences/ presentation of paper -Minimum 2 in two years

vii. Any other – Specify (eg: CPE)

viii. Rotation and posting in other departments for a maximum of 6 months the candidate must spend 18 months in the department of specialty concerned

5.11. Graded responsibility in the care of patients and operative work (Structured training schedule of clinical and elective subjects only)

Table 5.1: **Graded responsibility in the care of patients and operative work**

Category	I year MPT	II year MPT
O	20 Cases	20 Cases
A	20 Cases	30 Cases
PA	100 Cases	75 Cases
PI	25 Cases	50 Cases

Key: O – Observes

A – Assists a senior Physiotherapist

PA – Performs procedure under the direct supervision of a senior specialist.

PI – Performs Independently

5.12. Intake of Students

The PG teacher/ guide to student's ratio shall be 1:3 for admission in M.P.T. first year and cannot be increased in any case. The guide should be of the same specialty stream. The intake of students to the course shall be at the starting of academic year only.

Maximum 24 students can be admitted per academic year in an institution.

5.13. Guide

1. To be recognized as a guide, one must have a minimum of 5 years' of teaching experience after post-graduation as a lecturer/assistant professor.
2. Guide should be of the same elective/ specialty stream as of student.
3. Change **of Guide:** In the event of registered guide being unavailable for any reason, the guide for the concerned students may be changed with prior permission from the university as per the following guidelines

   Students cannot be left without a guide for more than 3 months in total during their post-graduation study (i.e. in the event of resignation of guide, the college should appoint a guide within 3 months)

5.14. For student benefit, services of **visiting faculty** can be utilized, but these faculty members will not be counted in the PG teachers

5.15. Assessment:

1. **FORMATIVE ASSESSMENT:** Formative assessment should be continuous and should assess clinical knowledge, patient care, procedural and 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:
   i. Journal based / recent advances learning
   ii. Patient based /Laboratory or Skill based learning
   iii. Self-directed learning and teaching
   iv. Departmental and interdepartmental learning activity
   v. External and Outreach Activities. The assessment may be structured using checklists that assess various aspects of competencies.

2. **SUMMATIVE ASSESSMENT**

i. **Theory Examination:** Clinical / Practical and viva voce Examination: All examiners shall be recognized post graduate teachers. At least 50 % of total examiners shall be externals. (from Other universities)

ii. **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.

iii. **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 institutions and one of these two must be from outside the State**.**Practical examination should be conducted in two days:

a. On day one- clinical examination (OSCE and OSPE), should be conducted.

b. On second day dissertation should be examined along with teaching skills and viva voce. Student shall make a 15-minute presentation of the dissertation followed by 10-minute question and answer session by the examiners.

iv. Marks to be awarded separately be each examiner and an average shall be taken as the final marks awarded to the student in both practical as well as dissertation.

Resolution No. 5.20 of Academic Council (AC-53/2026): Resolved to approve the proposed maximum duration of 4 years for the MPT programme and the schedule for supplementary examinations within 40–60 days after declaration of results, to be implemented from the Academic Year 2026 –2027 onwards for both the campuses - Navi Mumbai and Chhatrapati Sambhajinagar.

5.16. Examiners:

A Postgraduate Physiotherapy examiner should be a recognized PG teacher of same elective/ specialty.

5.17. Essential Requirements for MPT Institution

All existing Physiotherapy colleges/ institute will continue to impart Physiotherapy education provided that following conditions are fulfilled: (Also refer Annexure 2 and 3)

1. **Eligibility : Any government /Private / Self Financing Educational Trust /Charitable Trust/Society/Company registered under the relevant Act; applicant will be eligible to apply.**

a. College should be running BPT programme for last 5 years with atleast one batch of BPT students having graduated from the institute.

2. **Physical infrastructure**

Whole campus should be accessible for persons with disabilities.

3. **Administrative Office Land and space requirement**

   i. **There shall be no separate land required for starting MPT course subject to fulfillment of eligibility criteria to start the MPT program. However, the essential requirements in terms of physical infrastructure, Manpower as given below must be furnished**

      a. Rooms for faculty [per specialty]

         Professor 1

         Associate professor 1

         Assistant professor 2

      b. Common room for students

      c. Toilets for men

      d. Toilet for women

      e. Classroom - 02 rooms of 400 sq.ft. (each).

      f. 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 as mentioned in Annexure 2 and 3.

      g. Standalone MPT institute must have Exercise therapy/ Kinesiotherapy Lab and Electrotherapy Lab (with atleast one equipment of each category as mentioned for BPT Program)

4. **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/specialty. In addition, reference books,

   Audio visual facility, Slide projector, Computer, Internet facility is to be provided.

5. **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.

6. **Human resource requirement Teaching Faculty per speciality:**

1. Staff Requirement (Faculty to student ratio)

Professor 1:3

Assoc Prof 1:2

Asst prof 1:2

2. Requirement : Professor 1, Associate professor 1, Assistant professor 2

3. Services of visiting faculty can be utilized, but these faculty members will not be counted in the PG teachers and they cannot register candidates

4. Non-teaching staff

Office superintendent/ assistant 1

Computer operator 1

Lab assistant / demonstrator - BPT 1

5.18. Proposed Paper Style: MPT

1. Theory paper : Duration: 3 Hours , Total Marks: 100

Table 5.2. Type of Theory question paper and Question type for M.P.T and Marking scheme

Sl. No.	No. of Questions	Question Type	Marks
1	1	Long Answer	1 x 20 = 20
2	1	Long Answer	1 x 20 = 20
3	1	Long Answer	1 x 20 = 20
4	1	Long Answer	1 x 20 = 20
5	1	Long Answer	1 x 20 = 20
Total			**100**

2. University Practical Exam: Total marks = 450

Table 5.3.: Practical Exam Scheme and marks disrtribution for M.P.T

Sl. No.	Exams	Marks
1	ONE Clinical case presentation-Major Elective	1 x 150=150
2	TWO Clinical Presentation -Minor Elective	2 x 75 = 150
3	OSPE/OSCE	100
4	Dissertation Presentation	50
Total		**450**

5.19. SCHEME OF STUDY MASTER OF PHYSIOTHERAPY (M.P.T.)

5.19.1. First Year M.P.T Examination Scheme

Table 5.4. First Year M.P.T Examination Scheme

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	M.P.T -101 Laws, Ethics, Administration Educational methodology (LEM)			100			100	90		90	6		6
2	M.P.T-102 Research methodology and biostatistics, EBP (RMB)			100			100	90		90	6		6
3	M.P.T - 103 Biomechanics & Therapeu-Tics (BCT)			100			100	90		90	6		6
4	M.P.T -104 *Physical & Functional Diagnosis in the speciality.* Speciality paper-1			100			100	120	120	240	8	4	12
5	M.P.T-105 Skills acquisition and refinement (SAR-I)	(Teaching Assignment, Seminars, journal club & Case Studies etc.)							240	240		8	8

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
6	M.P.T-106 Clinical training (CT-I)								690	690		23	23
7	M.P.T-107 Dissertation (DSS-I)								90	90		3	3
	Grand Total						400	390	1140	1530	26	38	64

i. N.B.-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.)

5.19.2. 2ND Year M.P.T Examination

Table 5.5. Second Year M.P.T Examination Scheme

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	M.P.T-201 Exercise Physiology (EP)			100			100	90		90	6	0	6
2	M.P.T-202 *Specialty Paper 2*			100			100	120	120	240	8	4	12
3	M.P.T-203 *Specialty paper 3(Recent advances in the specialty)*			100			100	120	120	240	8	4	12

S. No.	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
4	M.P.T-204 Dissertation [spread over a period of 18 months] (DSS-II)								660	660			22
5	M.P.T-205 Skills acquisition and refinement (SAR-II)	(Teaching Assignment, Seminars, journal club & Case Studies etc.)							240	240		8	8
6	M.P.T-206 Clinical training (CT-II)								660	600		20	20
	Theory Total						300	330	1740	2070	22	58	80
Practical Marks													
7	Major Elective					150	150						
8	Two Minor Elective					150	150						
9	OSPE/OSCE					100	100						
10	Dissertation					50	50						
	Practical Total					450	450						
Grand Total							750	330	1740	2070	22	58	80

N.B.-

i. 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.

ii. 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.

5.20. Curriculum Outline and detailed Curriculum

1. **Common subjects for all PG**
    1. Laws, Ethics, Administration and Educational methodology
    2. Research methodology, biostatistics and EBP
    3. Biomechanics and Therapeutics
    4. Locomotor Disability Assessment : *To be taught in First year as a part of syllabus*
    5. BLS and ALS- *To be taught in First year as a part of syllabus*
    6. Disaster Management – *To be taught in First year as a part of syllabus*
    7. Exercise physiology
    8. Dissertation
    9. Practical / clinical examination
2. General design for specialties
    1. Clinical and functional diagnosis in specialty
    2. Concepts of specialty
3. 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 Gynecology science
    7. Master of Physiotherapy in Oncology science
    8. Master of Physiotherapy in Community Rehabilation

5.20. M.P.T. Curriculum

5.20.1. COURSE CODE -M.P.T-101

COURSE TITLE - **Laws, Ethics & Administration and Eductional Methodology: (LEM)**

Course Contents: M.P.T LEM Theory (L)

SECTION -A: ETHICS AND LAW

LEM 1.1. Principles of ethics History and evolution of ethics - Helsinki declaration; Nuremberg Code; Principles of ethics and its importance - Autonomy, Beneficence, Non-maleficence, Justice

LEM 1.2. Professionalism

LEM 1.3. Ethics in professional practice Principles of practice in respective profession. Privacy, confidentiality, shared decision making, informed consent, equality and equity, justice

LEM 1.4. ICMR Guidelines General principles, Responsible conduct of research, Risk benefit assessment

LEM 1.5. Informed Consent Process Components of informed consent document, Procedure in obtaining informed consent, Special situations, waivers, and proxy consent

LEM 1.6. Roles and Responsibilities of IEC Ethical Review process, Classification of projects for review, Roles and responsibilities of members, Communications with investigators and authorities

LEM 1.7. 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

LEM 1.8. Conflict of Interest Definition and Types of Conflict of Interest, Identifying, mitigating and managing Conflict of Interest, Conflicts of interest in international collaborations

LEM 1.9. Publication Ethics Importance of publishing, Authorship guidelines according to ICMJE, Plagiarism

LEM 1.10. 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

LEM 2.1. Principles and applications of Management and Administration to Physio Therapy practice:

LEM 2.2. Management PROCESS: planning, organizing, staffing, finance, marketing, controlling, directing.

LEM 2.3. Quality assurance: Total Quality Management: basis of quality management, qualityassurance program in hospitals, medical audit and international quality system.

LEM 2.4. COMMUNICATION: Process of Communication Barriers to Communication Types of Communication Written vs. Oral Communication Elements of good communication

LEM 2.5. Hospital as an organization: functions and types of hospitals MANAGEMENT IN HOSPITAL Setting of a physiotherapy service unit

SECTION-C: Management of Teaching Institution and Educational Methodology In Physiotherapy

LEM 3.1. 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

LEM 3.2. Basics of Adult Learning Theories including Learning Styles and Motivation

LEM 3.3. 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

LEM 3.4. Teaching skills, Teaching Methods in Classroom Setting, clinical teaching methods, planning of teaching: lesson planning and unit planning Teaching aids and educational technology

LEM 3.5. Formulating Intended Learning Outcomes Including Tyler's principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition

LEM 3.6. **Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities,**

Recommended books for LEM

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. Natio4n2a6l 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. New Delhi.

5.20.2. COURSE CODE -M.P.T-102

COURSE TITLE - Research methodology and Biostatistics and Evidence based practice (RMB)

Course Contents: M.P.T RMB Theory (L)

SECTION-A: RESEARCH METHODOLOGY

RMB 1.1. Introduction to research

RMB 1.2. Types of research

RMB 1.3. Defining a research question

RMB 1.4. Qualitative study designs

RMB 1.5. Quantitative study

RMB 1.6. Type I and type II bias

RMB 1.7. Study design: types

RMB 1.8. Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.

RMB 1.9. Sampling design, calculating minimum sample size based on design

RMB 1.10. Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.

RMB 1.11. Outcome measures: Use of outcome measures in rehabilitation research

RMB 1.12. Research Methods: Designing methodology, Reporting results, Type I and Type II bias.

RMB 1.13. Communicating research.

RMB 1.14. Evaluating published research: looking at the evidence

RMB 1.15. Introduction to evidence-based practice, evaluating evidence,

RMB 1.16. Asking clinical questions

RMB 1.17. Translating of evidence into practice: strategies

RMB 1.18. Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

SECTION-B: BIOSTATISTICS

RMB 2.1. Descriptive Statistics and measurement variability

RMB 2.2. Inferential Statistics

RMB 2.3. Comparison of group means: T-test

RMB 2.4. Analysis of variance

RMB 2.5. Multiple comparison tests

RMB 2.6. Parametric and Non parametric tests

RMB 2.7. Correlations

RMB 2.8. Regression

RMB 2.9. Analysis of frequencies: Chi square

RMB 2.10. Statistical measure of validity and reliability

RMB 2.11. Factorial Design analysis

RMB 2.12. Power analysis – Determining sample size, Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio

RMB 2.13. Application of various statistical software.

SECTION-C: SCIENTIFIC WRITING

RMB 3.1. 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).

RMB 3.2. Publication – Role of author, Guide, Co-authors.

RMB 3.3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research

RMB 3.4. 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.

RMB 3.5. Structure of Thesis and Content – Preparing Abstracts.

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Recommended books for RMB

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)

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5.20.3.COURSE CODE -M.P.T-103

COURSE TITLE -BIOMECHANICS & THERAPEUTICS (BCT)

Course Contents: M.P.T BCT Theory (L)

SECTION A – Concepts of Biomechanics:

BCT 1.1. Introduction to Kinesiology and Biomechanics. Biomechanics of Tissues and structures of the musculoskeletal system

BCT 1.2. Principle of Biomechanics

BCT 1.3. Nature and importance of Biomechanics in Physiotherapy.

BCT 1.4. Methods of kinetics and kinematics investigation

BCT 1.5. Introduction to biomechanical analysis of human motion.

BCT 1.6. Analytical tools and techniques –

1. Isokinetic Dynamometer,
2. Kinesiological EMG,
3. Electronic Goniometer,
4. Force Platform,
5. Videography.

BCT 1.7. Upper Extremity: Shoulder and Shoulder girdle, Elbow joint, Wrist joint and Hand.

BCT 1.8. Lower Extremity: Pelvic Girdle, Hip joint, Knee joint, Ankle & Foot

BCT 1.9. Spine

BCT 1.10. Gait

BCT 1.11. Gait Analysis: Kinetic & Kinematic Analysis.

BCT 1.12. Pathological Gait: Kinetic & Kinematic Analysis

BCT 1.13. Ergonomic approach to lifting and handling, workspace and environment. Patient positioning, body mechanics and Transfer techniques

SECTION-B: Physiotherapy techniques

BCT 2.1. Principle of therapeutic exercises

BCT 2.2. Definition, details of effects and uses of following exercises.

BCT 2.3. Dynamic Exercises

BCT 2.4. Plyometric Exercises

BCT 2.5. Isokinetic Exercises

BCT 2.6. Kinetic chain exercises

BCT 2.7. Balance and coordination exercises

BCT 2.8. Biophysics of contractile and non-contractile tissues, Response to mechanical loading

BCT 2.9. Clinical reasoning and differential clinical diagnosis based on various approaches such as Maitland, Kaltenborne, Cyriax, Mulligan, Mckenzie etc.

BCT 2.10. Proprioceptive neuromuscular Facilitation,

BCT 2.11. Hydrotherapy Techniques

BCT 2.12. Functional assessment and re-education

BCT 2.13. 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.

BCT 2.14. Electro diagnosis: introduction to methods of electro diagnosis SD CURVE

BCT 2.15. Electromyography: technique of EMG, interpretation of normal and abnormal responses

BCT 2.16. 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.

BCT 2.17. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP, SSR.

BCT 2.18. 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:

1. Superficial heating modalities
2. Deep heating modalities
3. Ultrasound
4. Cryotherapy

BCT 2.19. 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

BCT 2.20. Low Frequency Current: Diadynamic Current, Iontophoresis

BCT 2.21. High Voltage, Pulsed Galvanic Stimulation, TENS, IFT, Russian Currents. LASER

BCT 2.22. Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars, keloids, Muscle Plasticity & Integumentary Conditions.

BCT 2.23. BIO-FEED BACK

Recommended books for BCT

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.
8. Davis.
9. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders.
10. Northrip et al: Analysis of Sports Motion: Anatomic and Biomechanics perspectives,
11. W.C. Brown Co., IOWA.
12. Leveac B.F.: Basic Biomechanics in Sports and Orthopedic Therapy, C.V. Mosby.
13. De Boer & Groot: Biomechanics of Sports, CRL Press, Florida.
14. Basmajian - Muscle alive - Williams & Wilkins.
15. Nordin & Frankel - Basic Biomechanics of Muscular Skeletal Systm - Williams & Wilkins.
16. Bartlet - Introduction to Sports biomechanics - F & FN Spon Madras.

5.20.4. Locomotor disability Assessment content:

DISABILITY (PERMANENT PHYSICAL IMPAIRMENT) ASSESSMENT AND CERTIFICATION GUIDELINES & GAZETTE NOTIFICATION:

Detail study of Government Gazette to be done: (The Gazette of India is regularly updated, and its publications can change over time. Refer the recent Gazette publications issued by the Government of India, from the official website)

PWD Act 1995 and Rights of person with Disability Act 2016, **to study in detail.**

5.20.5. BLS and ACLS Training:

Course Title: Basics of Emergency Care and Life Support Skills (ECLS): Theory (L) Practical (P)

ECLS 1.0. 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 auto- mated 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 knowledge and skill besides the lecture - demonstrations.

ECLS 1.0.1. 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.

Course Contents:

SECTION -A

UNIT 1

ECLS 1.1. Emergent conditions and magnitude, Concept of golden hour, Duties and responsibilities of first responder

ECLS 1.2. Ethical issues and Gather information from observation, experience and reasoning. Identification of rapidly changing situations and adapt accordingly. Planning and organization of work. Scene safety. Dealing with emotional reactions family members and bystanders

ECLS 1.3. Well-being of first responder Personal protection

1. Steps to be taken against airborne and blood-borne pathogens
2. Personal protective equipment necessary for each of the following situations: Hazardous materials Rescue Operations Violent Scenes Crime scenes
3. Electricity, Water and ice
4. Exposure to blood-borne pathogens Exposure to airborne pathogens

UNIT 2

ECLS 2.1. Airway

1. Signs of inadequate breathing
2. Mechanism of injury to opening the airway
3. Steps in the head-tilt chin-lift
4. Steps in the jaw thrust
5. Taking out foreign body
6. Ensuring patent airway during seizures and vomiting.

ECLS 2.2. Ventilation

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

ECLS 2.3. Circulation

1. Evaluate the cardiac status of the patient
2. Determine the need for and take necessary action to proper circulation
3. Steps for control of bleeding: Pressure bandage and tourniquet

ECLS 2.4. Clearing a foreign body airway obstruction

ECLS 2.5. CPR

1. Implications of cardiac arrest
2. Cardiopulmonary resuscitation (CPR)
    i. How it works
    ii. Steps
    iii. When to stop CPR
3. Brief overview of AED Automated external defibrillator (only demonstration –no hands on)

SECTION -B

UNIT 3

ECLS 3.1. Bleeding and Soft Tissue Injuries

1. Difference between arterial and venous bleeding
2. Stopping external bleeding
3. Identification of Internal bleeding
4. types and Functions of dressings and bandages
5. How to help a victim of burn injury

ECLS 3.2. Injuries to Muscles and Bones

1. Suspecting bony/spinal injury
2. Splinting –materials used
3. Importance of splinting

UNIT 4

ECLS 4.1 Medical Emergencies

ECLS 4.2 Identification of the patient steps in providing first aid to a patient with

i. A general medical complaint –

ii. Seizures

iii. Chest-pain

iv. Shortness of breath

v. Exposure to heat

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

vii. Drowning

viii. Poisoning

ECLS 4.3 Transportation Importance of timely and proper transportation methods of transportation of victim from site of injury to ambulance. Importance of spine protection methods of spine protection during transportation

ECLS 4.4 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

ECLS (P) 5.1. Provide Airway & Ventilation

ECLS (P) 5.2. Perform Basic Life Support: CPR

ECLS (P) 5.3. Perform Initial management of Thermal injury, electric injury

ECLS (P) 5.4. Perform stabilizing injured extremity and wound management

ECLS (P) 5.5. Demonstrate bandaging techniques to various body parts

ECLS (P) 5.6. Demonstrate Extrication, Helmet removal and spine protection

ECLS (P) 5.7. Demonstrate Stretcher use

Recommended text books for ECLS

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

5.20.6. **Disaster Management:**

Course Title: Disaster Management (DM): Theory (L)

DM 1.0 Subject Description and instruction to teacher: The commission's goal is to emphasize the vital role physical therapists (physios) play in disaster management and contribute to national and global preparedness. To achieve this, it's essential to raise awareness among physiotherapists about national and international organizations and emphasize the crucial role physical therapists play in disaster management, particularly within Emergency Medical Teams. Also it may be noted that the acts, policies, gazettes are regularly updated, and its publications can change over time. The teachers and students should thus refer the recent publications issued on the official website

DM 1.0.1. Course Outcomes: After completion of this course the student shall be able to

1. Understand the crucial role physical therapists play in disaster management, particularly within Emergency Medical Teams.
2. Should be able to identify national and international organizations that play a vital role in disaster management
3. Should be able to identify the legal framework for disaster management in India and disaster prone areas.
4. Provide essential information to other physical therapists interested in disaster response work and to make them aware of national and international agencies already active in the field.
5. Promote global preparedness and support physical therapists in making a meaningful difference in disaster response and recovery efforts

Course Content: Disaster Management (DM): Theory (L)

DM 1.1. Definition of disaster and the hazards associated with disaster, Vulnerable groups in Disaster

DM 1.2. Definition of Advocacy, disability advocacy, Contingency planning wrt to disaster management, Hazard, Risk , Vulnerable groups

DM 1.3. History of involvement of Physiotherapists in rehabilitation efforts during emergencies

DM 1.4. National organisations who are involved in disaster preparedness and management strategies:

1. The legal framework for disaster management in India: Key takeaways of Disaster Management Act 2005, National Policy on Disaster Management 2009 and National Disaster Management Plan 2018
2. Different types of disasters managed in India, Epidemiologic surveillance and disease control, main goal of the National Disaster Management Authority, areas in India are most prone to disasters, Institutional structure for disaster management in India at various levels, Central Ministry that coordinates disaster management and leader of NDMA in India
3. Disaster Management Act of 2005 key take aways and its significance, Phases of Disaster management, Long term prevention measures, role of various stake holders in disaster management, role of community involvement in disaster management, challenges faced in disaster management in India
4. Prime minister's 10 point agenda and Community based and Technology driven approaches: Key policies and strategies

DM 1.5. International organisations who facilitate contributions of physiotherapists in disaster preparedness and management strategies. Role of physiotherapists in:

1. Disaster management within their own countries, benefits of rehabilitation provided following disasters
2. Prevention of a disaster
3. Preparedness for disaster with respect to essential locally appropriate preparedness for a disaster,
4. Identifying and connecting professional associations, health service providers and training institutions.
5. Developing international humanitarian response
6. Response to disaster: Required skills and knowledge and required actions and secure resources with respect to assessment, coordination, psycho-social support and advocacy
7. Recovery: with respect to planning of medical management and local capacity building and physiotherapy rehabilitation, advocacy

DM 1.6. The type and distribution of injuries caused by disasters, the type of hazards, common injuries that can lead to long-lasting or permanent disability.

DM 1.7. Clinical Practice in Response phase along with documentation (conservative and surgical), record management, data and research, informed consent and confidentiality, regulations and scope of practice, hand hygiene and infection control, communication, referral, discharge planning with respect to international management strategies.

DM 1.8. International Disaster Management Rehabilitation Response Plans and role of Physiotherapists with respect to: Systems in Place, Identifying Personnel, Facilities and Resources, Advocacy and Partnerships, Training and Capacity Building

DM 1.9. Elements to be considered "essential" components in any disaster education or training programme for health professionals as defined by Global Response Framework,

DM 1.10. The World Health Organization (WHO) : the lead UN agency in the health cluster and its emergency response framework and Humanitarian principles

Recommended websites for references: Disaster management

National Disaster Management Plan, 2016. A publication of the National Disaster Management Authority, Government of India. May 2016, New Delhi at www.mha.gov.in

www.wcpt.org/disaster-management.

5.20.7. **Exercise Physiology**

Details presented on next page

5.20.8. **Dissertation:**

Each candidate will have to carry out of a dissertation on Speciality related subject of MPT. Ethical approval certificate from **Registered Institutional Ethical committee** and Clinical Trial Registration is mandatory for intervetional Dissertation study topic. The dissertation to be guided by Guide of the speciality of faculty of physiotherapy of the department under whom the student is persuing MPT. 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.

5.20.9. **Practical / clinical examination**

Compulsary rotatory Clinical Posting as per the Speciality and Clinical Assessment during Clinical posting is mandatory .

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2ND YEAR M.P.T

5.20.7. COURSE CODE -M.P.T-201

COURSE TITLE -EXERCISE PHYSIOLOGY (EP) Theory (L) Practical (P)

EP 1.0. Subject description Course outcomes

1. 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
2. CO2: Appreciate the measurement of energy cost of exercise and importance of energy transfer and energy expenditure at rest and during various physical activities
3. 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.
4. CO4: Acquire about importance of diet for various competitions, nutrient supplements for performance and to design caloric requirements for various sports and age groups.
5. 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.
6. 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

EP 1.1. **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:

EP 1.2. 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

EP 1.3. **Nutrition metabolism** of Carbohydrate, fats, proteins, vitamin, mineral and water

EP 1.4. **Nutrition in exercise** optimum nutrition for exercise, nutrition for physical performance, pre game meal carbohydrate loading, food for various athletic events, fluid and energy replacement in prolonged exercise

EP 1.5. **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.

EP 1.6. **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

EP 1.7. **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.

EP 1.8. **Hormonal responses to exercise with respect to** Growth Hormone (GH), Thyroid and Parathyroid Hormones. Antidiuretic Hormone (ADH) and Aldosterone, Insulin and Glucagons, The catecholamine; epinephrine and norepinephrine. The sex hormones. The glucocorticoids (Cortisol) and Adreno Corticotropic Hormones (ACTH). Prostaglandins and Endorphins.

SECTION -B

EP 2.1. **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

EP 2.2. **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

EP 2.3. **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

EP 2.4. 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

EP 2.5. 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

EP 2.6. 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.

EP 2.7. 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

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Books suggested for EP

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

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5.21. Specialty papers

COURSE CODE -M.P.T-104, M.P.T 202, & M.P.T-203

1) Master of Physiotherapy in Musculoskeletal Sciences

MPT (MS)104: Clinical, Physical and Functional diagnosis in Musculoskeletal Physiotherapy

MPT (MS) 202: Musculoskeletal Physiotherapy

MPT (MS) 203: Recent advances in Musculoskeletal Physiotherapy

COURSE CODE-M.P.T (MS)-104

COURSE TITLE **Clinical, Physical and Functional diagnosis in Musculoskeletal physiotherapy (MCPFD)**

MCPFD 1.0. Subject description

MCPFD 1.0.1. 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.
    a) Cardiac efficiency tests and spirometry
    b) Fitness test for sports
    c) Physical disability evaluation and disability diagnosis. Gait analysis and diagnosis.
    d) Coping Strategies in chronic painful musculoskeletal conditions. Checkouts of orthotics and prosthetics for neuro-musculoskeletal problems. Effect of Immobilization on Musculoskeletal System
    e) Application of ICF in Musculoskeletal diagnosis
    f) Medical screening for potential referred pain and Red Flags

Course Content: M.P.T (MS)-104

Part I

MCPFD 1.1. Clinical Decision Making - Planning Effective Treatment. Clinical decision making models, Team approach, Foundation for clinical decision making.

MCPFD 1.2. Vital Signs. Identification of reasons for monitoring vital signs; importance of monitoring vital signs; common techniques of monitoring vital signs; identification and analysis of normal values with that of abnormal values.

MCPFD 1.3. Principles and application of investigative and imaging techniques in Physiotherapy

a. Blood test

b. Arterial Blood Gas (ABG) analysis

c. Pulmonary Function Test (PFT)

d. Radiological examination

e. Computerized Tomography (CT)

f. Magnetic Resonance Imaging (MRI)

g. Ultrasonography (US)

h. Electrocardiography (ECG)

i. Dope testing

MCPFD 1.4. Evaluation assessment and treatment planning strategies for musculoskeletal, neurological, cardiopulmonary, sports specific and other physiotherapy conditions: Principles of evaluation, clinical manifestations, general and specific clinical examination.

i. Physiotherapy assessment of the following:

a. Range of motion (ROM)

b. Tone

c. Muscular strength and endurance

d. Flexibility

e. Coordination - Non equilibrium test - Equilibrium test

f. Sports specific skills

g. Cardiac efficiency

h. Sensory evaluation

i. Functional Evaluation - Various scoring methods in functional assessment - Validity and reliability

j. Fitness evaluation - Aerobic - Anaerobic

k. Spasm

l. Trigger Point

m. Tender Point

n. Spasm

ii. Assessment of cognitive, perceptual dysfunctions and vestibular dysfunction.

MCPFD 1.5. Electro-Diagnosis:

i. Characteristics and components of Electro therapeutic stimulation systems and Electro physiological assessment devices.

ii. Instrumentation for neuromuscular electrical stimulation.

iii. Electrical properties of muscle and nerve.

iv. Neurobiology of afferent pain transmission and central nervous system mechanisms of pain modulation.

v. Electrical stimulation and circulation.

MCPFD 1.6. Clinical Electro physiological testing: Instruments, Techniques and Interpretations of

a. Nerve conduction velocity including Repetitive Nerve Stimulation (RNS)

b. Electromyography

c. Bio-feedback technique.

d. Late responses

MCPFD 1.7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.

MCPFD 1.8. Evoked potentials – VEP, SSEP, MEP, BAEP

Part II

MCPFD 2.1. Psychological aspects of rehabilitation in disability: Psychological tests.

MCPFD 2.2. Developmental Screening

i. Factors Motor control assessment

ii. Motor control theories/mechanism

iii. Patterns of normal development

iv. specific procedures and tests used to assess motor control defects

MCPFD 2.3. Anthropometry

1. Body measurements - Height - Weight - Circumference
2. Body Proportion - Body Mass Index (BMI) - Waist Hip Ratio (WHR)

3. Body Composition

    i. Somatotyping

    ii. Methods of measurement

        a. Water displacement method for body fat.

        b. Skin fold measurement

        c. Under water weighing

        d. Bioelectric Impedance Analysis (BIA)

MCPFD 2.4. Differential diagnosis in Physiotherapy

MCPFD 2.5.

i. Functional evaluation.

a. The concepts of health status impairment; functional limitations;
b. Disability and Persons with Disabilities;
c. Definition of functional activity and the purposes and components of the functional assessment;
d. Selection of activity and roles for an individual based on his or her capabilities and functional limitations.

ii. Various forms of functional tests;

a. Physical function test
b. Multi-dimensional functional assessment instrument,
c. Identification of instrument for testing function.

iii. Various scoring methods used in functional assessment;

iv. Reliability and validity of various functional assessments.

MCPFD 2.6. Evaluation of aging

SPECIALITY PAPER 2 COURSE CODE-202

COURSE CODE-M.P.T (MS)-202

COURSE TITLE **Musculoskeletal physiotherapy (MSK)**

MSK 1.0. Subject description

MSK 1.0.1. 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

SECTION -A

MSK 1.1. Advanced instruction in treatment and follow-up of the musculoskeletal system

MSK 1.2. Upper Quarter and Lower Quarter Muscle imbalances leading to dysfunction with corrective measures Exercise planning and Exercise Prescription for musculoskeletal conditions

MSK 1.3. Management of pathological gaits and Postural deviations

MSK 1.4. Orthopaedic implants - designs, materials indications, post – operative Physiotherapy

MSK 1.5. Manual therapy – Principles, indications, contraindications, and methods of application of joint mobilization techniques and soft tissue manipulations Cumulative Traumatic Disorders and management

MSK 1.6. Aids and appliances, adaptive functional devices to improve neuro-musculoskeletal dysfunctions Physiotherapy management of locomotor impairments, and disabilities at institutional & community levels

MSK 1.7. Taping techniques in orthopedic conditions Sports injuries and their management

SECTION- B

MSK 2.1. 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

MSK 2.2. Pre and Post surgical Rehabilitation of Joint replacement surgeries

MSK 2.3. Physiotherapy management after tendon transfer, Electrical stimulation and biofeedback procedures Assessment and management of Paediatric and geriatric musculoskeletal disorders

MSK 2.4. Physical Agents and Electrotherapeutic management in orthopedic conditions. Rehabilitation of congenital conditions and malformation of musculoskeletal disorders. Physiotherapy management in Amputation and Prosthetic Prescription.

MSK 2.5. Equipment in orthopedic Physiotherapy such as: Isokinetic, EMG and Biofeedback, Proprioception assessment equipments, Gait analyzers. Home and self-help programme in orthopedic Physiotherapy.

MSK 2.6. Disability prevention and management

SPECIALITY PAPER 3

COURSE CODE-M.P.T (MS) 203

Course Title: Recent advances and Evidence Based Practice in Musculoskeletal Physiotherapy (MRAEB)

MRAEB 1.0. Subject description

MRAEB 1.0.1. **Course outcome**

Students will be able to:

1. Understand and apply the information regarding recent advances in Orthopedic Manual Therapy for patient care.
2. Search the evidences available for assessment and management of orthopedic conditions.
3. Apply the evidences available for the management of various orthopedic conditions.

SECTION A:

MRAEB 1.1. Manual therapy: soft tissue manipulations and mobilization, neural mobilization, acupressure.(Cyriax, Maitland, Butler, McKenzie, Kaltenborn, Mulligan)

MRAEB 1.2. EBP and Recent advances in clinical assessment, laboratory investigations and diagnosis of musculoskeletal disorders. EBP in Management of pain in musculoskeletal disorders.

MRAEB 1.3. Recent Advances in management of orthopedic conditions- medical, surgical and Physiotherapy Recent Advances in Physiotherapy management in arthritis and allied conditions.

MRAEB 1.4. Recent Advances and Controversies in Electrotherapy for orthopedic conditions.

MRAEB 1.5. Assessment and training for Core, postural stability and balance in musculoskeletal conditions Recent advances in Kinematic & kinetic analysis.

MRAEB 1.6. Use of advance Assistive devices and technologies in musculoskeletal system Current trends in sports injuries and management.

MRAEB 1.7. Evidence Based Physiotherapy in management of metabolic and hormonal, neoplastic and infective conditions of bones and joints.

SECTION-B

MRAEB 2.1. Recent Advances in Physiotherapy following arthroplasty, implants and soft tissue repairs.

MRAEB 2.2. 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.

MRAEB 2.3. 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.

MRAEB 2.4. Community based rehabilitation in musculoskeletal disorders. Recent Advances and Controversies in Orthopaedic physiotherapy. Ergonomics assessment and management at work place.

MRAEB 2.5. 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.JanesGrosenbach - Basic Science for soft tissue and movement therapies.
6. Jean Sayne Adams, Steve Wright - Theory and practice of therapeutic touch.
7. AkhouryGourang 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 D4o4r5land, 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).

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2) Master of Physiotherapy in NeuroSciences

SPECIALITY PAPER ONE

COURSE CODE-MPT-104

1. **MPT(N) 104: Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)**
2. **MPT (N) 202: Neurological Physiotherapy (NPT)**
3. **MPT (N) 203: Recent advances and Evidence Based Practice in Neuro-Physiotherapy (NRAEB)**

Course Title: MPT(N) 104: **Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy** (NCPFD)

NCPFD 1.0. Course description

NCPFD 1.0.1. 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

NCPFD 1.1. ICF conceptual frame work

NCPFD 1.2. Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

NCPFD 1.3. Need and types of Documentation

NCPFD 1.4. Critical decision making and selection of outcome measures in Musculoskeletal Physiotherapy

NCPFD 1.5. Assessment, differential diagnosis and diagnosis of various Neurology conditions

NCPFD 1.6. Associated functional disturbances of higher function and their testing

NCPFD 1.7. Outcome measures used in Neuro-physiotherapy-for Cognitive impairment and disability, Focal disabilities, Global measures of disability, Motor impairment, ADL and extended ADL tests, Person with Disabilities and quality of life, Multiple Sclerosis, Parkinson's disease, Stroke, Head injury, Spinal cord injury, Pain scales

NCPFD 1.8. Clinical analysis of posture, movement and gait, use of gait analyzer

NCPFD 1.9. 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.

NCPFD 1.10. Clinical examination and detection of movement dysfunction

NCPFD 1.11. Evaluation of ANS dysfunction with reference to Psycho physiological testing

NCPFD 1.12. Motor control assessment, reflexes and automatic reactions

NCPFD 1.13. Neurodevelopment assessment

SECTION- B

NCPFD 2.1. Assessment of Hand Function

NCPFD 2.2. Voluntary control assessment

NCPFD 2.3. Neuropsychological tests

NCPFD 2.4. Electrophysiological assessment devices – Instrumentation, Characteristics and components EMG (Qualitative and Quantitative EMG), NCV, Conventional Methods, RNS, EPS, EEG related to neurological disorders with interpretation.

NCPFD 2.5. Physical disability evaluation and disability diagnosis

NCPFD 2.6. Assessment of progressive locomotor disorder- Neuropathic, myopathic and NMJ conditions

NCPFD 2.7. Assessment and scales for diagnosis of pain

NCPFD 2.8. Biomarkers specific to neurological disorders

NCPFD 2.9. Assessment of Emotional Intelligence

NCPFD 2.10. Assessment of Peripheral nerve injuries and Cranial nerve disorders.

NCPFD 2.11. Neurophysiology and evaluation of Balance and Coordination

NCPFD 2.12. Assessment of Physical and Neurological Functions of Patients in ICU.

SPECIALITY PAPER TWO COURSE CODE: MPT (N)-202

MPT (N) 202: **Neurological Physiotherapy** (NPT)

NPT 1.0. Course Description

NPT 1.0.1. Course outcome

1. Develop a management plan, generally including some lifestyle factors, in cooperation 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

NPT 1.1. History of neurological Physiotherapy, Epidemiology, classification of Neurology disorders, ICF classification of Neurological Disorders, symptomatology, patho-physiology and management of Neurological Disorders.

NPT 1.2. Physiotherapy interventions of various disorders of Central Motor control

NPT 1.3. Physiotherapy interventions of various disorders of the Motor Unit – Neuropathies, Myopathies and Neuromuscular Junction Disorders.

NPT 1.4. Physiotherapy interventions for Autonomic Nervous system dysfunction

NPT 1.5. Physiotherapy intervention for Peripheral Nervous system conditions (injuries and lesions)

NPT 1.6. Physiotherapy interventions for Tonal abnormalities.

NPT 1.7. Physiotherapy intervention for Traumatic conditions of CNS

NPT 1.8. Physiotherapy management for Demyelinating, Inflammatory, Infectious and Degenerative conditions.

NPT 1.9. Physiotherapy management for CNS Neoplasia.

NPT 1.10. Metabolic and Deficiency Disorders and their management

NPT 1.11. Congenital Neurological Disorders and management

NPT 1.12. Disorders of Perception & Cognition & their Rehabilitation,

NPT 1.13. Sensory System Dysfunction and rehabilitation

NPT 1.14. Oromotor Dysfunctions and Management

NPT 1.15. Visual Deficits and its management.

SECTION- B

NPT 2.1. Vestibular Dysfunction and its rehabilitation

NPT 2.2. Psychosomatic conditions and management.

NPT 2.3. Neuro - Surgical conditions and its postoperative management.

NPT 2.4. Neuro-Physiotherapy management in Intensive Care Units (ICU).

NPT 2.5. Physiotherapy interventions for muscle imbalances and corrective measures. Musculo-skeletal and Neurological complications of Locomotor Disorders

NPT 2.6. Pain Management

NPT 2.7. Adaptive and Assistive Functional Devices and technologies to improve neurological dysfunction.

NPT 2.8. Management of Bladder and Bowel Dysfunction

NPT 2.9. 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.

NPT 2.10. FES, NMES, Biofeedback, Various equipment used in Neuro-physiotherapy

NPT 2.11. Problem Based Learning clinical conditions in Neurology physiotherapy.

NPT 2.12. Pharmacology in Neurophysiotherapy.

NPT 2.13. Training of Emotional Intelligence.

NPT 2.14. Hydrotherapy for Neurological conditions.

NPT 2.15. Palliative Care Approach.

NPT 2.16. Physiotherapy Management of Cerebellar Disorders.

SPECIALITY PAPER -THREE COURSE CODE: MPT (N)-203

MPT (N) 203: **Recent advances and Evidence Based Practice in Neuro-Physiotherapy** (NRAEB)

NRAEB 1.0.1. Course outcome

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

NRAEB 1.1. Basics of Genetic counseling, Stem cell therapy, Gene therapy

NRAEB 1.2. Recent advances in Pain Modulation and Rehabilitation.

NRAEB 1.3. Recent advances in Vocational Rehabilitation in Neurology Disorders with disability

NRAEB 1.4. Recent advancement in Neurology Orthosis – prescription and training.

NRAEB 1.5. Psychiatry problems in Neurological conditions and Physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of neurological disabilities

NRAEB 1.6. Institutional & community-based rehabilitation for Neurological Dysfunction**.**

NRAEB 1.7. 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, CranioSacral 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

NRAEB 1.8. Eclectic Approach.

SECTION- B

NRAEB 2.1. 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.

NRAEB 2.2. Evidences in interventions for Neurological Impairments (Sensory, Motor, Cognitive and Perceptual)

NRAEB 2.3. Evidences for Physiotherapy in Traumatic CNS conditions

NRAEB 2.4. Evidences in Physiotherapy management of Stroke, Cerebellar Ataxia.

NRAEB 2.5. Evidences in Physiotherapy management of Peripheral Nerve Injuries

NRAEB 2.6. Evidences in Physiotherapy management of Parkinson's Disease

NRAEB 2.7. Evidences in Physiotherapy management of Myopathies, Neuropathies and NMJ Disorders

NRAEB 2.8. Sports training in Neurological Physiotherapy.

NRAEB 2.9. Tele rehabilitation in Neurological Physiotherapy

Books for Masters in Neurosciences

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 Healthcare 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. Chrchhill 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, Londo -
28. Bobath B: Abnormal postural reflex activity caused by Brain Lesions. Aspen publications, Rockville
29. Eagel: Disord4e5r5s 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 Gunzbng, 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, Mcarthur public, 3rd edition.

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3) Master of Physiotherapy in Cardio- Pulmonary Sciences

MPT (C) 104: Clinical, Physical and Functional diagnosis in Cardio- Pulmonary Physiotherapy (CCPFD)

MPT (C) 202: Cardio- Pulmonary Physiotherapy (CPT)

MPT (C) 203: Recent advances and Evidence Based practice in Cardio- Pulmonary Physiotherapy (CRAEB)

SPECIALITY PAPER ONE COURSE CODE: MPT (C)-104

Course Title: Clinical, Physical and Functional diagnosis in Cardio- Pulmonary Physiotherapy (CCPFD)

CCPFD 1.0.1. Course outcome

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

CCPFD 1.1. ICF conceptual frame work

CCPFD 1.2. Importance of assessment & evaluation, Outlines of principles and Methods of evaluation Need and types of Documentation

CCPFD 1.3. Critical decision making and selection of outcome measures in cardiopulmonary Physiotherapy

CCPFD 1.4. GENERAL: Review of Anatomy, Embryology and Epidemiology of cardio-vascular, pulmonary and lymphatic pulmonary system.

CCPFD 1.5. Role of cardio respiratory therapist in patient assessment.

1. Patient clinician interaction and communication with assessment findings.
2. Confidentiality, concern and universal precautions.
3. A detailed and comprehensive cardio-respiratory health history.
4. Assessment standards, common scales, questionnaire indices used for patients with cardio-pulmonary dysfunction.

CCPFD 1.6. **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.

CCPFD 1.7. **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

CCPFD 1.8. **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

CCPFD 1.9. **Assessment of neonatal and pediatrics patients – new born, critically ill infants, older infants and child**

CCPFD 1.10. **Comprehensive geriatric assessment – age related sensory deficits, cardio-respiratory deficits and diagnostic tests, standard scales and questionnaires used in geriatric assessment**

CCPFD 1.11. **Nutritional assessment of patients with cardio- respiratory diseases**

CCPFD 1.12. **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

CCPFD 1.13. **Exercise testing and standardization and interpretation**

1. TMT protocols- Maximal and submaximal protocols
2. Field protocols
3. Bicycle protocols
4. Step test protocols
5. Six minute walk test
6. Protocols for pediatric and geriatric population

CCPFD 1.14. **Interpretation and clinical relevance of investigations in cardio- pulmonary Physiotherapy**

1. Clinical laboratory studies – hematology, microbiology, urine analysis, histology, pathology
2. Pulmonary function tests – normal values
3. Spirometry, arterial blood gas analysis and its interpretation in cardio – respiratory Physiotherapy, capnography and pulse oximetry and its relevance in cardio- pulmonary Physiotherapy
4. 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
5. Laboratory and bedside interpretation of ECG findings – interpretation of normal and abnormal ECGs and its importance in cardio-respiratory physio-therapy and various ECG patterns in cardiac and lung disease
6. Cardio respiratory monitoring in critically ill patients including patients with artificial airways
    i. Ventilator assessment and evaluation of oxygenation in ICU
    ii. Assessment of cardiac output in ICU
    iii. Assessment of haemodynamic pressures in ICU
    iv. Clinical diagnosis in cardio- respiratory disorders in intensive care.

SECTION- B

CCPFD 2.1. Blood flow studies-arteriography, venography, Color Doppler, ANS testing and interpretation used in cardio- respiratory Physiotherapy and edema evaluation and interpretation.

CCPFD 2.2. Cardio respiratory assessment and diagnosis of patient on mechanical ventilator and interpretation of graphical forms, weaning modes and indices

CCPFD 2.3. Risk factor stratification, disability evaluation with reference to cardio vascular and pulmonary disorders

CCPFD 2.4. Psychological evaluation with reference to stress and anxiety in cardio- pulmonary disorders, Evaluation of stress and anxiety using various scales and questionnaires

CCPFD 2.5. Outcome measures used in Cardio – vascular and pulmonary Physiotherapy

CCPFD 2.6. Cardio-pulmonary Exercise Testing, VO2 max, METs – its importance in calculating energy expenditure and physical activities

CCPFD 2.7. Calculating energy expenditure using calorimetry method, various formulae and equations with emphasis on its importance in prescribing exercise in various patient population

CCPFD 2.8. Evaluation and diagnosis of sleep and breathing disorders.

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SPECIALITY PAPER TWO

COURSE CODE: MPT (C)-202

Course Title: MPT (C) 202: Cardio and pulmonary Physiotherapy (CPT)

CPT 1.0.1. Course Outcomes:

1. Develop a management plan, generally including some lifestyle factors, incorporation 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

CPT 1.1. Principles of exercise prescription and exercise program adherence.

CPT 1.2. Components of physical fitness and Basic principles of exercise program design.

CPT 1.3. The art of science of exercise prescription in various patient population

CPT 1.4. Bioenergetics of exercise and training

CPT 1.5. Warm ups, stretching and cool down and its importance

CPT 1.6. Exercise program adherence and factors affecting exercise adherence.

CPT 1.7. Different forms of training methods.

CPT 1.8. 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.

CPT 1.9. Designing Resistance exercise programs.

1. Types of resistance training and developing respiratory exercise program including calisthenics.
2. Resistance exercise program for children and older adults.

CPT 1.10. Designing flexibility and stretching programs.

CPT 1.11. Designing weight management (weight loss and weight gain) and

CPT 1.12. Application of exercise prescription principles in various cardio-pulmonary disorders including edema management

SECTION- B

CPT 2.1. Nutrition and cardio-vascular and pulmonary diseases including diabetic population- Role of carbohydrates, proteins, fats, vitamins in health and disease.

CPT 2.2. Diet prescription in diabetic, hypertensive, cardio-metabolic syndromes, obesity and cancer patients according to calorie expenditure.

CPT 2.3. Exercise prescription/ physical activity in a high risk cardiac patient including L.V Dysfunction, chronic heart failure, myocardial ischemia.

CPT 2.4. Exercise prescription in prevention of CAD, obesity, renal dysfunction, diabetes mellitus, hypertension.

CPT 2.5. Cardio-vascular disorders and physiotherapy management including exercise prescription in:

i. Myocardial infarction
ii. Acquired heart conditions
iii. Hypertension, hypotension
iv. Rheumatic fever, rheumatic heart disease and non- rheumatic valvular diseases.
v. Diseases of myocardium, pericardial diseases, cardiomyopathies
vi. Vascular diseases, peripheral vascular diseases and lymphatic diseases
vii. Tumors of heart
viii. Athlete heart
ix. Congestive cardiac failure
x. Cardiac arrhythmias
xi. Congenital heart diseases
xii. Cardiac transplantation

SECTION- C

CPT 3.1. PULMONARY DISORDERS AND PHYSIOTHERAPY MANAGEMENT INCLUDING EXERCISE PRESCRIPTION IN:

i. Obstructive pulmonary diseases
ii. Restrictive pulmonary diseases
iii. Infective lung diseases
iv. Occupational lung diseases
v. Lung cancer

vi. Chest wall deformities and spinal cord injury

vii. Diaphragmatic diseases

viii. Sleep apnea/ hyperventilation syndrome

ix. Respiratory disorders in children, cystic fibrosis

x. COVID-19

CPT 3.2. Common emergency conditions in cardio-respiratory system in adults and children and ethical issues in intensive care

CPT 3.3. Management of Pediatric and geriatric Cardiac and pulmonary disorders

CPT 3.4. Burns rehabilitation in Critical Care unit

CPT 3.5. 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.

CPT 3.6. Physical agents used in various cardio-vascular and respiratory disorders

CPT 3.7. Cardio-vascular and pulmonary pharmacology- Indications, contraindications and effects and pharmacological management in cardiac and pulmonary disorders.

CPT 3.8. Body positioning: art and its physiological importance in general and in ICUs

CPT 3.9. Aerosol therapy- Principles and its role in physiotherapy.

CPT 3.10. Humidifiers and Atomizers role in physiotherapy.

CPT 3.11. 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.

CPT 3.12. Importance of Patient education and counseling in various cardio-vascular and pulmonary disorders in cardio- respiratory conditions, CBR in cardio vascular and respiratory conditions.

CPT 3.13. Role of Tele-rehabilitation in cardiac and pulmonary disorders.

CPT 3.14. Clinical decision making in Cardiovascular and pulmonary physiotherapy.

SPECIALITY PAPER THREE

COURSE CODE: MPT (C)-203

MPT (C) 203: Recent advances and Evidence Based Practice in Cardio and pulmonary Physiotherapy (CRAEB)

CRAEB 1.0.1. Course Outcome

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

CRAEB 1.1. GENERAL:

i. Optimizing treatment prescription: relating treatment to the underlying pathophysiology of cardio-vascular and pulmonary disorders- an evidence-based practice

ii. Documentation of the data, Report writing –prescription of exercises

iii. Importance of creating awareness in community, Patient education and psychological counseling in various cardio-vascular and pulmonary disorders evidence-based practice

iv. Recent advancement in Cardio- pulmonary resuscitation (basic and advanced)

CRAEB 1.2. Bronchial hygiene- Physiological basis and clinical application, evidence-based practice and recent advances of airway clearance techniques, including Facilitating airway clearance with coughing techniques.

CRAEB 1.3. Care of a dying patient. – Ethical issues and recent guidelines

CRAEB 1.4. Cardiopulmonary training in various patient populations. Athletes, Geriatric and pediatric population

CRAEB 1.5. 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.

CRAEB 1.6. Aerosol therapy**-** An Evidence based practice in chest physiotherapy.

SECTION- B

CRAEB 2.1. Recent advances and evidence-based practice in Exercise testing, planning, principles of exercise prescription and PT management in cardio- vascular and pulmonary conditions.

CRAEB 2.2. 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.

CRAEB 2.3. Recent advances in the use of physical agents and PT management in wounds, ulcers, grafts and incisions and vascular disorders.

CRAEB 2.4. Evidence based practice of core muscle strengthening, resistance training, endurance training, and other training methods in cardiac and pulmonary rehabilitation

CRAEB 2.5. Pilates- school of thought for cardiopulmonary conditions.

CRAEB 2.6. Physiotherapy management in oncology- Evidence based practice and recent advances.

CRAEB 2.7. Recent advances and evidence-based practice in Respiratory Physiotherapy training techniques and respiratory Physiotherapy devices.

CRAEB 2.8. Evidence based practice and recent advances in improving Cardio-respiratory fitness training in all populations including general, pediatric and geriatric population.

CRAEB 2.9. Evidence based practice and Recent guidelines in cardiac rehabilitation and pulmonary rehabilitation

CRAEB 2.10. Role of exercise and quality of life and cardio-pulmonary rehabilitation, health status measurements and recent advances

CRAEB 2.11. Use of advance Assistive devices like Robot therapy, continuous lateral rotation therapy, intrapulmonary percussive ventilator and technologies in Cardiovascular and pulmonary system.

CRAEB 2.12. Evidence based practice and recent advances of Aquatic therapy in Cardiovascular conditions like diabetes, PVD, hypertension etc.

BOOKS for Physiotherapy in Cardio Pulmonary Sciences:

1) Froelicher /Myers- “Exercise and heart’ Saunders publication.
2) Jean Jobin et al. Advances in Cardio-Pulmonary Rehabilitation”
3) Scot Irvin, Lan Stephen Tecklin- “Cardio-Pulmonary physical therapy-a guide to practice”, Mosby.
4) Frances J Brannon, Margaret W Foley, Julie Ann Stars, Lauren M Saul
5) “Cardio-Pulmonary Rehabilitation-Basic Theory and Application”, F A Davis Company.
6) Cynthia Coffin Zadai- “Pulmonary management in Physical therapy”, Churchill Livingstone.
7) Barbara A Webber and Jennifer A Pryor- “Physiotherapy for respiratory and cardiac problems”, Churchill Livingstone.
8) George G. Burton, John E Hodgin, Jeffrey J Ward- “Respiratory Care-A Guide to Clinical Practice” 4th edition, Lippincott Williams and Wilkins,
9) Robert MBerne, Matthew N Levy- “Cardio-vascular physiology”, Mosby.
10) John B. West- “Respiratory Physiology-the essentials”, Lippincott Williams and Wilkins.
11) Macleod’s Clinical Examination.
12) Andrews Davies and Carl Moores- “The Respiratory System”, illustrated by Robert Britton, Churchill Livingstone.
13) George G. Burton, John E Hodgin, Jeffrey J Ward- “Respiratory Care-A Guide to Clinical Practice”, Lippincott Williams and Wilkins,
14) Richard d Branson/Robert L Chatburn- “Respiratory Care Equipment”, J B Lippincott Company.
15) N R Malentyre/R D Branson- “Mechanical Ventilation”, Saunders.
16) Joanne Watchie- “Cardio-Pulmonary Physical Therapy”, Saunders.
17) Hillegass and Sadowsky. “Essentials of Cardio-Pulmonary Physical Therapy”, Saunders, Elsevier.
18) Michael L. Pollock and Donald H Schmidt- “Heart disease and Rehabilitation”.
19) Scot Irvin, Lan Stiphen Tecklin. “Cardio-Pulmonary physical therapy-a guide to practice”, Mosby.
20) Frances J Brannon, Margaret W Foley, Julie Ann Stars, Lauren M Saul
21) Cardio-Pulmonary Rehabilitation-Basic Theory and Application”. F A Davis Company

4) Master of Physiotherapy in Sports Sciences

MPT (S) 104: Sports traumatology (STT)

MPT (S) 202: Concepts in sports medicine (SSM)

MPT (S) 203: Recent advances and Evidence Based practice in Sports Physiotherapy (SRAEB)

SPECIALITY PAPER - ONE COURSE CODE: MPT (S)-1O4

Course Title: MPT (S) 104: **SPORTS TRAUMATOLOGY (STT)**

SECTION- A

STT 1.1. ICF conceptual frame work

1. Importance of assessment & evaluation, Outlines of principles and Methods of evaluation Need and types of Documentation
2. Critical decision making and selection of outcome measures in SPORTS Physiotherapy
3. 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)
4. Principles of pathological investigations and imaging techniques related to musculoskeletal disorders with interpretation Causes & Mechanism of Sports Injuries

STT 1.2. Evaluaton Of Risk Factors And Pre-Participation Examination:

1. Components of pre-participation evaluation, Scope and implementation of pre-participation program in Sports PT
2. Evaluation of Physical Fitness: Assessment of components of physical fitness including functional tests: muscle strength, flexibility, agility, balance, co-ordination, sensory deficits, cardio-pulmonary endurance
3. Sports-Specific evaluation and criteria for return to sport
4. Examination of lower limb
    i. Pelvis
    ii. Hip
    iii. Thigh
    iv. Knee
    v. Leg
    vi. Ankle and Foot

5. Examination of Upper Extremity

   i. Shoulder girdle

   ii. Shoulder

   iii. Arm

   iv. Elbow &Forearm

   v. Wrist and hand.

6. Assessment of vertebral column:

   i. Cervical

   ii. Thoracic

   iii. Lumbosacral including Tests of Neural Tension

7. Sporting emergencies screening

   i. Head and neck

   ii. Face

   iii. Abdominal injuries

8. Anthropometric evaluation

9. Kinesiological EMG

SECTION- B

STT 2.1. Causes & Mechanism of Sports Injuries

STT 2.2. Prevention of Sports injuries

STT 2.3. Principle of management of sports injuries

STT 2.4. Common acute and overuse injuries, causation, prevention and management of lower Extremity in Sports PT

STT 2.5. Common acute and overuse injuries, causation, prevention and management of upper Extremity in Sports PT

STT 2.6. Common sports injuries of spine with respect to causation, prevention and management

STT 2.7. Sporting emergencies first aid

STT 2.8. Emergency Medical Planning and Cover for Sports Events

STT 2.9. Emergency Situations, Primary and secondary emergency assessment, emergency plan, Transportation of an injured person

STT 2.10. Treatment of collapsed athlete- Severe head injury, Athlete with spinal injury,

STT 2.11. Causes of Collapse

STT 2.12. Sports specific injuries, with special emphasis on the specific risk factor, nature of Sports,

STT 2.13. Biomechanical Analysis of Skills, kind of medical intervention anticipated and prevention with respect to various sporting events

i. Individual events: Field & Track
ii. Team events
iii. Contact and Non-contact sports
iv. Water sports

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SPECIALITY PAPER –TWO

COURSE CODE: MPT (S)-202

Course Title: MPT (S) 202: Concepts in sports medicine (SSM)

SECTION- A

Sports Training Parameters and Methods

SSM 1.1. Training Load, Adaptation and Recovery: Relationship of load and recovery, physiotherapeutic and psychological means of Recovery, Variables of Training:

Volume, Intensity, Density, Complexity.

SSM 1.2. Relationship between volume and intensity

SSM 1.3. Fatigue and overtraining: Diagnosis, Monitoring and preventing overtraining. RECOVERY METHODS

SSM 1.4. Training Methods: Interval training, Continuous training, Circuit training, Fartlek training, Weight training, Plyometric method, Cross training

SSM 1.5. Bio Motor Abilities and Program Design

SSM 1.6. Anaerobic Exercise Training & Prescription: Prerequisites, types and Factors affecting the training variables: Strength Development, Plyometric Training, Speed, Agility and Speed Endurance Development

SSM 1.7. Aerobic Exercise Training & Prescription: Prerequisites, types and Factors affecting the training variables

SSM 1.8. Coordination Training**:** Definition, Classification of coordinative abilities, factors affecting coordination and Methods to develop coordination

SSM 1.9. **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

i. Personality assessment and sports personality · Attention and perception in sports

ii. Concentration training in sports · Motivational orientation in sports

iii. 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

SSM 1.10. Para SPORTS

SSM 1.11. Sports Massage

SECTION- B

Non traumatic conditions of athletes

SSM 2.1. General Illness

SSM 2.2. Chronic/ non-communicable diseases

SSM 2.3. Exercise Induced Asthma

SSM 2.4. Anemia

SSM 2.5. Delayed onset muscle soreness (DOMS)

SSM 2.6. Runner's high & Exercise addiction

SSM 2.7. G.I.T. Diseases

SSM 2.8. Eating disorders in athletes

SSM 2.9. AIDS in sports people

SSM 2.10. **Sports for diseased**

1. Exercises and congestive heart failure
2. Exercise for Post coronary & bye pass patients
3. Exercise for diabetics
4. Diagnosis and management of skin conditions of Athletes:
    a. Bacterial infections
    b. Fungal Infections
    c. Viral infections
    d. Boils
    e. Cellulites.

SSM 2.11. **Female athlete problems**

i. Sports Amenorrhea.

ii. Injury to female reproductive tract.

iii. Menstrual Synchrony.

iv. Sex determination.

v. Exercise and pregnancy

SPECIALITY PAPER -THREE

COURSE CODE: MPT (S)-203

Course Title: Recent advances and evidence-based practice in Sports Physiotherapy (SRAEB)

SECTION A

SRAEB 1.1. Exercise and Common Pulmonary Conditions

i. Exercise induced bronchial obstruction

ii. Exercise in chronic airway obstruction

iii. Air pollution and exercise

SRAEB 1.2. Exercise and Cardiac Conditions

i. Exercise prescription for heart disease

ii. Exercise in primary prevention in ischemic heart disease

iii. Exercise for secondary prevention of ischemic heart disease

SRAEB 1.3. Diabetes and Exercise

i. Exercise in diabetic patients

ii. Exercise as a method of control of diabetes

SRAEB 1.4. Protective equipment design of shoe safety factors in equipment. Health club and fitness concept, use and misuse of equipment

SRAEB 1.5. Special concerns for para-athletes

SECTION B

SRAEB 2.1. Exercises for special categories

i. Child and adolescent athlete's problems (Exercise for growing bones)

ii. Special problems of older athletes

iii. Sports and exercise programme for geriatrics and rheumatic population

SRAEB 2.2. Doping in Sports

i. IOC prohibited drugs- groups and classifications

ii. IOC rules and regulations on doping in sports hazards of prohibited substances

SRAEB 2.3. Identification of talent for sports –

i. Detailed procedure for screening and identification of sports talent

ii. Prediction of adult potentials at the young age.

SRAEB 2.4. Sports Pharmacology and medico-legal issues in sports

SRAEB 2.5. Segmental Stabilization Concepts of spine

SRAEB 2.6. Emergency medical planning and cover for Sports events

SRAEB 2.7. Effect of physical activity intervention in youth

SRAEB 2.8. Precision heart rate training

SRAEB 2.9. Current concepts in obesity management XIII· Electromyography and Rehabilitation

SRAEB 2.10. Current concepts in comprehensive physical examination for the instabilities of knee

SRAEB 2.11. Current concepts in tendinopathies

BOOKS for Physiotherapy in Sports Medicine

1. Chew, F. (110107). Skeletal radiology: The bare bones (2nd ed.). Baltimore, MD: Williams & Wilkins.
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.
4. Mace, J. D., &Kowalczyk, N. (110104). Radiographic pathology for technologists (2nd ed.). St Louis, MO: Mosby.
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.
7. Nolte, J., & Angevine, Jr. J. B. (2000). The human brain in photographs and diagrams (2nd ed.). St Louis, MO: Mosby.
8. Wicke, L. (110107). Atlas of radiologic anatomy (6th ed.). Munich, Germany: Lea &Febiger.
9. Seidel, H. (110105). Mosby's guide to physical examination. St Louis, MO: C.V. Mosby.
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: Orthopeadic 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. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann.
23. Gait analysis – Perry J., Black Thorofare, New Jersy, 110102.
24. Mc Ardle, 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 - D4e7v4elopmental 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.
36. William E. Prentice: Rehabilitation Techniques - Mosby.
37. Werner Kuprian: Physical Therapy for Sports, W.B. Saunders.
38. Kennedy: Mosby's Sports Therapy Taping Guide.
39. Malone: Orthopeadic and Sports Physical Therapy, C.V. Mosby.
40. William E. Prentice: Therapeutic Modalities in Sports Medicine - Mosby.
41. William E. Prentice: Rehabilitation Techniques - Mosby.
42. O' Sullivan, Schmitz: Physical Rehabilitation – Assessment and Treatment - F.A. Davis.
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

59. James G. Hay – The Biomechanics of Sports Techniques, Prentice Hall. Brunnstrom - Clinical Kinesiology, F.A. Davis.

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.

63. White and Punjabi - Biomechanics of Spine - Lippincott.

64. Norkin&Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis.

65. Kapandji: Ph47y5siology of Joints Vol. I, II & III, W.B. Saunders.

66. Northrip et al: Analysis of Sports Motion: Anatomic and Biomechanic perspectives, W.C. Brown Co., IOWA.

67. Leveac B.F.: Basic Biomechanics in Sports and Orthopeadic Therapy, C.V. Mosby.

68. Morris B. Mellion: Office Sports Medicine, Hanley & Belfus.

69. Richard B. Birrer: Sports Medicine for the primary care Physician, CRC Press.

70. Torg, Welsh &Shephard: Current Therapy in Sports Medicine III - Mosby.

71. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
72. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
73. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
74. Gould: Orthopaedic Sports Physical Therapy, Mosby.
75. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann.
76. D. Kulund: The Injured Athlete, Lippincott.
77. Nicholas Hershman:
78. Vol. I The Upper Extremity in Sports Medicine.
79. Vol. II The Lower Extremity and Spine in Sports Medicine.
80. Vol. III The Lower Extremity and Spine in Sports Medicine. Mosby.
81. Lee & Dress: Orthopaedic Sports Medicine - W.B Saunders.
82. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams and Wilkins.
83. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
84. First Aid to Injured: St. John's Ambulance Association.
85. Andrea Bates and Norm Hanson: Aquatic Exercise Therapy, W.B. Saunders.
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.
90. Voss et al - Proprioceptive Neuromuscular Facilitation - Patterns & Techniques - Williams & Wilkins
91. Torg, Welsh andShephard: Current Therapy in Sports Medicine III - Mosby.
92. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
93. Nordinand Frankel: Basic Biomechanics of Muscular Skeletal System: Williams and Wilkins.
94. Mc Ardle, Katch, Katch: Exercise Physiology.
95. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
96. O'Leary: Drugs and Doping in sports.

97. Wilson, A. Effective management of musculoskeletal injury: A clinical ergonomics approach to prevention. Churchill Livingstone.

98. Lee and Dres4s7:6 Orthopaedic Sports Medicine - W.B Saunders

99. Kurt Dorr and Jonathan S. Rakich: *Hospital Organization and Management:*

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5) Master of Physiotherapy in Pediatrics and Neonatal Sciences:

MPT (P) 104: Clinical, physical & functional diagnosis in pediatric physiotherapy (PCPFD)

MPT (P) 202: Pediatric physiotherapy (PPT)

MPT (P) 203: Recent advances and Evidence Based practice in PEDIATRIC PHYSIOTHERAPY (PRAEB)

SPECIALITY PAPER -ONE

COURSE CODE: MPT (P)-104

Course Code: CLINICAL, PHYSICAL & FUNCTIONAL DIAGNOSIS IN PEDIATRIC & NEONATAL PHYSIOTHERAPY MPT (P) 104 (PCPFD)

PCPFD **1.0.1. 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 & in- terpret 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

PCPFD 1.1. Review of Embryology

PCPFD 1.2. Maturational, patho -physiological & recovery process in the CNS

PCPFD 1.3. Genetic basis of pediatrics disorders

PCPFD 1.4. Pain assessment in neonates & children

PCPFD 1.5. Patho-mechanics and clinical biomechanics of posture and movement in various Pediatric conditions

PCPFD 1.6. Analysis and diagnosis of functional mechanics and patho-mechanics of gait in children

PCPFD 1.7. 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

PCPFD 1.8. Clinical examination in general and physical and functional diagnosis for detection of movement dysfunction

PCPFD 1.9. 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)

PCPFD 1.10. Evaluation of typical and atypical development of children in various domains of development (Gross, fine, cognitive, speech & language, personal social and adaptive functions)

PCPFD 1.11. Evaluation, epidemiology, symptomatology and patho-physiology of common Pediatric congenital, cardio-respiratory, neurological and musculo-skeletal disorders

PCPFD 1.12. Clinical, physical and functional diagnosis of developmental disorders

PCPFD 1.13. Neurodevelopment assessment

PCPFD 1.14. Hand Function-Assessment and diagnosis

PCPFD 1.15. Theories of Motor control and Motor learning processes

PCPFD 1.16. Principles, administration and interpretation of Developmental screening tools

SECTION- B

PCPFD 2.1. Voluntary control assessment

PCPFD 2.2. Outcome measures used in Pediatric Physiotherapy

PCPFD 2.3. Pre and post- surgical physiotherapeutic (Physical and functional) evaluation for various surgical conditions in children

PCPFD 2.4. Anthropometrics measurements in children- Principles, methods, normal values for different ages, deviation and its clinical and functional significance

PCPFD 2.5. 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

PCPFD 2.6. Fitness evaluation in children for sports

PCPFD 2.7. Physical and functional assessment for Aids, appliances& adaptive devices in Pediatric disorders

PCPFD 2.8. Physical disability evaluation and disability diagnosis

PCPFD 2.9. Assessment of various pediatric medical and surgical conditions

SPECIALITY PAPER -TWO COURSE CODE: MPT(P) -202

MPT (P) 202: Pediatric & Neonatal physiotherapy (PPT)

PPT 1.0. Course outcomes

1. Demonstrate an understanding of dysfunctions affecting Pediatric musculoskeletal, neurological and cardio -respiratory system including their patho- physiology.
2. 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.
3. Demonstrate specific rehabilitation skills, principles of rehabilitation of Pediatric disorders.
4. Explain factors involved in effective management of patients and also justify the importance of preventive care in rehabilitation

SECTION- A

PPT 1.1. Genetic counseling

PPT 1.2. Physiotherapy management of growth and developmental disorders (gross motor, fine, speech & language, personal- social –adaptive

PPT 1.3. Therapeutic techniques used in Neuro- pediatric conditions- Handling & positioning techniques, NDT, Vojta, Roods, CIMT, Sensor-motor re-education, PNF, Peto, Temple Fay, Phelps

PPT 1.4. Adjunct therapies- Manipulation, mobilization, taping, MFR, Cranio-sacral therapy, Body suits, hydrotherapy, hippo-therapy

PPT 1.5. Pain control & management in children

PPT 1.6. Motor learning techniques

PPT 1.7. Sensory integration disorders and management

PPT 1.8. Management of perceptual and cognitive disorders

PPT 1.9. Play behavior & its clinical application in therapy

PPT 1.10. Integrated approach in management of Pediatric disorders

PPT 1.11. Neonatal care and early intervention for risk babies

PPT 1.12. Physiotherapy management for congenital loco-motor disorders including prosthetic and orthotic prescription

PPT 1.13. Pediatric disability management at institutional & community levels

PPT 1.14. Pre and Post-operative management of pediatric surgeries

PPT 1.15. Rehabilitation of common pediatric musculo-skeletal disorders

PPT 1.16. Management of progressive loco-motor disorders- Neuropathic and Myopathic conditions

SECTION- B

PPT 2.1. Management of learning disabilities, ADHD, Autism, Developmental coordination disorders and behavioral disorders

PPT 2.2. Physiotherapeutic management of A.D.L and functional activities

PPT 2.3. Sports training in pediatrics

PPT 2.4. Psychological and mental health problems in children

PPT 2.5. Management of Child abuse and its associated problems

PPT 2.6. Management of common congenital, neurological, musculo-skeletal and cardio-respiratory disorders

PPT 2.7. Vocational rehabilitation for pediatric disorders

PPT 2.8. Metabolic disorders and their management

PPT 2.9. Exercise prescription for pediatric disorders

PPT 2.10. Oromotor dysfunction in children

SPECIALITY PAPER THREE COURSE CODE: MPT (P)-203

MPT (P) 203: Recent advances and Evidence Based practice in PEDIATRIC &NEONATAL PHYSIOTHERAPY (PRAEB)

PRAEB 1.0.1. Course outcomes

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

PRAEB 1.1. Advanced instruction in physical examination, diagnosis, treatment and reassessment of the Pediatric neurological, musculoskeletal, cardio – respiratory system

PRAEB 1.2. Psychosocial affects in children and parents

PRAEB 1.3. Evidence based practice for exercise prescription for home program

PRAEB 1.4. Report writing for clinical cases & research

PRAEB 1.5. Recent advances in prescription, indications, assessment and training for orthosis, prosthesis and adaptive equipment in physically challenged children

PRAEB 1.6. EBP in Muscul4o81skeletal and Neurological loco-motor disorders in children

SECTION- B

PRAEB 2.1. Rationale of basic and advanced investigative procedures with differential diagnosis

PRAEB 2.2. EBP & recent advances on the role of Physical therapy in public and special schools-

PRAEB 2.3. Recent advances in exercise prescription for children

PRAEB 2.4. EBP for management of pediatric oncology & burns

PRAEB 2.5. Recent advances in Pain control, assessment & management in children

PRAEB 2.6. Equipment's, assessment & treatment in neonatal & pediatric intensive care units

PRAEB 2.7. Recent advances in instrumentations, theories, handling and pediatric physical therapy techniques

PRAEB 2.8. Problem based learning relevant to clinical conditions typically seen in pediatrics

Books for Pediatrics and neonatal sciences

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. Electrodiagnosis 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

6) Master of Physiotherapy in Obstetrics and Gynaecology Sciences

MPT (OG) 104: Clinical, physical & functional diagnosis in in OBG Physiotherapy (OGCPFD)

MPT (OG) 202: OBG physiotherapy (OGPT)

MPT (OG) 203: Recent advances and Evidence Based practice in in OBG Physiotherapy (OGRAEB)

SPECIALITY PAPER -ONE

COURSE CODE: MPT (OG)-104

MPT (OG) 104: Clinical, physical & functional diagnosis in in OBG Physiotherapy (OGCPFD)

OGCPFD 1.0.1. Course Outcomes:

On successful completion of this subject 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

OGCPFD 1.1. GENERAL ANATOMY AND PHYSIOLOGY OBG

1. Anatomy of female reproductive system and abdominal wall
2. Contents of the pelvic cavity- Pelvic diaphragm, Pelvic floor muscles, Perineum and external genitalia
3. Pelvic axis, position, obstetric diameters and shape, abnormal bony pelvis
4. Clinical biomechanics and patho-mechanics of spine, female pelvis, posture, movement and gait.
5. Ovulation induction, Ovarian function, clinical aspects of ovulation

6. Premenstrual syndrome
7. Polycystic ovarian syndrome
8. Menstruation cycle and other clinical phenomena such as amenorrhea, dysmenorrhea, hemorrhagia, polymenorrhea, oligomenorrhea and hypothalamic pituitary dysfunction

OGCPFD 1.2. PREGNANCY, LABOR AND PUERPERIUM

1. Preconception health, factors affecting conception
2. Conception
3. Physiological changes during pregnancy.
4. Physiology of labor.
5. Physiological changes and physical problems in puerperium.
6. Injuries of uterine support & pelvic joints during labor, Repair of perineum after delivery.
7. Anatomical & physiological changes during postpartum period.

OGCPFD 1.3. CONTRACEPTION, STERILIZATION AND FERTILITY

1. Inject able and implantable contraception.
2. Intra uterine devices.
3. Abortion and Miscarriage.
4. MTP and sterilization.
5. Fertility, infertility, sub fertility.

OGCPFD 1.4. Role of PT in high-risk pregnancy

1. Abortion, ectopic pregnancy.
2. Heart disease in pregnancy assessment.
3. Diabetes mellitus in pregnancy.
4. UTI in pregnancy.
5. HIV in pregnancy.
6. Trauma in pregnancy.
7. Hypertension in pregnancy.
8. Gastrointestinal disorders in pregnancy.
9. Viral exposure during pregnancy.
10. Vaginal birth after cesarean section.

OGCPFD 1.5. UROGYNAECOLOGY SYSTEM

1. Review of mechanism of continence and voiding difficulties.
2. Review of Sexual dysfunction in Urogynecology.
3. Assessment of Urinary bladder dysfunction.
4. Genital Prolapse, Assessment and diagnosis.
5. Other displacements of uterus, assessment and diagnosis.
6. Overactive bladder syndrome, assessment and diagnosis.

SECTION- B

OGCPFD 2.1. THE AGEING FEMALE

1. Anatomical & physiological & psychological changes of Menopause
2. Assessment and diagnosis of Senile osteoporosis & related complications
3. The climacteric- assessment and diagnosis

OGCPFD 2.2. INVESTIGATIONS IN OBSTETRICS AND GYNECOLOGY WITH INTERPRETATION

1. Pregnancy tests and investigations
2. Imaging techniques in obstetrics and gynecology
3. Urodynamics investigations
4. Investigations in endocrinal disorders in females
5. Instrumentation for assessment of Pelvic floor muscles- Perineometer
6. Outcome measures in OBG Physiotherapy

OGCPFD 2.3. MISCELLANEOUS

1. Antenatal Physiotherapy assessment.
2. Postnatal Physiotherapy assessment.
3. Breast function, disorders and assessment
4. Abdominal incisions & assessment
5. Anthropometric measurements
6. Assessment, clinical tests and diagnosis of movement dysfunction and other musculoskeletal dysfunctions during pregnancy and postpartum period.

SPECIALITY PAPER TWO

COURSE CODE: MPT-202

MPT (OG) 202: OBG physiotherapy (OGPT)

OGPT 1.0.1. Course outcomes

On successful completion of this subject it is expected that 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

OGPT 1.1. **PHYSIOTHERAPY MANAGEMENT OF MENSTRUAL PROBLEMS**

1. Nutrition in adolescence
2. Physiotherapy management of puberty disorders

OGPT 1.2. **PHYSIOTHERAPY MANAGEMENT OF MATERNAL MUSCULOSKELETAL DISORDERS**

1. Neck and upper back strain
2. TMJ Pain
3. Thoracic outlet syndrome, costal rib pain
4. Carpel tunnel syndrome
5. Dequervain's diseases
6. Diastasis Recti abdominis
7. Sacroiliac joint dysfunction (anterior and posterior innominate)
8. Symphysis pubis dysfunction
9. Low back pain, piriformis syndrome, coccyx pain
10. Knee and patella dysfunction
11. Nerve palsies, muscle and tendon injuries.

OGPT 1.3. **PHYSICAL THERAPY MANAGEMENT DURING ANTENATAL PERIOD**

1. Early bird classes (Classes taken in first or second trimester about nutrition, Exercise, fetal development)
2. Methods of relieving pregnancy discomfort
3. Preparation for labour
4. Relaxation techniques and Stress Management during pregnancy
5. Aquanatal exercises during antenatal period
6. Exercise prescription during antenatal period
7. Orthotic management during pregnancy
8. Ergonomics in pregnancy

OGPT 1.4. **PHYSICAL THERAPY MANAGEMENT DURING LABOUR PAIN**

1. Perinatal care- Coping strategies for labour
2. TENS in labour
3. Traditional practices related to pregnancy and postpartum management
4. Positions for delivery, types of delivery
5. Pain management and management of discomforts during labour
6. Maternal positions and state during labour
7. Stress management during labour
8. Relaxation techniques
9. Breathing techniques
10. Massage

OGPT 1.5. **PHYSICAL THERAPY MANAGEMENT DURING POSTPARTUM PERIOD**

1. Exercise prescription during postpartum period
2. Lactation management and breast clinic
3. The postnatal period, postnatal exercises and advise
4. Alternative therapies related to pregnancy and postpartum management
5. Schools of manual therapy and joint mobilization techniques
6. Aquanatal exercises during postnatal period
7. Orthotic management during postpartum

8. Stress management during postpartum period
9. Maternal position and state during postpartum period
10. Ergonomic advice in postpartum period
11. Massage techniques
12. Handling techniques of new born

SECTION- B

OGPT 2.1. **GENERAL GYNAECOLOGICAL INFECTIONS**

1. Physiotherapy management for incontinence
2. Physiotherapy management for genital prolapse
3. Physiotherapy management for endometriosis
4. Physiotherapy management for chronic pelvic pain and dyspareunia
5. Physiotherapy management for pelvic inflammatory disease
6. Physiotherapy management for sexually transmitted diseases

OGPT 2.2. **PHYSIOTHERAPY MANAGEMENT FOR SEXUAL DYSFUNCTION**

1. Sexual desire disorders- Hypoactive sexual desire dysfunction, Sexual Aversion disorders
2. Sexual arousal disorders
3. Sexual pain disorders- Dyspareunia, Vaginismus
4. Female orgasmic disorder

OGPT 2.3. **OPERATIVE PROCEDURES AND PHYSIOTHERAPY MANAGEMENT**

1. Principles of surgery and physiotherapy management of intra operative complications
2. Preoperative and post operative care
3. Hysterectomy and Physiotherapy management
4. Fertility awareness and family planning methods
5. Cancer rehabilitation (Breast and Cervical cancer)

OGPT 2.4. **MISCELLANEOUS**

1. Physiotherapy management for musculoskeletal complications during menopause
2. Nutrition for menopause women
3. The method of infection control for physiotherapist working with women's health
4. Assisted reproduction treatments

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SPECIALITY PAPER -THREE

COURSE CODE: MPT-203

MPT (OG) 203: Recent advances and Evidence Based practice in in OBG Physiotherapy (OGRAEB)

OGRAEB 1.0.1. 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

OGRAEB 1.1. Antenatal Pilates and Postnatal Pilates Alternative therapies in OBG conditions

OGRAEB 1.2. Alternate approaches to fitness in antenatal and postpartum period

OGRAEB 1.3. Recent advances in outcome measures used in OBG physical therapy

OGRAEB 1.4. Recent advances in evaluation and treatment of maternal musculoskeletal disorders in obstetrics and gynaecology

OGRAEB 1.5. EBP and Recent advances of electrotherapy in OBG Physiotherapy EBP and Recent advances of exercise therapy in OBG Physiotherapy

SECTION- B

OGRAEB 2.1. EBP and Recent advances of Hydrotherapy in OBG Physiotherapy

OGRAEB 2.2. EBP and Recent advances of Thermotherapy in OBG Physiotherapy

OGRAEB 2.3. EBP and Recent advances of Cryotherapy in OBG Physiotherapy

OGRAEB 2.4. EBP and Recent advances of joint mobilization techniques in OBG Physiotherapy

OGRAEB 2.5. Recent Advances in Pelvic Floor Assessment, Devices/ Instrumentation for pelvic rehabilitation

OGRAEB 2.6. EBP of Nutrition in women from adolescence to menopause

OGRAEB 2.7. EBP and Recent Advances in PT following OBG surgeries

OGRAEB 2.8. EBP and Recent Advances in Breast Disorders from menarche to menopause

OGRAEB 2.9. Recent Advances in evaluation and treatment in musculoskeletal conditions – Puberty, Reproductive, Menopausal women

Recommended Reading for OBG Physiotherapy

1. Gray, Henry. Anatomy of the Human Body,
2. C.Guyton, John E. Hall, Textbook of medical physiology, W.B. Saunder 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.
5. Ruth Sapsford, Joanne Bullock-Saxton, Sue Markwell. Women's Health: A Textbook for Physiotherapists,
6. Scientific basis of human movement –Gowitzke, Williams and Wilkins, Baltimore,
7. Clinical biomechanics of spine – White A, and Panjabi- J, B. Lippincot, Philadelphia
8. Physiotherapy in Obstetrics and Gynaecology- 2nd edition- Jill Mantle, Jeanette Haslam, Sue Bartom. Forwarded by Professor Linda Cardow
9. Physiotherapy in Obstetrics &Gynaecology – Polden& Mantle, Jaypee Brothers, New Delhi,
10. D.C Datta -Textbook of Gynaecology. 1st edition
11. Women's Health- A textbook for Physiothgerapists. R. Sapsford J. Bullock. Saxton. S, Markwell. -(W.B. Saunders)
12. Obstetrics &Gynaecologic care in Physical Therapy - 2nd edition - Rebecca. C. Stephenson, Linda. J. O'contuor
13. Clinical Cases in Obstetreics & Gynaecology - Haresh U. Doshi, published by Arihant publishers
14. Advanced in Obstetrics &Gynaecology (vol 2) - ShaliniRajaram, Sumita Mehta, Niraj Goel (Jaypee brothers.
15. Physiotherapy Care for Women's Health – R. Baranitharan, V. MahalaKshmi (jaypee brothers)
16. Williams O Obstetrics- 22nd edition- F. Gary Cunninghan, Krenneth J Leveno, Steven L Bloom.
17. Women's Health- 5th edition edited by Deborah Waller, Ann McPherso (oxford)
18. Het's Manual of Pelvic floor rehabilitation
19. Het's MMT for assessment of pelvic floor muscles.
20. 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

7) Master of Physiotherapy in Oncology Sciences

MPT (O) 104: Clinical, physical & functional diagnosis in **oncology** physiotherapy (OCPFD)

MPT (O) 202: **Oncology** physiotherapy (OPT)

MPT (O) 203: Recent advances and Evidence Based practice in **oncology** PHYSIOTHERAPY (ORAEB)

SPECIALITY PAPER ONE

COURSE CODE: MPT (O)-104

MPT (O) 104: Clinical, physical & functional diagnosis in oncology physiotherapy (OCPFD)

OCPFD 1.0.1. **Course Outcome:** On successful completion of this subject it is expected that students will be able to-

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

OCPFD 1.1. Assessment of clinical signs and symptoms, physical and functional evaluation, differential diagnosis of (bone and soft tissue, breast, gynecological, lung,

OCPFD 1.2. GI, head and neck and pediatric cancers

OCPFD 1.3. clinical analysis of cardiorespiratory fitness, posture, gait, movement and movement dysfunction in cancer patients

OCPFD 1.4. 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.

OCPFD 1.5. 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.

OCPFD 1.6. Principles of pathological, hematological, bacteriological investigations related to oncological disorders with interpretation.

SECTION- B

OCPFD 2.1. Influence and relation of physical activity, diet, nutrition, life style, obesity and anthropometric measurement in cancer Neuropsychological tests.

OCPFD 2.2. Evaluation of Cancer Complications like Lymphedema, musculoskeletal, neurological, cardio respiratory. Exercise and cancer related fatigue and its evaluation

OCPFD 2.3. Detailed lymphatic system examination

OCPFD 2.4. Medical intervention (radiation, chemotherapy and surgery) in cancer

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SPECIALITY PAPER TWO

COURSE CODE: MPT(O)-202

MPT (O) 202: Oncology physiotherapy (OPT)

OPT 1.0.1. Course Outcome: On successful completion of this subject, it is expected that students will be able to-

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. Generateaprimarydiagnosisandalistofdifferentialdiagnosesconsistentwithtypicalpresentations.
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

OPT 1.1. Assessment of clinical signs and symptoms, physical and functional evaluation, differential diagnosis of (bone and soft tissue, breast, gynecological, lung,

OPT 1.2. GI, head and neck and pediatric) cancers

OPT 1.3. clinical analysis of cardiorespiratory fitness, posture, gait, movement and movement dysfunction in cancer patients

OPT 1.4. 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.

OPT 1.5. 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.

OPT 1.6. Principles of pathological, hematological, bacteriological investigations related to oncological disorders with interpretation.

OPT 1.7. Influence and relation of physical activity, diet, nutrition, life style, obesity and anthropometric measurement in cancer Neuropsychological tests.

OPT 1.8. Evaluation of Cancer Complications like Lymphedema, musculoskeletal, neurological, cardio respiratory. Exercise and cancer related fatigue and its evaluation

OPT 1.9. Detailed lymphatic system examination

OPT 1.10. Medical intervention (radiation, chemotherapy and surgery) in cancer

OPT 1.11. Oncology-Epidemiology, classification, symptomatology, patho- physiology and management of different oncological condition

OPT 1.12. Common pediatric oncology conditions and their assessment, signs and symptoms medical management and Physiotherapy treatment

OPT 1.13. Common pediatric oncology conditions and their assessment, signs and symptoms medical management and Physiotherapy treatment.

SECTION- B

Physiotherapy intervention for

OPT 2.1. Head and neck cancers.

OPT 2.2. Breast cancer

OPT 2.3. Cancers of Reproductive system. Bone tumors.

OPT 2.4. Systemic cancers. CNS Neoplasia. Lung cancer.

OPT 2.5. Metastatic cancers Gastrointestinal cancers.

OPT 2.6. Chemotherapy, radiation therapy and adjunct therapy in cancer patients. Physiotherapy management for neuro-musculoskeletal complications due to cancer treatments

OPT 2.7. Physiotherapy management for various dysfunctions (Bowel and Bladder, Sexual, Neuro-musculoskeletal and Nutritional deficiency) seen in cancer patients.

OPT 2.8. Supportive and Palliative therapy, and pain management in cancer and palliative therapy in cancer patients

OPT 2.9. Rehabilitation act and financial aid for cancer patients

OPT 2.10. Psychosomatic conditions in cancer and their management

OPT 2.11. Physiotherapy management in Intensive care units (ICU)of cancer patients

OPT 2.12. Aids and appliances, adaptive functional devices to improve dysfunction in cancer patients

OPT 2.13. 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

OPT 2.14. Problem based learning for various clinical conditions in oncology Physiotherapy

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SPECIALITY PAPER THREE

COURSE CODE: MPT(O)-203

MPT (O) 203: Recent advances and Evidence Based practice in ONCOLOGY PHYSIOTHERAPY (ORAEB)

Recent advances and evidence-based practice in oncology Physiotherapy

ORAEB **1.0.1.** **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 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

ORAEB 1.1. Recent advances in oncological Physiotherapy and Evidences in interventions for oncology related impairments.

ORAEB 1.2. Genetic counselling, Stem cell therapy, Gene therapy, Targeted therapy, Immunotherapy, hormone therapy, thermal ablation, radionics, atomics and Nano medicine

ORAEB 1.3. Recent advances in pain modulation and rehabilitation

ORAEB 1.4. Institutional & community-based rehabilitation and vocational rehabilitation in oncological patients

ORAEB 1.5. Recent advancement in oncology Orthosis – prescription and training. Prosthetic management for mastectomy

ORAEB 1.6. 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

ORAEB 1.7. Recent oncological Physiotherapy technique - Mental imagery technique, virtual reality therapy, Pilate's therapy, Hydrotherapy/ Aqua therapy in oncological patients.

SECTION- B

ORAEB 2.1. Impact of cancer treatment on function and its rehabilitation Psychosocial impact on cancer patient, spouse, family members, society

ORAEB 2.2. 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.

ORAEB 2.3. Recent advances in Physiotherapy management of head Neck cancer Recent advances in Physiotherapy management of breast cancer

ORAEB 2.4. Recent advances in Physiotherapy management of Bone tumors

ORAEB 2.5. Recent advances in Physiotherapy management of Lung and respiratory tract Cancer Recent advances in physiotherapy management of systemic cancer

ORAEB 2.6. Sports and physical training in oncological conditions

Recommended books for Oncology Physiotherapy

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 Edurdo 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 Onco5l0o0gy; 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 Musculoskeltal 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 Resou5r0c1es 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 Rehabilation 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

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8) Master of Physiotherapy in Community Rehabilitation Sciences.

MPT (R) 104: **Physiotherapy in Community Rehabilitation Sciences** (PRC)

MPT (R) 202: **Rehabilitation –Assessment, Evaluation and Assistive Technology** (RAEA)

MPT (R) 203: **Physiotherapy in Clinical Rehabilitation conditions** (PCR)

REHABILITATION COURSE CODE: MPT (R)-104

Course Title: MPT (R) 104: **Physiotherapy in Community Rehabilitation Sciences** (PRC)

Section-A

PRC 1.1. Definition, Concept, principles & Scope of Rehabilitation, Community, Healthcare 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.

PRC 1.2. Epidemiology of dysfunctions & advance skills of physical and functional assessment related to Community. Clinical decision-making skill in management of dysfunction

PRC 1.3. Evidence Based Practice & Recent advances in Community Health. Indian Health statistics

SECTION-B

PRC 2.1. Fitness and health promotion –

i. Principles of fitness for health promotion in community,

ii. Nutrition and Diet.

iii. Stress management through yoga and psycho- somatic approaches.

PRC 2.2. Natural calamity & disaster management – Role of P.T. in disaster management team.

PRC 2.3. I.C.F. [Impairment, Disability, Persons with Disabilities and its implications] Evaluation of Disability & Compensation for Persons with disability Act – 1995 and related Government infrastructure.

PRC 2.4. Physiotherapy Ethics –

i. Code of conduct,

ii. Regulatory Agencies and Legal Issues.

iii. W.H.O.`s policies-about rural Healthcare –

iv. 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 Persons with Disabilities,

PRC 2.5. Public health education methods and appropriate media – Public awareness to the various disabilities, communications, message generation and dissipation.

PRC 2.6. Role of Government & NGOs in CBR, inter-sectoral programs and co- ordination, Implementation of the Act.

PRC 2.7. Rights of persons with disability

Specialty 2

COURSE CODE: MPT (R)-202

Course Title: MPT (R) 202: **Rehabilitation –Assessment, Evaluation and Assistive Technology** (RAEA)

SECTION- A:

RAEA 1.1. Orthotics & Prosthetics: definition, classification, bio mechanical principles; assessment and evaluation, prescription & fabrication

RAEA 1.2. Designing & Training of UL, LL, trunk, neck Orthosis, footwear modifications in various conditions

RAEA 1.3. Designing & Training of UL, LL prosthesis in Amputees.

RAEA 1.4. Indications / Contraindications, psychological aspects of its application.

RAEA 1.5. Use of adaptive devices, design & construction e.g. canes, walkers, wheelchairs.

SECTION- B: Industrial Health

RAEA 2.1. Applied anatomy, physiology and biomechanics related to Industrial health.

RAEA 2.2. Clinical decision-making skill in assessment and management of dysfunction related to Industrial health.

RAEA 2.3. Industrial Physiotherapy- prevention of injuries, physiological restoration, rehabilitation in industrial injuries, work station adaptations/ modifications.

RAEA 2.4. Environmental stress in the industrial area --Accidents due to

1. Physical agents- e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing radiation.
2. Chemical agents-Inhalation, local action, ingestion,

3. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & evaluation of work place-mechanical stresses as per hierarchy –

   i. Sedentary table work –executives, clerk,

   ii. Inappropriate seating arrangement- vehicle drivers

   iii. Constant standing- watchman- Defence forces, surgeons,

   iv. Over-exertion in labourers - common accidents

4. Psychological hazards- e.g.-executives, monotony & dissatisfaction in job, anxiety of work completion with quality,

   i. Role of P.T. in Industrial setup & Stress management- relaxation modes.

   ii. Physiotherapy role in industry – preventive, promotive, curative, intervention, ergonomic and rehabilitative services.

   iii. Ergonomic considerations and health promotion in the industry

RAEA 2.5. Understanding, and anlysing occupation, job description, job demand analysis, task analysis, Employee fitness, job modification, Employment acts.

RAEA 2.6. Vocational Rehabilitation, evaluation & management.

COURSE CODE: MPT (R)-203

Course Title: MPT (R) 203: **Physiotherapy in Clinical Rehabilitation conditions** (PCR)

SECTION-A

PCR 1.1. Rehabilitation in musculoskeletal conditions, sport sciences and health promotion

PCR 1.2. Rehabilitation in cardio-pulmonary conditions, and health promotion

PCR 1.3. Rehabilitation in Geriatric conditions

PCR 1.4. Rehabilitation in women's Health

SECTION -B

PCR 2.1. Rehabilitation in neurological conditions, movement & psycho-somatic disorders, pediatric conditions

PCR 2.2. General fitness strategies- body mass composition, assessment, obesity and weight control

5.22. Skills based outcomes and monitorable indicators for Master of Physiotherapy

5.22.1. 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
    i. Demonstrate professional practice.
    ii. Demonstrate autonomous Physiotherapy practice.
    iii. Demonstrate the ability to search and retrieve scientific literature
    iv. Demonstrate an understanding of research methods.
    v. Demonstrate the ability to critically analyse scientific literature
    vi. Prepare Report findings of critical analysis in a scientific format

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5.22.2. The Table shows Skill based Learning Outcomes and monitorable indicators:

Table 5.6: Skill based Learning Outcomes, knowledge and monitorable indicators

Sl. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1.	Analyse and discuss the biomedical, behavioural and social science bases of Physiotherapy and integrate the bases into Physiotherapy practice	i. Be familiar with normal & abnormal patterns of human development and movement. ii. 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. iii. Able to understand the concept of health & its contribution to well- ness.	a. Analyse normal and abnormal patterns of human development and movement. b. Demonstrate understanding of structural and functional anatomy. c. Identify anatomical structure from surface landmarks. d. Describe the normal physiological process and the changes throughout the life span. e. Analyse basic human movement. f. Evaluate the significance of healthy lifestyles for patients/ clients
2	Collects assessment data relevant to the client's needs and Physiotherapy practice.	i. Informs the client of the nature and purpose of assessment as well as any associated significant risk.	a. Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment. b. Monitors the client's health status for significant changes during the course of assessment and takes appropriate actions as required. c. Perform assessment procedure safely and accurately , taking into account client consent, known indications, guidelines, limitations and risk- benefit considerations.

Sl. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	i. Be familiar with different assessment techniques. ii. 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. iii. Be familiar with special tests. iv. Basic knowledge on radiological findings & other investigations. v. Demonstrate clinical reasoning with choice of assessment and ex- amination procedures	a. Perform patient assessment technique to know the condition and to gather information about his/ her ailment. b. Safely and accurately examines and re-examines a patient using standardized measures. c. Apply pertinent tests and measurements. d. Interpret all assessment findings to allow for identification of the patient's/client's impairments, activity limitations and participation restrictions. e. Interpret findings and reach a differential diagnosis f. Establish a diagnosis for physiotherapy, identify risks of care, and make appropriate clinical decisions based upon the examination, evaluation and current available evidence.
4	Assess, analyse, and plan Physiotherapy management	i. Identify the principles of assessment, clinical reasoning, problem identification, goal set- ting, treatment planning. ii. Be familiar with different assessment techniques and protocols. iii. Know the protocols used in the department. iv. Justify treatment choices with a sound pathophysiological rationale`	a. Develop rapport to obtain history, current health status and previous functional abilities. b. Interpret the patient's/client's verbal and non-verbal responses. c. Determines the personality traits and analyze how the differences in personality influence approach d. Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment.

Sl. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
5.	Apply and evaluate Physiotherapy management	i. Know the protocols used in the department. ii. Understand and Prevent/minimise risks and hazards during Physiotherapy interventions iii. Establish equipment is within safety check time frames. iv. Demonstrate knowledge of emergency procedures	a. Demonstrate safe, effective and efficient interventions. b. Evaluate the effectiveness of the Interventions
6	Advise patient on appropriate nutrition, exercises, rest, relaxation other issues	i. Explain the impact of exercise and nutritional status of patient during treatment	a. Assess the patient's status after exercise and proper diet.
7.	Demonstrate professional Practice.	i. Demonstrate attitudes and behavior acceptable to society and the profession ii. Practise in accordance with the Standards of Ethical Conduct iii. Explain the health and safety issues for patients and staff iv. Able to deliver safe, effective and timely Physiotherapy interventions v. Recognizes risk & hazards which can happen during intervention. vi. Ability to reflect and evaluate own practice vii. Modify and adapt professional practice in response to evaluation	a. Demonstrate professional behavior. b. Demonstrate safe Practice Plan and show evidence of Professional development.
8.	Demonstrate autonomous Physiotherapy practice	i. Recognize the critical conditions of patients ii. Be familiar with current literature and evidence based best practice	a. Independently assess and treat patients with single or multiple problems which needs physiotherapeutic intervention. b. Demonstrate an ability to refer to other health professionals when beyond the scope of Physiotherapy

Sl. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
9.	Demonstrate the ability to search and retrieve scientific literature	i. Define search terms Knowledge on available data search resources ii. Identify relevant sources of Research	a. Develop and modify search strategies appropriately complete searches using relevant and available resources such as electronic data bases. b. Discuss different methods of statistical analysis in relation to different research designs. c. Discuss the possible ethical implications and requirements in health research
10.	Demonstrate an understanding of research methods.	i. Have a basic understanding of the value of different research paradigms to Physiotherapy research. ii. Demonstrate a basic understanding of research processes. iii. Understand the ethics of the research process including plagiarism and consent	a. Describe appropriate research methodologies that may be used to examine a variety of research questions. b. Describe the key elements of research design. c. Describe different methods of data Collection. d. Demonstrate knowledge of basic biomedical statistics
11	Demonstrate the ability to critically analyse scientific literature	i. Identify appropriate criteria to assess quality of different types of literature.	a. Demonstrate an understanding of the process of critical review. b. Demonstrate the use of an appropriate critiquing tool to guide interpretation. c. Critically analyse an appropriate selection of scientific papers

Sl. No.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
12	Prepare Report findings of critical analysis in a scientific format	i. Be familiar with different writing format depending on the re search methodology. ii. Be familiar with different referencing styles. iii. Knowledge on presentation methods. iv. Integrate the current literature into physio- therapy practice	a. Use standardized writing format b. Cite references using a recognized scientific method c. Demonstrate an ability to synthesise information from several resources d. Demonstrate the ability to communicate research findings using a variety of presentation methods. e. Critique current Physiotherapy practice with reference to contemporary research literature

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CHAPTER 6

PhD Programe in

Physiotherapy

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
राष्ट्रीय सहबद्ध और स्वास्थ्य देख-रेख वृत्ति आयोग
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Ph.D. Physiotherapy Therapy (Ph.D)

6.0. Purpose: Doctoral education is to prepare scholars who will contribute both to the development and application of knowledge in the field of Physiotherapy for enhancing quality of education, research, practice and dissemination of knowledge.

6.1. Objectives

The Ph.D. in Physiotherapy will be able to

1. Conduct original research aimed at expanding the understanding of Physiotherapy related Topics/ subject. Contribute new knowledge to the field of Physiotherapy sciences through Assessment and interventions. experimentation, and analysis.
2. Explore the application of scientific findings to diagnose, treat, and manage Physiotherapy Treatment.
3. Innovate new methodologies, techniques, or therapies for improving renal health outcomes and patient care.
4. Collaborate with experts from various disciplines to gain a comprehensive understanding of Physiotherapy science.
5. Publish research findings in peer-reviewed journals and present at conferences to contribute to the broader scientific community and advance the field of Physiotherapy.
6. Acquire advanced skills in research methodology, data analysis, critical thinking, and scientific communication, preparing for careers in academia, research institutions, healthcare etc.

6.2. Research Guide/ Co Guide

1. Guides can select maximum any Eight scholars at any given period of time as per the seniority in respected university. Principal/ Dean/ Professor – Eight PhD scholars, Associate professor – Five PhD scholars.
2. Scholars can have co-guide from other discipline, if required.
3. Ph.D. in Physiotherapy
4. The Guide should be from the same University

6.3. Eligibility Criteria for Research Guide

1. Ph.D. In Physiotherapy with minimum 3 scientific publications in Accredited National/International Journals / scientific publications in Accredited National/International Journals. (SCOPUS / WOS / PUBMED / UGC Care)
2. Maximum age to be a guide shall be 65 years.
3. Guide cannot have more than 8 candidates at any given point of time
4. Candidate can have Co-Guide from other discipline, if required.

6.4. Research Scholars

1. **Full time or Part time Scholars**

    i. Full time research scholars are those who register for Ph.D. on full time basis and are not employed anywhere.

    ii. Part time research scholars are those who are presently employed in any College/Hospital/ Institute.

2. **Research Guide:** The scholars can select the guide from the list of guides recognized by the respective University.

3. **Eligibility Criteria for Research Scholars**

    1. Full time Post Graduate degree in Physiotherapy from a recognized university for enrolment in Ph.D. in Physiotherapy in the respective University.

    2. The scholars should have passed Post Graduate with a minimum of 55% marks.

    3. Working in Teaching Institution/Hospital can opt for Part Time PhD.

    4. **Criteria for Selection:**Selection for the Ph.D. Program will be based on merit by university entrance examination.

5. **Duration**

    1. Full time: Three years, maximum of five years.

    2. Part time: Four years, maximum of six years.

    3. A candidate can register for Ph.D. program on part time basis. A candidate should complete research work and submit the thesis to the University within four years from the date of provisional registration.

    4. Maximum period for submission of thesis will be Six years from the date of provisional registration subject to the approval from the Board of Research Studies/Doctoral Studies on the recommendations of the guide. There will be no provision for further extension of the period.

6.5. Mode of Admission:

1. No Higher Educational Institution or research institution of the Central government or a State Government shall conduct Ph.D. (Physiotherapy) programmes through distance and/or online mode.

2. No Candidate shall be admitted for Ph.D. in Physiotherapy in Distance Education and / or Online mode.

6.6. **Board of Research/Doctoral Studies:** The Board/Committee will consist of

1. Dean
2. Ph.D. qualified Committee Members
3. Two Subject Experts.

6.7. Progress Report

1. After provisional registration, every candidate shall submit half yearly progress report regularly through the guide.
2. Half yearly report shall be submitted for the period from 1st January to the end of June and from 1st July to the end of December. However, the first report for the fraction of six months period shall be submitted ending either in June or December.
3. The half yearly progress report shall cover the following aspects:
   i. Progress in the review of literature,
   ii. New data acquired or theoretical background/techniques developed,
   iii. Progress/Standardization in research methodology,
   iv. Discussion of the work done.
4. If the candidate fails to submit two consecutive half yearly progress reports in time, his/her provisional registration shall stand cancelled.
5. If two consecutive half yearly progress reports are not satisfactory, the Board/respective Committee shall recommend to the University for Cancellation of the registration.

6.8. **Pre-Ph.D. Examination:** The scheme of Pre-Ph.D. examination to be conducted by the University shall be as follows:

Sr No	Subject	Marks	Passing Marks
Paper I	Research Methodology & Biostatistics	100	55
Paper II	Domain Specific-Physiotherapy	100	55

6.9. Assessment, Evaluation methods and Minimum standards/credits required

1. After successfully completing the coursework and achieving the marks/grade specified above ,the Ph.D. scholar must undertake research work , submit title and produce a draft Thesis.
2. **The title of Thesis must be approved by Registered Institutional Ethical committee.**
3. **The PhD scholar must publish Two scientific papers related to the Thesis Title work in** scientific publications in Accredited National/International Journals / scientific publications in Accredited National/International Journals. (SCOPUS/WOS/PUBMED/UGC Care)

4. **The PhD scholar must present Two scientific papers related to the Thesis Title work in National /International conference.**

5. The candidate who has completed the minimum required period of three or four years of prescribed research from the date of provisional registration, with at least three months remaining before the maximum period prescribed for thesis submission, may submit an application. This application, along with three copies of the Thesis synopsis, is to be submitted through the Guide and the Head of the institution to the respective Board of Research Studies/Committee, following University procedures.

6. Prior to submitting the dissertation/thesis, the Ph.D. scholar is required to deliver a presentation before the Research Advisory Committee of the respective Institution. Upon approval, two copies of the approved final synopsis (in hard copy/CD format) are forwarded to the Board of Research/Doctoral Studies/Evaluation Committee. This committee proceeds to constitute a Board of Examiners for the adjudication of the Ph.D. thesis, ensuring readiness prior to the thesis submission.

7. The concerned Higher Educational Institution must have a mechanism, utilizing well-developed software applications, to detect plagiarism in research work. Research integrity is an essential component of all research activities leading to the award of a Ph.D. degree.

8. A Ph.D. scholar must submit the thesis for evaluation within six months after the final synopsis submission, along with

    i. a declaration from the Ph.D. scholar confirming the absence of plagiarism and

    ii. a certificate from the Research Supervisor affirming the originality of the thesis and stating that the thesis has not been submitted for the award of any other degree/diploma from any other Higher Educational Institution.

9. The Ph.D. thesis submitted by a Ph.D. scholar will be evaluated by their Research Supervisor and at least two external examiners who are experts in the field and not employed by the concerned Higher Educational Institution. These examiners should be academics with a strong record of scholarly publications in the field. Whenever feasible, the external examiners should be selected from outside State /India (Desirable). The viva-voce examination panel will include the Research Supervisor and one of the two external examiners. The viva-voce examination will be open to members of the Research Advisory Committee, faculty members, research scholars, and students.

10. The viva-voce examination of the Ph.D. scholar to defend the thesis will be conducted if both external examiners recommend acceptance of the thesis after incorporating any suggested corrections. If one of the external examiners recommends rejection, the concerned Institution will forward the thesis to an alternate external examiner from the approved panel of examiners, and the viva-voce examination will only be held if the alternate examiner recommends acceptance of the thesis. If the alternate examiner does not recommend acceptance of the thesis, the thesis will be rejected, and the Ph.D. scholar will be deemed ineligible for the award of a Ph.D.

6.10. Award of Ph.D. Degree

1. The degree will be awarded by the University, after the candidate successfully completes Viva-Voce examination. The Chairperson shall consolidate the recommendations for the award of Ph.D. degree based on the following:
    a. The report of examiners who adjudicated the thesis,
    b. Evaluation of the candidate's performance in the Viva-Voce examination.
2. The Chairperson shall forward the consolidated and individual reports with recommendation to the of the University.
3. Based on these reports, the University shall award the Ph.D. degree after the recommendations are approved by the Vice-Chancellor.

6.11. Submission of Thesis in Shodhganga: All candidates from any University, including deemed-to-be universities in India, are required to submit their theses to Shodhganga. Theses can be submitted by candidates, supervisors, or university representatives using the format prescribed by the INFLIBNET Centre. Universities are responsible for providing computer and network infrastructure, software, and support staff to assist researchers in submitting their thesis online. It is mandatory for universities to submit soft copies of theses and dissertations to the INFLIBNET Centre within one month of awarding doctoral degrees.

6.12. Academic, research, administrative, and infrastructure prerequisites for Colleges to be recognized for offering Ph.D. programs are as follows:

Colleges/Institution which offer Post-graduate Programs, are eligible to offer Ph.D. programs if they fulfil the criteria for eligible Research Supervisors, necessary infrastructure, and requisite administrative and research facilities.

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Chapter 7
Job Description

Chapter 7: Job Description for all levels

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

7.1. **Clinical Physiotherapist**

1. Patient identification and verification of the patient and assisting in treatment implementation.
2. Basic knowledge in Physiotherapy protocol
3. Treatment preparation
4. Data entry including treatment recording
5. General knowledge pertaining to biomedical waste disposal
6. Familiarization with Physiotherapy equipment
7. Knowledge of patient transport and physiotherapy equipment management.
8. Physiotherapy Equipment preparation for the simulation and treatment
9. Basic Knowledge of exercise therapy and electrotherapy and its implementation.
10. Information management / communication for inter disciplinary
11. Supervision of the Physiotherapy procedure, health and safety
12. Professional responsibility including quality check on treatment delivery, chart verification
13. Special procedures for treatment and assessment including MMT, different mobilization etc.

7.2. **Senior Clinical Physiotherapist/ Superintendent Physiotherapist**

1. Professional developmental skill
2. Special treatment skill
3. Ability to critically evaluate practice
4. Verifies the accuracy of the patient Physiotherapy procedure before and after the treatment Monitors the patients for clinical reaction for all the patients

7.3. **Chief Physiotherapist**

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

7.4. **Assistant prof / Asst Prof Senior /Associate Professor /Professor**

1. Standardizing the teaching skills and implementing curriculum of the teaching program.
2. Involvement in research and development

7.5. **Professor/Dean/Director Physiotherapy/Head of Physiotherapy Department/Assistant Director General**

1. Setting the guidelines
2. Judgment on all aspects of Physiotherapy work
3. Protocol development on treatment delivery and Quality Assurance
4. Involvement on departmental up gradation programme
5. Assesses service procedure and environment to meet established guidelines for proper working and adjust the action plan as per clinical compliance

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Chapter 8
Scope of Job and areas of Physiotherapy Interventions

8.Scope of Job and areas of Physiotherapy Interventions

8.0. Whereas Physiotherapy field and Physiotherapy services has extended to the added services in various specialties like Early Intervention, Preventive Medicine (Cardiac/Pediatric field etc), Sports Physiotherapy, Ergonomics, Community Based Rehabilitation, Manual Therapy and delivering excellent services for betterment of mankind. The following specialty area in the field of Physiotherapy, will create posts and special units from the level of Primary Health Centers up to Medical College Hospitals (both in public and private centers) to deliver up-to-date care to common public and Research Scientists in the special programs.

8.1. Physiotherapy Services Network: Professionals like Doctors, Dentists, Nurses, and other Allied Health Sciences persons, Physiotherapy Services and Physiotherapists' MUST have network and linked services. The Physiotherapy services and Physiotherapy Departments/units must have linked referral services of patients and follow-up documentation from PHC level to Medical College Hospitals to provide continued follow-up service and current new area of services to society effectively. The following area has to be established to deliver added services in Physiotherapy in various levels.

1. **Early Identification/ Intervention Centers**
2. **Rural Preventive Care Centers:**
    i. **Preventive Cardiac Care**
    ii. **Preventive Disability Care**
    iii. **Diabetic Care program**
3. **Role of Physiotherapy in Women's Health**
    i. **Anti-natal & Post Natal care**
4. **Community Based Rehabilitation**
5. **Ergonomics care program**
6. **Sports Injuries care centre**
7. **Pediatric Care Units**
8. **Disaster prevention, training and management Teams**
9. **Preventive Physiotherapy Care in IT Industry**
10. **Role of Physiotherapy in Geriatric Health**
11. **Role of Physiotherapy in Oncology and Cancer Survivors**
12. **Role of Physiotherapy in Indian Defense Services**
13. **Emergency Care and ICUs**
14. **Preventive Care in Schools and Colleges**

15. **Research Scientists**

16. **Hospital Administrative Services**

17. **Space and Oceanography**

18. **Indian Administrative Services**

19. **Insurance Team Consultants and Advisors**

1. **Early Identification/ Intervention Centers:** We noticed that awareness of benefits of Physiotherapy for early orthopedic, Neurological and Pediatric conditions are very poor and those therapeutic values are not delivered to the rural population due to lack of Physiotherapy services. Certain Exercise program will minimize the disability/deficit levels of individuals if it is identified and treated in early stage and the individual's performance skill will grossly increase. This is as good as delivering a large Rehabilitation to rural Population. Hence five Physiotherapists must be posted in all the primary Health Centers in Govt and those posted persons must be assigned to screen all the Schools Children, Community Centers and Rural Population and treat and educate them about the precautions to be taken. Cases detected in the large at Taluk, District and Medical College Institutions must be referred to such Physiotherapists in Primary Health Centers to deliver proper Physiotherapy care exercise program and modified life style if required.

2. Rural Preventive Care Centers:

i. Preventive Cardiac Care: You must be aware that large number of people dies due to Cardiac arrest now days. This is due to improper diet habits and lack of Exercise programs. The Cardiologists have suggested that many Cardiac Arrest cases can be prevented or incidents can be minimized be proper exercise program (METS Exercise). This is a specialized training given to Physiotherapists during the BPT program Hence Physiotherapy Units can be created at various levels at Taluk, District and Medical College Institutions to deliver this Preventive Cardiac Care Centers. We can use the Physiotherapists posted at Primary Health Centers to follow-up the programs and keep reporting periodically to the main centers at District Head Quarts Hospitals.

ii. Preventive Disability Care: Lots of Physical disabilities can be treated if it is identified at an early stage. Many of the rural people identify the physical disability of their children at a later stage due to which rehabilitating them become difficult. Rural poor people do not get the early Physiotherapy services which are very vital. Hence Physiotherapists should assigned to asses all the school children and rural population by periodical camps which will help to identify the minor physical disabilities and Physiotherapy services can be extended at the village level so that they do not have to go the nearby bigger carters. It is appropriate to note that Govt is allotting huge amount for rural rehabilitation. Early Physiotherapy services will reduce the physical illness state of rural population.

iii. Diabetic Care program: Diabetic is the largest problem in India. Proper tailor made exercise program to such people has scientifically shown to prevent lots of post diabetic complications. Hence a diabetic care Physiotherapy unit must be established in all rural areas to deliver proper health care.

3. **Role of Physiotherapy in Women's Health :** Physiotherapy plays a significant role in women's health by addressing assessment and interventions during antenatal and postnatal Care, pelvic floor health, menstrual health, dysmenorrhea, endometriosis. Physiotherapists have a significant role in pain management strategies and exercise programs to help manage symptoms in cases of oncology and survivors, in osteoporosis prevention and management, chronic pain management in managing chronic pain conditions like fibromyalgia, vulvodynia, and chronic pelvic pain and in women's health education and can significantly improve women's health, quality of life, and overall well-being.

   i. **Anti-natal & Post Natal care: Many of the women health care units and experts face lots of gynecological** and orthopedic problems after pregnancy and child birth. This is due to lack to postural awareness, anti-natal and post-natal exercise program. This is a special program learnt by Physiotherapist during BPT course. Govt is providing lots of special care and programs for women's health and child birth. But Gynecological and orthopedic problems occur due to lack of Physiotherapy program to rural populations. Hence a Physiotherapist should be assigned to give pre and post natal care and teach regular exercise program to all pregnant women. This can be combined with primary women's health program and staff. Hence it is highly important to have Physiotherapist posted in all primary health centres to take care of his work.

4. **Community Based Rehabilitation:** There are multi-community populations living together with different life style and habits and customs. Even the day to day living including their working area, living pattern varies between each other. Hence, we Physiotherapists design home program suggest and design modifications etc to suit their life style. This is part our Physiotherapy learning. Hence, we can give tailor made programs rural populations.

5. **Ergonomics care program:** With kind support of our government, rural Industrial growth and use of Computer by village people has considerably increased. But lack of postural awareness and improper position and work style in a long run many will land into orthopedic problems. Physiotherapists are specially trained to tackle all ergonomics problems and skilled in biomechanics of human body. Hence a Physiotherapist should be assigned to assess all such people to suggest care and exercise program to prevent such problems.

6. **Sports Injuries care center and National and International Sports Programs:** With kind support of our government, Sports field is developing by leaps and bounds in rural areas and lots to sports persons are emerging bringing laurels to the nation. But due to lack of knowledge, unavailability of immediate care in case of sports injury these potential sportsmen fail to recover and succumb to their injuries. As a result they do not succeed to come out as efficient sports persons and fail to add to the long term glory of the nation. Hence rural sports care centre is the dire need of the hour in all villages, for the emergent sports persons.

7. **Pediatric Care Units:** Pediatric physiotherapists play a vital role in promoting healthy development, function, and mobility in children, and their scope of practice continues to evolve with advances in research and clinical practice. Physiotherapy interventions for premature or critically ill newborns, focusing on respiratory support, mobility, and developmental stimulation. Conduct comprehensive assessments to identify developmental delays, movement disorders, and other conditions affecting pediatric patients, develop individualized treatment plans to address specific goals, outcomes, and interventions, provide evidence-based physiotherapy interventions, including exercises, manual therapy, and education, to promote optimal development, function, and mobility starting from developmental delays to neuro muscular problems as well as in oncology and palliative care. Collaborate and Communicate and work with interdisciplinary teams, including pediatricians, occupational therapists, speech therapists, and families, to ensure comprehensive care and educate families, caregivers, and healthcare professionals on pediatric physiotherapy principles, interventions, and strategies.

8. **Disaster management Teams:** Physiotherapists play a crucial role in disaster management, providing essential services to affected individuals and communities. Their scope of practice would include providing immediate physiotherapy interventions in emergency settings, such as triage, first aid, and stabilization of injuries, conducting rapid assessments to identify individuals with physiotherapy needs, prioritizing those with life-threatening or limb-threatening conditions, providing physiotherapy interventions in acute care settings, such as hospitals, clinics, or temporary medical facilities.Designing and implementing rehabilitation programs to promote recovery, functional mobility, and independence in affected individuals and collaborating with community organizations, NGOs, and government agencies to provide physiotherapy services, education, and support to affected communities would also be handled efficiently by them. Interventions related to managing acute injuries, such as fractures, soft tissue injuries, and amputations, promoting wound healing, prevent complications, and manage pain, implementing pain management strategies, such as exercise, manual therapy, and education, to alleviate pain and discomfort, promoting functional mobility, strength, and independence in individuals, offering emotional support, counseling, and stress management techniques to individuals and communities affected by disasters and educating individuals and communities on disaster preparedness, injury prevention, and healthy lifestyle practices.

9. **Preventive Physiotherapy Care in IT Industry:** Physiotherapists play a crucial role in preventive care in the IT industry, helping to mitigate the risks associated with sedentary work and promoting overall well-being and promote a healthy lifestyle by employee education and working towards injury prevention. Interventions related to posture and body mechanics for health screening, physical fitness and those for mental health for a productive work environment in the IT industry.

10. **Role of Physiotherapy in Geriatric Health :** Physiotherapy plays a vital role in promoting healthy aging and addressing the unique needs of older adults in geriatric health. The scope of physiotherapy in geriatrics encompasses a wide range of interventions aimed at preventing, diagnosing, and managing age-related conditions, such as osteoporosis, arthritis, balance disorders, and cognitive impairment. Physiotherapists work with older adults to maintain functional independence, mobility, and quality of life through exercises, education, and lifestyle modifications. Interventions may include fall prevention strategies, balance and gait training, strengthening and flexibility exercises, pain management, and education on proper body mechanics and posture. Additionally, physiotherapists may address age-related issues such as incontinence, dementia, and polypharmacy, and collaborate with other healthcare professionals to provide comprehensive care. By addressing the physical, cognitive, and emotional needs of older adults, physiotherapy can further significantly impact geriatric health outcomes, enabling older adults, a growing category of population, to live healthier, more independent, and fulfilling lives.

11. **Role of Physiotherapy in Oncology and Cancer Survivors:** Scope of Physiotherapy in the management of cancer patients and survivors, encompasses diagnosis to survivorship by addressing the physical, emotional, and functional challenges associated with cancer diagnosis, treatment, and survivorship. The scope of physiotherapy in oncology and cancer survivorship encompasses a wide range of interventions, including pre-operative exercise programs, management of cancer-related fatigue, pain, and lymphedema, and rehabilitation programs to restore function, mobility, and independence. Physiotherapists also provide education on proper body mechanics, posture, and movement techniques, pain management strategies, and lymphedema management. Additionally, they offer respiratory therapy, psychosocial support, and counseling to enhance coping skills and psychological well-being. By providing these interventions, physiotherapy has shown to improve physical function, mobility, and independence, enhance quality of life and overall well-being, reduce cancer-related fatigue, pain, and lymphedema, and improve survivorship and reduce the risk of cancer recurrence.

12. **Role of Physiotherapy in Indian Defense Services:** Physiotherapy plays a vital role in the Indian Defense Services, contributing to the health, fitness, and well-being of military personnel. The scope of physiotherapy in the Indian Defense Services encompasses a wide range of interventions, including injury prevention and management, rehabilitation and recovery, fitness and conditioning, and ergonomic and workplace design. Physiotherapists work in various settings, including military hospitals, rehabilitation centers, and field hospitals, to provide care to military personnel. Interventions may include exercises, manual therapy, education, and pain management to address musculoskeletal injuries, cardiovascular conditions, and neurological disorders. Additionally, physiotherapists play a crucial role in promoting health and wellness, conducting research, and developing policies to enhance the overall health and fitness of military personnel. By providing these interventions, physiotherapy can significantly impact the health, fitness, and readiness of military personnel, ultimately contributing to the effectiveness and success of the Indian Defense Services.

13. **Role of Physiotherapy in Emergency Care and ICUs:** Physiotherapy plays a crucial role in Emergency Care and Intensive Care Units (ICUs), addressing the complex needs of critically ill patients. The scope of physiotherapy in Emergency Care and ICUs encompasses various areas, including respiratory care, cardiovascular management, neurological rehabilitation, and musculoskeletal interventions. Physiotherapists work collaboratively with healthcare teams to provide early mobilization, mechanical ventilation management, pain management, and family-centered care. By providing these interventions, physiotherapists have significantly impacted patient outcomes, reducing morbidity, mortality, and healthcare costs in Emergency Care and ICUs.

14. **Role of Physiotherapy in Preventive Care in Schools and Colleges:** Physiotherapists in schools and colleges work to promote physical health, well-being, and inclusion for students with physical disabilities, injuries, or chronic conditions. Their role involves assessing and identifying students' physical therapy needs, developing and implementing individualized physical therapy plans, sports training needs, poviding direct physical therapy interventions, such as exercises, manual therapy, and education, collaborating with teachers, parents, and other healthcare professionals to support student care and sports related needs and preventing and addressing injuries to return to safe play, promoting inclusive physical education and play opportunities for students with disabilities. Thus, addressing students' academic and functional goals and overall health of the future generation.

15. **Role of Physiotherapy as Research Scientists:** Presently physiotherapists are playing a crucial role in advancing the field of health care through rigorous scientific inquiry. Their scope involves designing, conducting, and disseminating research studies that investigate the efficacy, effectiveness, and mechanisms of multidisciplinary health interventions. This development and testing of novel treatments, of examining the underlying physiological and psychological mechanisms of health care, and exploring the impact of physiotherapy on healthcare outcomes and policy can be enhanced further by involvement of funding agencies, for direct collaboration with interdisciplinary teams, and communicating research findings through publications, presentations, and knowledge translation activities. Ultimately the goal is to generate high-quality all-inclusive evidence that keeps the health care professionals and community informed and improves the health and well-being of individuals and communities.

16. **Role of Physiotherapy in Hospital Administrative Services:** Physiotherapist having the basic understanding of health care and need of resources, work with hospital administrators to develop and manage budgets, personnel, and resources, and to evaluate the effectiveness of healthcare programs and services.

17. **Role of Physiotherapy in Space and Oceanography:** By addressing the unique challenges faced in the field of Space and Oceanography by astronauts, cosmonauts, and deep-sea divers, physiotherapists play a vital role in ensuring the health, safety, and performance of astronauts, cosmonauts, and deep-sea divers in extreme environments. The scope extends from pre-preparation to maintain muscle health, bone density, and cardiovascular and neuro-muscular fitness, also to mitigate the effects of microgravity or decompression on the body. Physiotherapists can collaborate with engineers to design space suits that minimize the risk of injury and optimize mobility and also to design submarines and underwater habitats that promote crew comfort, safety, and productivity.

18. **Role of Physiotherapy in Indian Administrative Services:** Physiotherapists can contribute in Administrative Services (IAS) by providing expertise in healthcare policies, planning, and management. As an IAS official a physiotherapist can work to develop and implement policies and programs that promote healthcare access, equity, and quality. They can also provide technical assistance and guidance on healthcare initiatives, such as the National Health Mission, the National Rural Health Mission, and the Ayushman Bharat Yojana. Additionally, physiotherapists can work with IAS officers to develop and manage budgets, personnel, and resources, and to evaluate the effectiveness of healthcare programs and services.

19. **Role of Physiotherapy as Insurance Team Consultants and Advisors :** As Insurance Team Consultants and Advisors, physiotherapists play a crucial role in policy review and development, claim processing and management, provider network development, education and training to company staff, healthcare providers, and policyholders on the benefits and coverage of the services. They also involve in data analysis and research to work on both mutual cost effectiveness and health benefits with stakeholder engagement by involving and collaborating with healthcare providers, insurance companies, and government agencies.

8.2. Extended Scope Physiotherapy Practice

Extended Scope Physiotherapists or ESPs, are advanced physiotherapists with many years of clinical practice, who work beyond the recognised scope of physiotherapy practice.

1. **Perform musculoskeletal ultrasound scanning**

   We have a number of extended scope physiotherapists who are trained to perform diagnostic ultrasound. If from your assessment an Ultrasound is required these will either be ordered, or most commonly performed as part of your assessment. This allows a time efficient functional and postural investigation to be undertaken with the results explained to you on the same day

2. **Injection Therapy**

   Many of our extended scope physiotherapists have completed training to allow them to administer injections that in some cases has been shown to provide pain relief for a variety of joints and musculoskeletal problems

3. **Physiotherapists as a part of Pain Management Programme (PMP)**

   A long term programme brings together the experiences of patients with persistent pain and the expertise of specialist pain clinicians, including occupational therapists, physiotherapists, clinical psychologists and nurses. The group manages persistent pain to achieve a life of quality despite their pain.

4. **Intra Muscular Dry Needling Therapy**
5. **Manual Therapy (Mulligan / Maitland / McKenzie/ Cyriax)**
6. **Tapping Techniques**
7. **Aquatic Therapy**
8. **Fascia Therapy**
9. **Ball / Band Therapy**
10. **Chiropractics / Osteopathy**

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ANNEXURE 1
LOGBOOK PROFORMA

Institute's Name

Logo of the institute

P.G. LOG BOOK

DEPARTMENT OF PHYSIOTHERAPY

AIMS AND OBJECTIVES OF THE DEPARTMENT

Provide quality care to the patient; Provide care on agreed and established clinical standards; Communicate clearly and effectively with patients and careers; Treat patients with respect; Work as effective members of the health care team. (Model)

SCOPE OF THE POSTGRADUATE COURSE

Critically evaluate approaches to Physiotherapy care and increase the practical skill in chosen areas. Gain an understanding of clinical audit in applied Physiotherapy and to develop the ability to initiate change and lead in the development of their profession through research. To upgrade their communicating skills and develop their ability as life-long learners. (Model)

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STUDENT'S PROFILE

NAME :

ADDRESS :

TELEPHONE NO. :

EMAIL ADDRESS :

EDUCATIONAL QUALIFICATION :

QUALIFICATION	INSTITUTE	UNIVERSITY	YEAR OF PASSING	PERCENTAGE
BPT				

ACADEMIC ACHIEVEMENTS :

EXPERIENCE :

DESIGNATION	DEPARTMENT	INSTITUTION	FROM	TO

COURSE JOINED:

DATE OF JOINING:

DATE OF COMPLETION:

I N D E X

SL. NO.	ACADEMIC ACTIVITIES	TOTAL	
1	DISSERTATION PRESENTATION		
2	SEMINARS	Minimum 25	
3	CLINICAL (CASE) PRESENTATION	Minimum 20	
4	SPECIAL CLINICS	Minimum 10	
5	JOURNAL PRESENTATION	Minimum 12	
6	PEDAGOGY (U.G. CLASSES TAKEN)	Minimum 20	
7	INTER DEPARTMENTAL MEETING	Minimum 10	
8	COMMUNITY WORK / CAMP / FIELD VISITS	Minimum 6	
9	CONTINUING PHYSIOTHERAPY EUDCATION / CONFERENCE ATTENDED	Minimum 2	
10	PAPER PRESENTED	Minimum 1	

Academic activities will be evaluated by using the following Grade:

0- Poor; 1- Fair; 2- Average; 3- Good; 4- Very Good

SL. NO.	PROCEDURES	OBSERVED	PERFORMED	TOTAL
1	MUSCULOSKELETAL ASSESSMENT			
2	NEUROLOGICAL ASSESSMENT			
3	CARDIO PULMONARY ASSESSMENT			
4	PAEDIATRIC ASSESSMENT			
5	OTHER ASSESSMENTS			
6	HAND EVALUATION			
7	EMG / NCV			
8	PFT			
9	EXERCISE TESTING			
10	GAIT ANALYSIS			

1.THESIS/DISSERTATION

Submission of Topic : (2nd month after joining)

Initial Presentation : (2nd month after joining)

Review of Literature (Part 1) : (6 month after joining)

Final Submission : (6 month before the university exam)

TITLE :

GUIDE :

CO-GUIDE :

I.THESIS PROGRESS REVIEW

Date															
i.Collection of Case/Material															
ii.Periodic consultation with Guide															
iii.Any other finding															
Signature Guide															
Signature HOD															
Signature DEAN															

CHECKLIST FOR DISSERTATION PRESENTATION

(To be evaluated by the Head of Dept. and Professor other than Guide)

II.Initial presentation							
Date	**iv.Selection of Topic**	**v.Preliminary review of literature**	**vi.Discussion with Guide**	**vii.Quality of Protocol**	**viii.Overall Interest shown**	**ix.Grade**	**Signature**
III.Final Presentation							
Date	**x.Periodic progress schedule maintained**	**xi.Quality of review of literature**	**xii.Statistical analysis**	**xiii.Discussion and Summary**	**xiv.Overall Interest shown**	**xv.Grade**	**Signature**

2.SEMINARS

Minimum requirements: 25

Checklist for evaluation of Seminar:

No.	Date	Topic	Whether other relevant publications consulted	Whether cross references have been consulted	Completeness of preparation	Clarity of presentations	Under-standing of subject	Ability of answer questions	Time scheduling	Appropriate use of Audio-Visual aids	Overall performance	Any other observations	Total Score

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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2.SEMINARS

Minimum requirements: 25

Checklist for evaluation of Seminar:

No.	Date	Topic	Whether other relevant publications consulted	Whether cross references have been consulted	Completeness of preparation	Clarity of presentations	Under-standing of subject	Ability of answer questions	Time scheduling	Appropriate use of Audio-Visual aids	Overall performance	Any other observations	Total Score

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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3. CLINICAL CASE PRESENTATION

Minimum requirements: 30

Evaluation form for clinical case presentation:

No.	Date	Diagnosis	Completeness of History	Whether all relevant points elicited	Clarity of presentation	Logical order	Accuracy of general physical examination	Whether all physical signs have been assessed	Diagnosis-Whether it follows logically from history & findings	use of outcome measures	Investigations consulted	Problems identified (ICF)	Short term goals

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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4. SPECIAL CLINIC CASE PRESENTATION

Minimum requirements: 10

Evaluation form for clinical case presentation:

No.	Date	Diagnosis	Completeness of History	Whether all relevant points elicited	Clarity of presentation	Logical order	Accuracy of general physical examination	Whether all physical signs have been assessed	Diagnosis-Whether it follows logically from history & findings	use of outcome measures	Investigations consulted	Problems identified (ICF)	Short term goals

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

5. JOURNAL PRESENTATIONS

Minimum requirement: 12

Evaluation form for Journal Presentation

No.	Date	Topic/Journal	Article chosen was Appropriate	Extent of understanding the scope & objectives of the paper by the candidate	Whether cross references have been consulted	Whether other relevant publications consulted	Ability to respond to questions on the paper/subject	Audio-Visual aids used	Critical Appraisal	Clarity of presentation	Any other observation	Total Score

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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5. JOURNAL PRESENTATIONS

Minimum requirement: 12

Evaluation form for Journal Presentation

No.	Date	Topic/Journal	Article chosen was Appropriate	Extent of understanding the scope & objectives of the paper by the candidate	Whether cross references have been consulted	Whether other relevant publications consulted	Ability to respond to questions on the paper/subject	Audio-Visual aids used	Critical Appraisal	Clarity of presentation	Any other observation	Total Score

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

6. PEDAGOGY

Minimum requirement: 20

Evaluation form for Teaching skills:

No.	Date	Topic	Introduction of topic	Speaking style	Use of AV Aids	Summary	Audience Interest	Asking Questions	Answering Questions	Grade	Staff Signature

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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6.PEDAGOGY

Minimum requirement: 20

Evaluation form for Teaching skills:

No.	Date	Topic	Introduction of topic	Speaking style	Use of AV Aids	Summary	Audience Interest	Asking Questions	Answering Questions	Grade	Staff Signature

0 - Poor; 1 - Fair; 2 - Average; 3 - Good; 4 - Very Good

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6.PEDAGOGY (BEDSIDE CLINICS)

Sl.No.	Date	Case	Grade	Staff Signature

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7. INTER DEPARTMENTAL MEETING

Minimum: 10

SL.NO.	DATE	DEPARTMENT	CASE	GRADE	SIGNATURE

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9. ATTENDENCE AT OTHER ACADEMIC ACTIVITIES

CME/WORKSHOP/CONFERENCE

MINIMUM : CONFERENCE : 1

CME (STATE LEVEL) : 2

DATE	NATURE OF ACTIVITY	ORGANISED BY / PLACE

10.SCIENTIFIC PAPERS PUBLISHED/PRESENTED:

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Minimum score requirement for various teaching learning activities:

SL.NO.	TEACHING & LEARNING ACTIVITIES	REQUIRED
1	DISSERTATION THESIS	
2	SEMINARS	25
3	CLINICAL PRESENTATION	30
4	SPECIAL CLINICS	10
5	JOURNAL CLUB	12
6	INTER DEPARTMENTAL MEETING	10
7	PEDAGOGY (U.G. CLASSES TAKEN)	20
8	COMMUNITY WORK / CAMP / FIELD VISITS	6
9	CONTINUING PHYSIOTHERAPY EDUCATION/CONFERENCE ATTENDED	2
10	PAPER PRESENTED	1

SL.NO.	PROCEDURES	Specialty	OTHERS
1	MUSCULOSKELETAL ASSESSMENT	40	20
2	NEUROLOGICAL ASSESSMENT	40	20
3	CARDIO PULMONARY ASSESSMENT	40	20
4	PAEDIATRIC ASSESSMENT	25	15
5	CBR ASSESSMENT	40	20
6	OTHER ASSESSMENTS		10
7	EMG / NCV	10 (O)	5(O)
8	PFT	20	10(O)
9	EXERCISE TESTING	15 (O)	5(O)
10	GAIT ANALYSIS	15	10(O)

PROCEDURES PERFORMED

SL.NO.	DATE	NAME OF THE PATIENT	AGE	SEX	PROCEDURE	SIGNATURE

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ANNEXURE 2
MINIMUM STANDARD REQUIREMENT FOR B.P.T.

ANNEXURE- 2

9. Minimum Standard Requirement for Bachelor in Physiotherapy (B.P.T) program (Maximum intake of 50/100 students)

9.0. **The establishment of a Physiotherapy college–**

9.0.1. 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 Central/ State Government/Union territory;
2. A University and Deemed to be University, or a private institution affiliated with a Government university;
3. An autonomous body of the Central or State Government;
4. A society registered under the Societies Registration Act, 1860 (21 of 1860) or corresponding Acts in States;
5. A public or charitable trust registered under the Trust Act, 1882 (2 of 1882);
6. Companies registered under Company Act may also be allowed to open Physiotherapy colleges.

9.0.2. New Physiotherapy College/institute can be established preferably in colocation with a medical college recognized by the National Medical Commission (NMC). **Notwithstanding, a new Physiotherapy College needs to fulfill the entire essential requirement as prescribed by the norms in this Regulation.** The new Physiotherapy College may share common facilities, faculties and infrastructure with the medical college where feasible/applicable

9.0.3. Note: All existing physiotherapy colleges/institute or a new physiotherapy college will impart physiotherapy education provided that **conditions mentioned in Annexure -2** are fulfilled.

9.1. **Infrastructural, Functional & Equipment and human resource Requirements:**

Note: The Lab Infrastructure is given for average 50 Student intake, if Higher no. of seats [i.e. 100 intakes] 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.

9.1.1. **LAND AND BUILDING** –

1. Minimum 10 acres land is required for Physiotherapy College.
    i. If the college is in the premises of NMC permitted/ recognized medical college, no separate land is required. Besides, **norms for independent building for Physiotherapy College must be fulfilled** as per the requirement mentioned below.
    ii. In all other cases, the applicant must provide the land details on which the institution will be established for providing Physiotherapy education. The land should be in the name of society/ trust/company applying for the same (sale deed/lease/gift deed etc.).
2. The applicant Institution / Trust should have a separate facility for clinical training as per the curriculum prescribed by the NCAHP from time to time.
3. Adequate parking space and recreational area or open space for students must be ensured as per applicable Government norms.
4. Adequate space for out-patient Physiotherapy department, various laboratories, office space, class rooms, hostel and other ancillary facilities must be available as prescribed by the NCAHP.
5. Minimum exclusive built-up area must be 35,000 sq.ft.
6. Building should be barrier free accessible to persons with disability and as per NBCI guidelines (National Building Code of India).
7. 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.
8. Building must have requisite clearances from the respective civic and administrative authorities like- i. Fire NOC, ii. structural stability certificate, iii. land use certificates etc.
9. Building must have CCTV camera for surveillance for every area of common use as can be prescribed.
10. Biometric facility for students and staff, faculty attendance record/documentation

9.1.2. **PHYSIOTHERAPY Department/ O.P.D:**

1. 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, among others, should be available at the college premises.
2. Every Physiotherapy college should have its own OPD for adequate training of the students. Student/ patient ratio of 1:5 should be maintained in the hospital.
3. A stand-alone Physiotherapy college can sign MOUs with up to five different hospitals having at least 50 beds each. **This MoU arrangement for OPD would be allowed for a maximum period of five years only**, during which the college must establish its own OPD.
4. An out-patient physiotherapy department at the tie-up facility cannot be considered as an independent physiotherapy OPD/ unit of the college.
5. Besides the physiotherapy OPD at the campus, the institute should also start a community / extension centre in nearby rural /semi urban area.

9.1.3. **HOSPITAL / HOSPITAL ATTACHMENT –**

1. If the college is in the premises of NMC permitted/recognized Medical College, there is no requirement for attachment of any other hospital.
2. In all other cases, Proof of availability of 250 beds own/attached hospital (Government/Private) for clinical training of 50 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.

3. College can be affiliated to maximum five (05) hospitals having indoor and outdoor facility in the following specialties to have cumulative /total 250 beds for clinical training of 50 students.

Sl. No.	Specialties/ Super specialties
1	Orthopedics/ musculoskeletal departments
2	Medicine including rheumatology, geriatrics and emergency medicine
3	Surgery including plastic surgery and burns
4	Gynecology and Obstetrics
5	Neurology/Neurosurgery
6	Pediatrics, pediatric surgery and neonatal ICUs
7	Respiratory medicine
8	Cardiology including critical care and cardiothoracic surgery
9	Oncology and Radiotherapy
Total bed strength = 250	

4. 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.

5. The affiliated hospital shall provide information regarding any MOU with other colleges, if any.

6. 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.

7. 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.

8. 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.

9.1.4. **Space allotment for an annual intake of 50 students of B.P.T.**

	Unit name	Requirement per unit (in sq. ft)	No. of Units	Total area required (In sq.ft.)
1.	Department Office	500	1	500
2.	Director/ Dean/ Principal/ HOD`s Office	300	1	300
3.	Professor's Office	200	2	400
4.	Associate Professor's office	100	4	400
5.	Assistant Professor's office	50	8	400
6.	Common room for Staff	500	1	500
7.	Room for visiting faculty	300	1	300
8.	Seminar room/ Mini Auditorium	1000	1	1000
9.	Conference Room	1500	1	1500
10.	Class Rooms with LCD projector/ smart class rooms with demonstration couches	1200	4	4800
11.	Students common room [Girls]	500	1	500
12.	Students common room [Boys]	500	1	500
13.	Library with Reading Room	2500	1	2500
14.	Discussions /Interaction room	200	1	200
15.	Out-door Physiotherapy Department	2500	1	2500
16.	Therapeutic exercise Room	1000	1	1000
Laboratories:				
17.	Anatomy Laboratory	1200	1	1200
18.	Physiology Laboratory	1200	1	1200
Departments:				
19.	Exercise Therapy/ Therapeutic Exercise/ Kinesiotherapy Department	1200	1	1200
20.	Electrotherapy & Electro- diagnosis Department	1200	1	1200
21.	Department of Musculoskeletal & Sports Physiotherapy	1200	1	1200
22.	Department of Neurophysiotherapy	1200	1	1200

Unit name	Requirement per unit (in sq. ft)	No. of Units	Total area required (In sq.ft.)
23. Department of Cardio-respiratory Physiotherapy	1200	1	1200
24. Department of Community Physiotherapy	1200	1	1200
25. Department of sports physiotherapy, exercise fitness & analysis	1200	1	1200
Other Facilities:			
26. Hostel for Girls	Separate / shared with other institutions of the same management	1	
27. Hostel for Boys		1	
28. Play ground out door			Minimum 3000
29. Library			

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

9.1.5. **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:

3. Department of Musculoskeletal Sciences Physiotherapy
4. Department of Neurosciences Physiotherapy
5. Department of Cardio-Pulmonary Physiotherapy

6. Department of Physiotherapy in Community Health
7. Department of Paediatrics
8. Department of sports physiotherapy
9. **Other Facilities:**
    i. Ladies common room with attached wash area
    ii. Boys common room with attached wash area
    iii. Canteen facility for students and staff
    iv. Water Cooler/safe drinking water facility
    v. Internet facility inside campus (Office/Principal Room/Staff Room)
    vi. Cycle \ Motorcycle \ Car Parking

Note that as per 8.1.: The Lab Infrastructure is given for average 50 Student intake, if Higher no. of seats [i.e. 100 intakes] 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.

9.1.6. **Laboratories (equipment for Fifty students)**

1. **Anatomy**

S. No.	Components	Laboratory
1.	Dissection facility	Minimum 2 cadavers
2.	Disarticulated bone set including spine set	Minimum 5 sets
3.	Specimen/model for soft parts [heart, lung, brain, spinal cord, lower limb, upper limb, spine, GI system, male and female urogenital system]	Minimum 2 sets
4.	Anatomy Software and Virtual Anatomy Models computer with internet connection along with multimedia projector and screen. PC should be installed with software and virtual anatomy models for teaching musculoskeletal and neurological anatomy	Updated version of software

2. **Physiology**

S. No.	Components	Laboratory
1.	Microscope oil immersion with single and double demonstration eye piece	Ten
2.	Westergren's pipette for E.S.R. on stand (with space pipette)	Minimum Fifty
3.	Wintrobe's pipette for ESR and PCV with stand	Minimum Fifty
4.	Hemoglobin-meter	Minimum Fifty
5.	Hemocytometer	Five
6.	Tuning fork time marker	Two
7.	Sphygmomanometer (mercury and digital)	Ten each
8.	Stethoscopes	Ten
9.	Stethoscopes for demonstration with multiple earpieces (desirable)	Five
10.	Polygraphs	One
11.	Spirometer	Twenty
12.	Gas analysis apparatus. Halden's student type	One
13.	Van Slyke's apparatus manometric	One
14.	Shenington Starling kymograph (electrically driven)	Two
15.	Gas analyser automatic for CO2. 02, N2	One
16.	Basal metabolism apparatus	One
17.	Mosso's Ergograph	Five
18.	Clinical thermometer	Twenty
19.	Compass aesthesiometer	One
20.	Thermo-aesthesiometer	One
21.	Algometer	One
22.	Knee hammer	Twenty five
23.	Bicycle Ergometer	Two
24.	Schematic eye	One
25.	Newtons color wheel	One
26.	Tuning fork to test hearing 32-10000 cps(sets-100.256.512Hz)	One
27.	Dynamometer	One
28.	Perimeter with charts (Lister"s)	One
29.	Color perception lantern Edridge green	One

3. **Exercise therapy/ Kinesiotherapy/ Gymnasium**

S. No.	Name of Instruments	Laboratory	OPD
1.	Parallel bar	One	One
2.	Wall bar	One	One
3.	Suspension frame with apparatus	Four	One
4.	Ergocycles	One	One
5.	Blood pressure apparatus	Ten	Two
6.	Large full size mirrors	one	One
7.	Wrist roller/exercise	One	One
8.	Stepper	One	One
9.	Shoulder wheel	One	One
10.	Walker with adjustable heights	Five	Two
11.	Walker with adjustable heights with castor	Two	One
12.	Axillary and elbow crutches (adjustable)	10 Pairs each	2 Pairs each
13.	Tripod stick, quadripod adjustable	Ten each	Two each
14.	Aluminum sticks	Ten	Two
15.	Vestibular balls – 26”, 30”, 34”	Two each	One each
16.	Delorme shoes with weights	Six Pairs	One Pair
17.	Staircase and slope	One	One
18.	Tilt table	One	One
19.	Goniometers – 180, 360	Ten each	One each
20.	Digital goniometres	Five	One
21.	Inclinometer	Five	One
22.	Spinal goniometer	One	One
23.	Reflex Hammers	Ten	One
24.	Quadriceps table with weights	One	One
25.	Equilibrium board both adult and pediatric	One each	One each
26.	Exercise mats	Six	Four
27.	Dumbbells, weight cuffs, sandbags, springs of different weights and strengths	Four sets each	One set each
28.	Rope & Pulley set	Twenty	Five
29.	Progressive resistance station /Multi- Gym	One	One

S. No.	Name of Instruments	Laboratory	OPD
30.	Bolster 3 sizes	One each	One each
31.	Rowing machine	One	One
32.	Ankle exerciser	One	One
33.	Wedge	Two	One
34.	Medicine balls	Ten	Three
35.	Resistive bands Different colors	Ten each	Five each
36.	Finger ladder	One	One
37.	Skates	Six	Two
38.	Pedo cycle	One	One
39.	Wheel chairs with detachable arm rest	Five	Two
40.	Wooden Plinth	Six	Three
	b) Exercise therapy & Kinesiotherapy (For 3rd & 4th Year):		
41.	Hand dynamo meter	One	One
42.	Skin fold caliper	One	One
43.	Body composition analyzer	One	
44.	Weighing scale	One	One
45.	Stadiometer (Height Measuring scale)	One	One
46.	Computerized Treadmill	One	One
47.	Sensory assessment kit)	One	One
48.	Pain assessment instrument (PPT-Algometer	Four	One
49.	Hydrotherapy Unit	One	One

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

S. No.	Name Of Instruments	Laboratory	OPD
1.	Short wave diathermy	Four	Two
2.	Microwave Diathermy	One	One
3.	Pulse Diathermy (PEME)	Two	One
4.	Diagnostic stimulator	Four	Two
5.	Ultrasound therapy unit 1 &3 MHz	Four	Two
6.	Paraffin wax bath unit	Two	One
7.	Infrared lamp- Luminous & non-luminous	Four	Two
8.	Cold pack unit / refrigerator with cryo pack of different sizes	One	One
9.	Hot pack unit/ hydro collator unit with 6 packs	Two	One
10.	Laser Unit	Three	One
11.	Interferential Theory Unit	Three	Two
12.	Trans Cutaneous Nerve Stimulator (TENS)	Three	Two
	Electro Therapy & Electro diagnosis Lab (For 3rd & 4th Year)		
13.	E.M.G./N.C.V	One	One
14.	Diagnostic stimulator	Two	Two
15.	EMG Biofeedback unit	One	One
16.	Extracorporeal shock wave therapy	One	One
17.	Combination therapy	One	One

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5. **Department of Musculoskeletal & Sports Physiotherapy**

S. No.	Name Of Instruments	Lab [min]	OPD [min]
1.	Wheel chair with detachable arm rest	1	1
2.	Cambered wheel chair	1	1
3.	Crutch axillary	5	5
4.	elbow crutch	5	5
5.	Walking stick with adjustable height	5	5
6.	Tripod /terapod walking stick	5	5
7.	Set of orthosis and splints for upper limb	10	10
8.	Set of orthosis and splints for lower limb	10	10
9.	Set of orthosis and splints for spine	10	10
10.	Treatment couch	10	10
11.	Pillows	10	10
12.	Tilt table	1	1
13.	Articulated bone set	1	1
14.	articulated spine model	3	3
15.	balance board	1	2

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6. **Department of Neuro - Physiotherapy**

S. No.	Balance assessment & training equipment	Lab [min]	OPD [min]
1.	Suspension frame	1	1
2.	Wheel chair	1	2
3.	Parallel bar	1	1
4.	Stair case	1	1
5.	Sensory testing kit monofilament	1	1
6.	Reflex Hammer	1	2
7.	Balance board	1	1
8.	Pillows	10	10
9.	Transfer board	1	1
10.	Wheel chair	1	2
11.	Crutches	10	10
12.	Mat	5	5
13.	Gym ball	2	5
14.	bolsters	2	5
15.	Wedge	5	5

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7. **Department of Cardio-respiratory Physiotherapy**

S. No.	Balance assessment & training equipment	Lab [min]	OPD [min]
1.	Hand held Doppler and venogram	One	1
2.	Motorized Treadmill with inclination control	One	1
3.	Cardio-pulmonary exercise testing Unit	One	1
4.	Nebulizer	Four	One
5.	Peak Flow Meter	One	One
6.	Inspiratory Muscle trainer	Five	Five
7.	Portable Oxygen Cylinder with accessories	One	One
8.	Non invasive ventilation (BiPAP, CPAP, Auto PAP)	One	1
9.	Ambu bag	Two	1
10.	Mechanical vibrator	Four	1
11.	Arm Ergometer	One	1
12.	Suction Devices- Electronic and foot operated	Two each	One each
13.	Pulmonary Function Testing (PFT) System	One	1
14.	Endotracheal tube, Tracheostomy tube of different sizes	One each	
15.	Suction catheter of different sizes	5 each	2 each
16.	Couch for postural drainer	Four	2
17.	Pillows	Ten	10
18.	Pedometer	One	1
19.	Pulmonary function test Machine	One	1
20.	Incentive Spirometer (Volume and Flow each)	Three each	Three each

8. **Department of Community Physiotherapy**

S. No.	Balance assessment & training equipment	Lab [min]	OPD [min]
1.	Weighing machine	Two	1
2.	Baby weighing machine	Two	1
3.	Skin fold caliper	4 sets	5
4.	Goniometer	4 sets	5
5.	Height measuring stand	Two	5
6.	Vehicle for transport of students / interns and staff to community visits	One	
7.	Multimedia projector with screen	Two	1
8.	Portable Public address system	Two	1
9.	First aid kit	Four sets	4
10.	Body Composition Analyzer	Two	2
11.	Portable couch	Four	4
12.	Portable table	Four	4
13.	Portable chair	Four	4

9. **Skill lab**

SI. No.	Balance assessment & training equipment	Lab [min]
1	Couch	Ten
2	Mannequin for CPR	One
3	Bandages tapes	Five sets
4	Therabands	5 sets
5	Bed having facility for propping up patient	Two
6	Spine board	Two
7	Bolsters	Four
8	Mat	Four
9	Gym ball	1 set

10. **Physiotherapy Out Patient Department (PT-OPD)**

1. Infrastructure requirements

i. Reception area

ii. Waiting hall with adequate sitting arrangements

iii. Consultation rooms

iv. Ancillary area: space for storage of records, reagents, consumables, stationary etc including eating area for staff shall be available in accordance with the workload

v. Electrotherapy unit: six chambers for different modalities

vi. Separate space for Cryotherapy unit, Wax Bath and Hydrocollator

vii. Two consultation chambers with examination couches

viii. Exercise Therapy unit

ix. Minimum one consultation room (8 ftX8 ft at least),

x. Treatment rooms or cabins (three of 10ftX10ft each)

xi. Gymnasium for exercise training (25 ft X 20 ft)

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

xiii. Hydrotherapy/ aquatherapy unit: 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.

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

xv. Furniture and Fixtures for all the department (as per need)

a. Table

b. Chairs

c. Patient examination revolving stool

d. Examination Table or couch

e. Blind Screens/ curtains

f. Step-up stool

g. Storage Cabinet for records etc.

h. Biomedical Waste disposal bins

xvi. List of Essential Equipment

a. Stethoscope - 1
b. Thermometer Digital - 1
c. Torch (flash lights) - 1
d. Sphygmomanometer (B.P. Apparatus) Digital - 1
e. Weighing machine - 1

xvii. Fire extinguisher (as per the norms)

9.1.7. **Human Resource Requirements**

1. **Physiotherapy FACULTY [core]:** Minimum basic qualification and teaching experience required for teachers

SI No.	DESIGNATION	QUALIFICATION & EXPERIENCE	PUBLICATION	PAY SCALE
i.	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	Essential 02 publications [in total]	As per UGC norms
ii	Associate Professor	Master in Physiotherapy (M.P.T./ M.P.Th. /M.Sc. P.T.) with Five years total experience as Assistant Professor (out of which minimum 2 yrs as Senior AP preferabely) Ph. D. in any discipline in Physiotherapy recognized by U.G.C.	Essential 05 publications [in total]	As per UGC norms
iii	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
iv	Dean	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
v	Tutors/ Demonstrator (non-academic position)	BPT Degree of Indian University or an equivalent qualification with at least two year experience [Full time Regular mode only]		

a. **Superannuation age for teaching faculty shall be 65 years**

b. 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.

c. Existing Experienced teachers having more than 10 years of teaching experience may be considered for promotion to Assistant Professor, subject to fulfillment of essential qualification of Assistant Professor.

d. 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 Dean / Director.

e. Notwithstanding anything contained in these Regulations, any appointment made prior to this recommendation of the Commission shall be protected. Existing faculty in associate professors and professors designation shall be given a time frame of five academic years to pursue a PhD qualification from the notification.

f. The post of Demonstrator/tutor will be considered as non-academic teaching faculty positions.

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

a. Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology Orthopedics, General Medicine, General Surgery, Neurology, Neurosurgery, Prosthetics and Orthotics, Pediatrics, Geriatrics, Obstetrics and gynecology, Cardiology, Cardiac surgery, Plastic surgery- MD/MS/ M.Sc./ PhD/ DM/ M.Ch. in respective specialty.

b. Psychology &Sociology, Biostatistics – post graduate with 55% marks in respective subject

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.

3. **Staffing Pattern – Teaching & Non-Teaching Staff**

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

	50 seats	51-100 Seats
iii. Before the start of 1st year of BPT course	Professor – 1, Assoc. Prof. –2, Asst. Prof. – 3, Demonstrator –6	Professor-1, Assoc. Prof.-2, Asst. Prof.-4, Demonstrator-10
iv. Before the start of 2nd year of BPT course	Professor – 1, Assoc. Prof. –2, Asst. Prof. – 5, Demonstrator –8	Professor – 2, Assoc. Prof. –3, Asst. Prof. – 8, Demonstrator –6
v. Before the start of 3rd year of BPT course	Professor – 2, Assoc. Prof. –3, Asst. Prof. – 5, Demonstrator –9	Professor – 3, Assoc. Prof. –5, Asst. Prof. – 10, Demonstrator –15
vi. Before the start of 4th year of BPT course	Professor – 2, Assoc. Prof. –4, Asst. Prof. – 6, Demonstrator –10	Professor – 4, Assoc. Prof. –8, Asst. Prof. – 12, Demonstrator –20

ii. **Minimum Teaching Workload of Faculty**:

a. Professor– 8 hrs. per week

b. Associate Professor – 12 hrs. per week

c. Assistant professor – 18 hrs. per week

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

iv. Non-teaching Staff for institution having fifty (50) seats

Sr. No	Post	Numbers
a.	Physiotherapists	6
b.	Librarian	1
c.	Asst. Librarian	1
d.	Office Superintendent	1
e.	Accountant	1
f.	Office Assistant Clerk/DEO	1
g.	Lab Attendants	8
h.	Peon/Sweepers/Cleaners	as per the requirement

ANNEXURE -3:

Minimum standard requirement for M.P.T.

10. Minimum Equipment requirements for MPT specialties:

10.0. Fully equipped Electrotherapy Lab, exercise therapy labs are mandatory for master of Physiotherapy programs.

10.1. For each postgraduation specialty of Physiotherapy (MPT) program fully equipped corresponding laboratory is mandatory.

1. **Neuro-Physiotherapy Laboratory [Minimum One Unit]:**

   i. Neuro-Exercise Unit-

   ii. 4 Channel EMG with nerve-conduction testing facility

   iii. Biofeedback unit with the facility to do quantitative analysis and therapy

   iv. Sensory integration kits

   v. Balance boards

   vi. Gait analyser-

   vii. Balance analyser and balance trainer

   viii. Functional Electrical Stimulator

   ix. Trancranial Magnetic stimulation device

   x. Transcranial Direct current stimulation device

   xi. Mirror therapy

   xii. Unweighing harness system with treadmill

   xiii. Tilt table

   xiv. Dynamometers

   xv. Gait belts

   xvi. Video camera and player (with jog shuttle facility) for movement analysis (desirable)

   xvii. Robotics for upper limb and lower limbs- Desirable

   xviii. Virtual / Augmented reality device (desirable)

2. **Musculoskeletal Physiotherapy Laboratory [Minimum One Unit]**

   i. Dynamometer – myometer

   ii. Electronic goniometry

   iii. Algometer

   iv. Hand Evaluation kit

   v. Biofeedback unit with facility EMG unit with integrated analysis software provided

   vi. Video camera and player (with jog shuttle facility) for movement analysis

   vii. Isokinetic Unit – desirable

   viii. Motion analysis

   ix. Continuous passive motion devices

   x. Shock wave unit

   xi. Spinal Decompression unit

   xii. Attachment with prosthetic orthotic unit

3. **Cardio-Pulmonary Laboratory-[Minimum One Unit]-**

   i. Treadmill / Bicycle Ergo meter with facility for TMT

   ii. Spiro meter Portable

   iii. Pulmonary function test unit

   iv. Suction apparatus

   v. Peak Flow meters

   vi. Pulse Oximeters

   vii. Mannequin for CPR training

   viii. Flutter

   ix. Fat fold caliper 6

   x. BiPAP/CPAP – desirable

   xi. Body Composition analyzer- desirable

   xii. Energy Consumption analyzer – desirable

   xiii. Couches pillows bed sheets chairs

4. **Pediatric physiotherapy Laboratory-[Minimum One Unit]**

   i. Well-equipped Play room

   ii. Sensory Integration Room

   iii. Swiss balls

   iv. Positioning devices

   v. Attachment to a CHC is a must, attachment to a pediatric cardio and ortho hospitals

   vi. Ball pool

   vii. Mannequin for pediatric CPR training

   viii. Audio-Visual room

   ix. Accessibility to a mobile Physiotherapy Unit is desirable Attachment with prosthetic orthotic unit

   x. Couches pillows bed sheets chairs

5. **Sports Physiotherapy Laboratory-[Minimum One Unit]**

   i. Fitness measurement instrumentation

   ii. Access to advanced sports center/gymnasium

   iii. Hydrotherapy pool for underwater treadmill /bicycle

   iv. Sauna bath

   v. Medicine ball/ Swiss balls Thera bands

   vi. Equipment for arthrometric measurements

   vii. Body composition analyzer

   viii. Mannequin for CPR training

   ix. Biofeedback unit with facility EMG unit with integrated analysis software provided

   x. Video camera and player (with jog shuttle facility) for movement analysis desirable

   xi. Isokinetic Unit – desirable

   xii. Equipment for Motion analysis – desirable

   xiii. Tie up with a recognized sports academy/ center

6. **Obstetrics and Gynecology Physiotherapy: [Minimum One Unit Each]**

   i. Mirror

   ii. Ultrasound machine

   iii. TENS

   iv. IFT

   v. Electrical stimulator with vaginal electrode

   vi. Perineometer

   vii. Vaginal cones with different weights

   viii. Pressure biofeedback

   ix. Medicine ball/ Swiss balls

   x. Dumbbells set/TheraBand's/Thera tubes

   xi. Weighing machine

   xii. Low mats/Chairs

7. **Oncological Physiotherapy [Minimum One Unit Each]**

   i. Pneumatic compression therapy unit with accessories for both upper and lower limbs (2)

   ii. EMG Bio feed back Unit (1)

   iii. Muscle stimulator (1)

   iv. Interferential Therapy Unit (1)

   v. Attachment with tertiary care oncological hospital.

8. Community Physiotherapy

   i. Attachment to a PHC is a must

   ii. Accessibility to a mobile Physiotherapy Unit

   iii. Basic Rehabilitation set up in college building.

10.2. Library:

1. 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/specialty. In addition, reference books,
2. Audio visual facility, Slide projector,
3. Computer, Internet facility is to be provided.

10.3. 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, pediatrics, 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.

10.4. Human resource requirement Teaching Faculty

1. **Staff Requirement (Faculty to student ratio)**

   Professor 1:3

   Assoc Prof 1:2

   Asst prof 1:2

2. Teaching Faculty per specialization for a minimum intake of 5 students per year (Total 10 students for the program):

   i. Professor 1

   ii. Associate professor 1

   iii. Assistant professor 2

3. Services of visiting faculty can be utilized, but these faculty members will not be counted in the PG teachers and they cannot register candidates

4. **Non teaching staff**

   i. Office superintendent/ assistant 1

   ii. Computer operator 1

   iii. Lab assistant / demonstrator - BPT 1

10.5. Essential Requirements for MPT Institution

All existing Physiotherapy colleges/ institute will continue to impart Physiotherapy education provided that following conditions are fulfilled: -

1. **Eligibility : Any government /Private/ Self Financing Educational Trust/Charitable Trust/Society/Company registered under the relevant Act; applicant will be eligible to apply.**

    a. College should be running BPT programme for last 5 years with atleast one batch of BPT students having graduated from the institute.

2. **Physical infrastructure**

    Whole campus should be accessible for persons with disabilities.

3. **Administrative Office Land and space requirement**

    i. **There shall be no separate land required for starting MPT course subject to fulfillment of eligibility criteria to start the MPT program. However, the essential requirements in terms of physical infrastructure, Manpower as given below must be furnished**

    a. Rooms for faculty [per specialty]

Professor	1
Associate professor	1
Assistant professor	2

    b. Common room for students

    c. Toilets for men

    d. Toilet for women

    e. Classroom - 02 rooms of 400 sq.ft. (each).

    f. 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 as mentioned in Annexure 2 and 3.

    g. Standalone MPT institute must have Exercise therapy/ Kinesiotherapy Lab and Electrotherapy Lab (with atleast one equipment of each category as mentioned for BPT Program)

ANNEXURE 4
CLINICAL FELLOWSHIP GUIDELINES

11. Annexure 4: Guidelines of clinical fellowship in Physiotherapy:

11.0. **Fellowship Program**:

1. Fellowship programs should be structured training in an academic institute or hospital setting, not leading to an award of postgraduate degree.
2. Any degree with title “fellow” fulfilling the criteria of post graduate degrees is excluded

11.1. The institutions need to follow these guidelines:

1. Program Requirements: By adhering to these guidelines, institutions can ensure their clinical fellowship programs meet the necessary standards for acknowledgement.

1. Duration: At least 12 months (by date).
2. Subject Affiliation: Only subjects or subspecialties stemming from the main specialty are considered.
3. Aims and Objectives: Relevant program guidelines should clearly state the program's aims, objectives, and expected outcomes after training.
4. Fellowship Committee and Faculties: Provide details (List the degree, current designation, work experience, and other relevant experiences of each faculty member should be clearly stated) of the committee and faculties involved to the commission, and ensure all faculties are registered.

2. Faculty: The minimum requirements for faculty for institutions offering clinical fellowship programs in Physiotherapy are

1. Eligible Qualification and Experience: (must be registered with the National Commission for Allied and Healthcare Professions.)
   i. Faculty:
      a. Postgraduate degree in Physiotherapy in the specified specialty
      b. At least 5 years of clinical/teaching experience
   ii. Senior Faculty:
      a. Postgraduate degree in Physiotherapy in the specified specialty
      b. At least 8 years of clinical/teaching experience
2. Desirable Qualification for both i and ii: Published at least 2 research papers in UGC CARE indexed journals

3. Faculty Set Requirements for the Program: Minimum Faculty for a fellowship program with 3 students:
    i. 1 Senior Faculty (SF)
    ii. 1 Faculty (F)
    iii. 1 Medical Professional (as required)

3. Institution and Training Site Requirements

1. Hospital/University/academy or institute Requirements: (for their structured program to be considered should have affiliation with
    i. Mixed multi-specialty hospital with at least 100 beds or Subspecialty hospital with at least 50 beds
    ii. Functioning for more than 3 years
2. Site Requirements:
    i. Affiliated to an academic institution or approved by the National Commission for Allied and Healthcare Professions, for the said program
    ii. Outpatient Physiotherapy department with at least 1200 sq. ft. area
    iii. Registered full-time Physiotherapists with National Commission for Allied and Healthcare Professions
    iv. Providing specified specialty services for 3 consecutive years
    v. Adequate patient flow for clinical exposure
3. Approval and Inspection:
    i. Obtain necessary approval from National Commission for Allied and Healthcare Professions before commencing the fellowship program.
    ii. An inspection team from the National Commission for Allied and Healthcare Professions shall be sent to ensure the appropriateness of the fellowship training

4. Proposal Submission:
    i. Submit a detailed proposal to the authority, including:
        a. Training structure
        b. Course curriculum
        c. Faculties
        d. Existing clinical services
        e. Administrative and academic management
        f. Entry and exit criteria
        g. Evaluation of the trainee and the training program

4. Entry Criteria

1. Registration: Candidate must be registered with the National Commission for Allied and Healthcare Professions.
2. Prerequisite Knowledge and Experience: Candidate must have at least one year of experience in a related subject/discipline and fulfil the necessary knowledge, skills, and qualifications.
3. Admission Frequency: Candidates can apply for admission for a maximum of ONCE a year.
4. Eligibility of candidate: The eligibility of the trainee for the programme is determined on the basis of prescribed criteria in the information bulletin for respective institution.

5. Selection Criteria

1. Public Advertisement: Admission to the fellowship program must be advertised in a public news portal.
2. Entrance Examination: A written and/or oral entrance examination will be conducted for candidate selection.

6. Learning Outcomes

1. Definition: A learning outcome is a statement that outlines what a participant is expected to know, understand, and demonstrate by the end of the learning period.
2. Components: Learning outcomes include communication skills, knowledge, understanding, clinical skills, and technical know-how.

7. Logbook and Records

1. Maintenance: A logbook must be maintained by the candidate, detailing academic competency, clinical competency, skills obtained, and related activities.
2. Clinical Competencies: The logbook should include details of clinical competencies with prespecified number of minimum records for:
    i. Patient Case logs/ records
    ii. Procedures
    iii. Presentations
    iv. Journal club meetings
3. Program Structure: The logbook should outline the program's content, structure, and timetable.
4. References: Each topic and subtopic should be supported by references used by the presenter and facilitator.
5. Project Work: Writing a Project is essential for all candidates towards partial fulfillment of eligibility for award of the qualification and they are required to submit their thesis before the cutoff date prescribed by institution for the purpose of their eligibility for Final Examination.

8. Job Description and Stipend

1. Clear Job Description: Details about the fellow's duties, responsibilities, and stipend must be explained before enrollment. Candidates already pursuing or have joined the program are not eligible for admission to any other seat for the entire duration prescribed for the course already joined by them earlier. This shall be irrespective of their resignation or discontinuation from the said program due to any reason.
2. Candidates desirous of applying for admission should seek requisite “No Objection Certificates" (NOC) from their employers well in advance.
3. Stipend: A stipend is strongly recommended for the fellow. The trainees should be paid stipend for the entire duration of training including their eligible leave as per leave guidelines. However, they shall not be paid stipend for a period more than the duration of the training program, if in case their training gets extended due to excess leave availed by them.

9. Clinical Rotations and Leave

1. Posting Duration: The posting duration in various units should be specified, with a minimum of 2/3rd of the total duration spent in the core specialty/subspecialty.
2. Elective Posting and Research: The remaining one third duration can be used for elective posting, research, and related supporting disciplines
4. Minimum work hours should be 7 hours/day for 6 days/week.
5. Minimal Requirements and Criteria: Minimal requirements and criteria can be developed or modified with prior permission from the licensing authority.
6. Leave Policy: Leave should not exceed 1 day per month. Leave taken beyond 12 days must be compensated to maintain program validity. The extension of leaves might even affect the eligibility of the trainee for Final Examination. In case his/her extended training goes beyond the prescribed cut-off date for completion of training/ excess leave beyond a prescribed limit may even lead to cancellation of the registration of trainees for the program.
7. Logbook Records: Attendance, leave, and clinical rotations must be recorded in the logbook. A regular review of the said e-logbook by the mentor/guide of the trainee is a mandatory requisite

10. Method of Assessment and Evaluation

1. Internal Assessments: At least two formal internal assessments must be conducted during the fellowship program.
2. Final Exit Examination: A final exit examination is mandatory after completing clinical fellowship training conducted once in a year.
3. Examination Components: The final exit examination consists of:
    a. Written examination (3 hours, 100 marks, corrected by an external examiner)
    b. Clinical examination (long case, short case, OSCE, and viva with a total of 100 marks), with at least one external and one internal examiner
4. Minimum number of Credits: It is mandatory for all trainees to attend the minimum number of Internal Assessments during their training to be specified in program brochure and after pre approval from the governing authority.
5. Passing Criteria: Candidates must secure 50% in both theory and clinical exams to pass the final fellowship examination and be awarded a Clinical Fellowship Certificate by the organizing institution.

6. The Project work of the candidate shall be evaluated by the examiner on the following parameters: Protocol Submission and Assessment of Project and Project Viva wrt

    i. Research Purpose
    ii. Review of Literature
    iii. Data collection and analysis
    iv. Analysis and interpretation of Findings
    v. Conclusion and Recommendations
    vi. Referencing
    vii. Readiness for Project work Completion and Quality in terms of clinical Applicability

11. Inspection Fee

An inspection fee of ₹50,000 (Rupees Fifty Thousand) will be charged per visit by the National Commission for Allied and Healthcare Professions.

Acknowledgement and Reference:

https://www.gscpt.in/guidence-for-fellowship-program

Manual for DNB Broad Speciality Trainees 2022

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