



**MANAV RACHNA INTERNATIONAL INSTITUTE OF
RESEARCH AND STUDIES**

**(Deemed to be University under section 3 of the UGC Act,
1956)**

**FACULTY OF ALLIED HEALTH SCIENCES
CURRICULUM BOOKLET**

**MASTER OF PHYSIOTHERAPY
(MUSCULOSKELETAL, NEUROLOGY & SPORTS)**

Academic Session: 2021-23

FOREWORD

This is to certify that this booklet contains the entire Curriculum and Scheme of Examination of Masters of Physiotherapy (MPT) Faculty of Allied Health Sciences of this University. This has been duly vetted and finally approved by 40th and 41th Academic Council of the University vide 10th May 2022 and 30th August 2022 respectively and changes, if any deemed appropriate, shall be duly incorporated after the necessary approval by the Academic Council.

This Curriculum and Scheme of Examination of MPT shall be implemented w.e.f. AY 2021-22.

Date:

**Prof. (Dr.) Naresh Grover
Dean-Academics, MRIIRS**

PREAMBLE

Physiotherapy or Physical Therapy (PT) is a science of movement with proven theoretical and empirical foundation and widespread clinical applications in the prevention, regeneration and recovery, preservation and promotion of optimal physical function. Physiotherapists diagnose and treat movement disorder and develop physical and functional capacity. This physical dysfunction may be a result of the involvement of any system such as the Musculoskeletal, Neurological, Cardiovascular, Respiratory or other body systems.

India has a population of 1.37 billion people, however there are only 0.59 physiotherapists for every 10000 people in the country. In India, there is a significant shortage of physiotherapists, which opens up a lot of opportunities. The global estimate of the number of people who are disabled is growing as a result of ageing populations, the rise in the prevalence of chronic diseases, and advancements in the methodology that are used to measure impairment. In addition to providing direct patient care, physiotherapists can participate in global health work in a variety of other ways, such as advocating for and developing rehabilitation programmes, as well as continuing to be more involved in the global trend toward implementing community-based rehabilitation as a strategy for the sustainable and effective development of the health and social sectors. There are a lot of different ways that physiotherapists can get involved in global health work.

These therapists add to society and the discipline through all the training, teaching, administration and exploration and implementation of new information of physiotherapy encounters of adequate excellence and depth through research studies to allow the creation and application of critical knowledge, skills and behaviors as applied to physiotherapy practice. The physiotherapist (PT) are self-employed, successful and caring practitioners who work collaboratively in a range of healthcare environments, like neonatal to geriatric, from critical care to group fitness to sports training. Emerging graduates and postgraduate students are expected to demonstrate a significant knowledge base, possess skills relevant to physiotherapy activities, possess a high emotional quotient to resolve family wellbeing and fulfil community obligations and illustrate gender sensitivity and socio-cultural competence. They should be mindful of the ethical concerns governing professional practice and obey evidence based on clinical practice.

Diversity in the higher education system and the various approaches taken by universities towards the curriculum, assessment, evaluation and grading system have contributed to a lack of uniformity. Although universities must have the versatility and independence to develop assessment and evaluation methods that are ideally adapted to the curriculum, syllabi and teaching-learning methods, there is a need to formulate a sensible framework for the awarding of grades based on student results. The performance of students is usually reported using the traditional method of marks secured in exams, grades, or both. The transformation from marks to letter grades and the letter grades used differ widely across universities across the world. This causes difficulties for the academy and employers to consider and conclude the relative success of graduate students from various universities and colleges across the globe.

The grading system is considered better than the traditional marking system and has therefore been adopted in the leading institutions in India and abroad. The implementation of a standardized grading system will promote student mobility between institutions within and across countries and will allow potential employers to assess student performance. To achieve the desired uniformity, in the grading system and the computing method of the cumulative grade point average (CGPA) centered on the performance of the students throughout the

examinations, the UGC has formulated the guidelines and transmitted them to all universities for adoption.

The Master of Physiotherapy program is designed to allow students to develop sufficient expertise, skills and clinical experience leading to the opportunity to establish an independent professional practice in specific areas of interest. The overall content of the program focuses on the academic environment and clinical learning experience of each student that includes the following-

- Ethical, evidence-based, effective treatment of adult and pediatric patients/clients with a variety of conditions e.g. musculoskeletal, neuromuscular, cardiovascular/pulmonary, integumentary, etc.) over their lifetime and continuum of care, for all individuals regardless of gender, caste, country, state and territory, region, minority groups or other groups.
- Ability to avoid movement disorders or to maintain/remain optimum function and quality of life in persons with movement disorders.
- The opportunity to serve as independent practitioners, as well as members of health service provider teams, serves as first-contact practitioners from whom patients/clients can obtain direct services without a referral from another health care professional.
- Willingness to encourage the health and wellbeing of individuals and the general public/society, stressing the importance of physical activity and exercise.
- Avoiding impairments, activity limits, participatory constraints and disabilities in persons at risk of impaired movement due to health factors, socio-economic stressors, environmental factors and lifestyle factors.
- Provide interventions/treatment to regain the integrity of body structures necessary for movement, optimize function and rehabilitation, reduce incapacity and improve quality of life, independent living and work ability in individuals and groups of individuals with abnormal movement patterns resulting from impairments, activity limitations, participatory restrictions and disabilities.
- Capacity to change access to the community, home and work, and obstacles to ensure full involvement in one's natural and expected social roles.
- Becoming an integral part of the health and community/welfare service delivery structures, practice independently of other health care/service providers and even within the context of interdisciplinary recovery programs, autonomous clinical practice in self-employed settings or jobs in various locations such as hospitals, nursing homes, catering institutions under particular circumstances (likes)
- Motivation to conduct research projects

The Master of Physiotherapy (MPT) in Musculoskeletal program introduced by Manav Rachna International Institute of Research and Studies promises to generate professionals having extensive and elaborated knowledge in the field of Musculoskeletal Physiotherapy. The duration of MPT in musculoskeletal is two years offerings course with four semesters. Practical training to students is imparted at the state-of-the-art Department of Physiotherapy, Faculty of Allied Health Sciences, Manav Rachna International Institute of Research and Studies and various Hospitals of Delhi NCR where students get hands-on training under the expert faculty. Students expand their horizons of therapeutic and rehabilitative concepts; thus, the students

have the advantage of excellent clinical practice, besides the highest level of academic activity, which bridges the gap between theoretical knowledge and its practical application.

MRITRS

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DEPARTMENT OF PHYSIOTHERAPY

VISION

To impart latest knowledge and skills so as to kindle innovation & creativity among students, to develop and sustain a culture of research while promoting values, ethics and responsible professionalism, leading to a progressive career in industry & academia globally.

MISSION

1. To engage modern education aids, laboratories and competent faculty ensuring effective teaching learning process to meet the ever growing and changing industrial and business environment.
2. To continuously challenge the young minds with ideas so as to carry out innovative research through interaction with the research organizations & industry and to provide them avenues for recognition by participation in challenging platforms.
3. To develop responsible citizens and professional leaders with high ethical and moral values, who contribute in dissemination of universal science and technology.

ABOUT THE DEPARTMENT

The Department of Physiotherapy is committed to accomplish the students with thorough knowledge on the subjects to meet the need – based demand of the 21st century. The department has set a benchmark in the academics, clinical practice and research in Physiotherapy for past eleven years. The programs aim at facilitating personal and professional growth of students so that they can develop their knowledge, skills and attitudes needed for the effective management and care of patients and to become competent practitioners of physiotherapy. It prides itself on creating an environment of substantial academic freedom overlaid by rigorous, self-imposed standards of excellence and socially responsive practices. The department of physiotherapy willingly submits itself to a unique, rigorous, open, and continuous process of appraisal and feedback from the students. The faculty plays a hands-on role in the governance of the teaching methodology and assumes total ownership of collective decisions, and keeps itself abreast of current developments in the related fields of Physiotherapy.

The Post Graduate program in Physiotherapy offers specialization in Sports, Musculoskeletal, Cardio-pulmonary and Neurology. These programs provide in-depth study and comprehensive practical as well as professional knowledge of immense value in view of global acceptance. The program boasts of practical based curriculum, backed by state-of-the-art laboratories, sound infrastructure as well as innovative & interesting learning procedures.

The intellectual capital at the department is highly qualified, well experienced and research oriented. The faculty members actively participate in academic activities other than teaching and research engagements and extend every support in organizing academic and professional activities of high credentials from time to time. The department of Physiotherapy maintains active interface with the public and private entrepreneurs of health industry and other promotional organizations to understand the future needs and demands.

Program Education Objectives:

The Department of Physiotherapy keeping in view interests of all their stakeholders have formulated the Program Educational Objectives (PEO's) that are comprehensive statements describing the career and professional accomplishments that the program is preparing the learner for.

PROGRAM EDUCATION OBJECTIVES:

The Department of Physiotherapy keeping in view interests of all their stakeholders have designed the Program Educational Objectives (PEO's) that are comprehensive statements describing the career and professional accomplishments that the program is preparing the learner for.

PEO'S OF BACHELOR PROGRAM IN MASTER OF PHYSIOTHERAPY ARE:

PEO1: Communication- Effective communication and interpersonal skill which are adapted to meet the needs of diverse individuals and groups.

PEO2: Ethical and Legal Standards- Adherence to safe, ethical and legal standards of current practice (as identified by professional organizations, federal and state law and accrediting bodies).

PEO3: Diagnosis and plan of care- Development of physiotherapy diagnoses and an individualized plan of care for the management and prevention of movement dysfunction across the life span.

Demonstrate effective physiotherapy screening of the following systems for keep-referdecisions: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary.

Demonstrate effective history taking, examination, evaluation, and re-evaluation that leads to an appropriate physiotherapy diagnosis and prognosis for patients with disorder of the following systems: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary

Develop an appropriate plan of care and intervention for patients with disorders of the following systems: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary.

Assess and address needs of individuals and communities for health promotion and prevention of movement dysfunction.

PEO4: Team Member- Effective participation as an intra- and inter-professional team member.

PEO5: Practice Management- Effective clinical practice management for delivery of physiotherapy services in diverse settings.

PEO6: Teaching and Learning Practices- Application of teaching and learning principles in educational, practice, and community settings.

PEO7: Evidence Based Practice- Application of principles of critical thinking and clinical reasoning to evidence-based physiotherapist practice.

PEO8: Professional responsibility and Commitment- Responsibility and commitment to the profession and society through life-long learning and involvement in activities beyond the job responsibilities.

PROGRAM OUTCOMES (POs) / PROGRAM SPECIFIC OUTCOMES (PSOs)

Program Outcomes / Program Specific Outcomes describe graduate attributes i.e. what students are expected to know or will be able to do when they graduate from a program.

The POs / PSOs of Master of Physiotherapy are:

PO1: Disciplinary Knowledge- Integrate concepts from the biological, physical, behavioural, and clinical sciences into physical therapy services

PO2: Professional Ethics- Exhibit professional conduct and behaviours that are consistent with the legal and ethical practice of physical therapy

PO3: Patient Care- Demonstrate compassion, caring, integrity, and respect for differences, values, and preferences in all interactions with patients/clients, family members, health care providers, students, other consumers, and payers

PO4: Communication Skills- Demonstrate culturally sensitive verbal, nonverbal, and written communications that are effective, accurate, and timely

PO5: Research related Skills- Collect and critically evaluate data and published literature to apply in the delivery of care, practice management, and to examine the theoretical and scientific basis for physical therapy

PO6: Analytical Skills- Complete a patient/client examination/ re-examination and evaluate and interpret the examination data to determine a physical therapy diagnosis and prognosis

PO7: Community Health- Provide services and information related to health promotion, fitness, wellness, health risks, and disease prevention within the scope of physical therapy practice.

PO8: Leadership skills- Employ effective leadership skills in the context of supervising, delegating, and mentoring within the profession

Program Specific Objectives:

PSO1: Problem Solving- Screen patients/clients to determine if they are candidates for physical therapy services or if a referral to, or consultation with, another health care professional or agency is warranted

PSO2: Critical Thinking- Employ critical thinking, self-reflection, and evidence-based practice to make clinical decisions about physical therapy services

PSO3: Collaboration- Collaborate with patients/clients, caregivers, and other health care providers to develop and implement an evidence-based plan of care that coordinates human and financial resources

PSO4: Legal Issues- Advocate for patient/client and profession

PSO5: Health Delivery- Provide consultative services and education to patients/clients, caregivers, health care workers, and the public using culturally sensitive methods that are adapted to the learning needs, content, and context

Mapping of PEOs with POs and PSOs

PEO	P O- 1	P O- 2	P O- 3	P O- 4	P O- 5	P O- 6	P O- 7	PO -8	P S O- 1	P S O- 2	P S O- 3	P S O- 4	P S O- 5
PEO-1	-	-	1	3	1	2	3	2	1	-	2	-	1
PEO-2	-	3	2	-	1	-	2	1	-	-	2	3	1
PEO-3	1	1	3	2	2	2	-	-	1	2	-	-	2
PEO-4	-	3	1	-	1	-	2	2	2	1	3	1	3
PEO-5	3	1	3	1	2	2	-	-	1	2	-	-	2
PEO-6	1	-	1	1	-	2	3	1	-	1	2	-	2
PEO-7	2	-	2	-	3	2	1	-	3	2	-	-	2
PEO-8	-	-	2	-	2	1	1	-	1	1	3	2	1

ORDINANCE AS PER HARYANA STATE COUNCIL OF PHYSIOTHERAPY

SCHEDULE OF EXAMINATION

- i) A candidate will be declared pass in the MPT-2nd year examination if he/she has passed all the papers including theory and practical of MPT.1st year has passed all the papers of MPT-2nd year besides acceptance of research dissertation, passing in viva-voce of research dissertation.
- ii) A candidate is required to pass all MPT-1st year 2nd year examination within 4 years from the date of admission to M.P.T. 1st year.

ELIGIBILITY FOR ADMISSION

A Candidate who has passed Bachelor of Physiotherapy from any Indian/Foreign Universities/ Board aggregate 55% marks in Bachelor of Physiotherapy or from recognized college and has completed six months of compulsory rotatory internship.

COURSE DURATION

The duration of the course of Institution leading to the Degree of Master of Physiotherapy (M.P.T.) shall be two years including compulsory submission of dissertation and clinical practice. M.P.T. first Examination will be held at the end of First academic year, second at the end of second academic year, in the month of April/ May on such dates as may be fixed by the Vice Chancellor.

SELECTION CRITERIA FOR ADMISSION

Selection criteria for admission in M.P.T. shall be as per the norms adopted for post graduate selection in physiotherapy under state council/university from time to time.

MEDIUM OF INSTRUCTION:

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

OBTAINING MEMBERSHIP OF HARYANA STATE COUNCIL FOR PHYSIOTHERAPY

Candidates should obtain registration of **Haryana State Council for Physiotherapy** in one month (maximum period) after getting admission in course. In case of foreign nationals, the most recent guidelines of state council/university may be followed.

The guide to student's ratio shall be 1:3 for admission in first year M.P.T. and cannot be extended in any case. Guide should be of the same post graduate degree. The intake of students to the course shall be at the starting of academic year only. No postgraduate seats left unfilled in an academic year shall be carried forward to the next or subsequent academic years.

EXAM

Final examination will be held at the end of two academic years.

ESSENTIALITY TO APPEAR IN EXAM

Student must be having attendance as described.

Dissertation submitted by student must be accepted by authority.

SCHEME OF EXAMINATION

The exam of Master in Physiotherapy will be taken by theory, practical and viva-voce.

EXAMINERS

All examiners shall be recognized post graduate teachers. At least 50 % of total examiners shall be externals. (Other universities)

CRITERIA FOR PASS

A candidate is declared to have passed in university exam if he/she secures minimum 50% marks in Theory and Practical separately. The minimum number of marks required to pass in each examination shall be.

- 50% in theory including written, oral and internal assessment of theory subject
- 50% in the Practical including clinical of each subject and internal assessment.

SUPPLEMENTARY EXAM

A candidate will have to reappear in the whole examination including theory and practical during the supplementary examination.

Supplementary examination can be conducted after 6 months of the main Examination.

A candidate is required to pass the re-appear papers (S) within consecutive chances i.e., supplementary and annual examination excluding the chance of main examination, failing which he/she shall repeat the entire course subject to class- (Exam C ii).

DECLARATION OF CLASS:

- Successful candidate who obtained 80% marks or more in any subject shall be declared to have passed with 'Distinction' in that subject provided he passes in all the subjects of the Examination at one and same time.
- MPT. Degree with "Honor" shall be awarded to candidate who has completed the course in the minimum period.
- Has passed each to the first and second examination in the first attempt obtaining not less than 70% of the marks to each subject of every examination.

ATTENDANCE

No candidate shall be permitted to appear for the examination unless he/she puts 75% of the training during each academic year of the post graduate course and produces the necessary certificate of study and attendance from head of the institution.

- 75% of the full course of the Lectures delivered and
- 75% of the full course of practical held separately
- 75% of the full of clinical practice held separately.
- Submission of Research dissertation of respective discipline selected in MPT. Course

RE-ADMISSION AFTER BREAK OF STUDY:

All re-admissions of candidates are subject to the approval of the Vice Chancellor of concerned university.

COMMENCEMENT OF THE COURSE -

The course shall commence as per the notification of Council/University

COURSE OF THE STUDY

The course of the study, subjects and teaching schedule for I and II-year M.P.T. course is shown separately in table 1 and 2.

Scheme MPT 1st Year

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES																
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FACULTY OF ALLIED HEALTH SCIENCES																
DEPARTMENT OF PHYSIOTHERAPY																
MPT																
YEAR-I																
Course Type	Course Code	Title of Course		Periods/Week				Marks				Hours	Duration of Exam	Credits		
				L	T	P	Total	Cont. Eval	End Sem Exam	Total	Total (L+P)			Theory	Practical	Total
Audit Pass Course																
Compulsory Courses																
Foundation	MPT 101	Review of Basic Sciences I (Anatomy & Physiology)	MPT 101	2	0	0	2	20	80	100	100	80	3	4	-	4
	MPT 102	Review of Basic Sciences II (Pathology & Pharmacology)	MPT 102	2	0	0	2	20	80	100	100	80	3	4	-	4
	MPT 104	Applied Biomechanics & Ergonomics	MPT 104	2	0	0	2	20	80	100	100	80	3	4	-	4
	MPT 105	Biostatistics and Research Methodology	MPT 105	2	0	0	2	20	80	100	100	80	3	4	-	4
	MPT 106	Professional Development & Ethics	MPT 106	2	0	0	2	20	80	100	100	80	3	4	-	4
Core	MPT 103	Applied Physiotherapy	MPT 103 (T)	1	0	0	1	20	80	100	200	120	3	2	-	4
	MPT 103	Applied Physiotherapy	MPT 103 (P)	0	0	2	2	20	80	100	200	120	3	-	2	2
Skill Development	MPT 107	Seminar/Case Presentation	MPT 107	0	0	6	6	-	-	-	100	240	-	-	6	6
	MPT 108	Clinical Training*	MPT 108	0	0	36	36*45 weeks	-	-	-	100	1620	-	-	12	12
Total											1100	2500				44
<p>* Clinical Training credit is calculated as 135 hrs =1 Credit , For clinical training the student shall be required to put in 15 hrs per week out of 36 hrs mentioned in the scheme as some clinical posting /training at Clinics/ Hospitals/ Sports Academy beyond institutional working hours ,for which he/she shall be submitting weekly progress report to his/her assigned faculty supervisor.</p>																

Scheme MPT 2nd Year: Neurology

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES (Deemed to be University under section 3 of the UGC Act 1956) FACULTY OF ALLIED HEALTH SCIENCES DEPARTMENT OF PHYSIOTHERAPY MPT YEAR-II																
Course Type	Course Code	Title of Course	Period/Week				Theory Marks			Practical Marks			Hours	Duration of Exam	Credits	
			L	T	P	Total	Cont. Eval	End Sem Exam	Total	Cont. Eval	End Sem Exam	Total				
Audit Pass Course																
Compulsory Courses																
Core	MPT 201	Assesment and diagnosis of Neurological Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 202	Medical and Surgical Management of Neurological Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 203	Physiotherapy Management in Neurological Conditions	3	0	0	3	20	80	100	-	-	-	100	120	3	6
	MPT 204	Recent Advances in Neurological Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
Skill Development Course	MPT 205	Practical	0	0	2	2	-	-	-	50	100	150	150	80		2
	MPT 206	Seminars/Case Presentations	6	0	0	6	-	-	-	100	-	100	100	240		12
	MPT 207	Dissertation Project Work (based on clinical/case presentation including viva voce)*	0	0	36	36* 45 Weeks	-	-	-	-	100	-	100	1620	-	6
Total													750	2300		38

* Dissertation credit is calculated as 2 hrs Per week of contact hours with Guide

Scheme MPT 2nd Year: Musculoskeletal

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES																
(Deemed to be University under section 3 of the UGC Act 1956)																
FACULTY OF ALLIED HEALTH SCIENCES																
DEPARTMENT OF PHYSIOTHERAPY																
MPT																
YEAR-II																
Course Type	Course Code	Title of Course	Period/Week				Theory Marks			Practical Marks			Total	Hours	Duration of Exam	Credits
			L	T	P	Total	Cont. Eval	End Sem Exam	Total	Cont. Eval	End Sem Exam	Total				
Audit Pass Course																
Compulsory Courses																
Core	MPT 301	Assesment and diagnosis of Musculoskeletal Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 302	Medical and Surgical Management of Musculoskeletal Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 303	Physiotherapy Management in Musculoskeletal Conditions	3	0	0	3	20	80	100	-	-	-	100	120	3	6
	MPT 304	Recent Advances in Musculoskeletal Conditions	2	0	0	2	20	80	100	-	-	-	100	80	3	4
Skill Development Course	MPT 305	Practical	0	0	2	2	-	-	-	50	100	150	150	80		2
	MPT 306	Seminars/Case Presentations	6	0	0	6	-	-	-	100	-	100	100	240		12
	MPT 307	Dissertation Project Work (based on clinical/case presentation including viva voce)*	0	0	36	36* 45 Weeks	-	-	-	-	100	-	100	1620	-	6
Total						17							750	2300		38
* Dissertation credit is calculated as 2 hrs Per week of contact hours with Guide																

Scheme MPT 2nd Year: Sports

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES																
(Deemed to be University under section 3 of the UGC Act 1956)																
FACULTY OF ALLIED HEALTH SCIENCES																
DEPARTMENT OF PHYSIOTHERAPY																
MPT																
YEAR-II																
Course Type	Course Code	Title of Course	Period/Week				Theory Marks			Practical Marks			Total	Hours	Duration of Exam	Credits
			L	T	P	Total	Cont. Eval	End Sem Exam	Total	Cont. Eval	End Sem Exam	Total				
Audit Pass Course																
Compulsory Courses																
Core	MPT 501	Assesment and diagnosis of Sports Injuries	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 502	Medical and Surgical Management Sports Injuries	2	0	0	2	20	80	100	-	-	-	100	80	3	4
	MPT 503	Physiotherapy Management Sports Injuries	3	0	0	3	20	80	100	-	-	-	100	120	3	6
	MPT 504	Recent Advances in Sports Injuries	2	0	0	2	20	80	100	-	-	-	100	80	3	4
Skill Development Course	MPT 505	Practical	0	0	2	2	-	-	-	50	100	150	150	80		2
	MPT 506	Seminars/Case Presentations	6	0	0	6	-	-	-	100	-	100	100	240		12
	MPT 507	Dissertation Project Work (based on clinical/case presentation including viva voce)*	0	0	36	36* 45 Weeks	-	-	-	-	100	-	100	1620	-	6
Total						17							750	2300		38
* Dissertation credit is calculated as 2 hrs Per week of contact hours with Guide																

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES
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MPT 101 REVIEW OF BASIC SCIENCES-I (ANATOMY & PHYSIOLOGY)

Periods/week Credit
L: 2 T:0 4
Duration of Examination: 3 Hrs

Max. Marks:100
Continuous Evaluation: 20
End semester examination: 80

Pre-requisite: Nil

Course Type: Foundation

Course Outcomes:

Student will be able to

- MPT 101.1** Recall the basic knowledge of anatomy, physiology, Exercises Physiology
- MPT 101.2** Classify, describe and explain the basic medical science of human body
- MPT 101.3** Understanding physiological adaptations that occur following exercise training
- MPT 101.4** Knowledge in the performance, understanding and interpretation of basic physiological assessment such as indirect calorimetry, muscular fitness and cardiovascular analyses.
- MPT 101.5** Describe physiological functions of various systems, with special reference to Neuromuscular, Cardio respiratory, endocrine and locomotor system and their application to clinical symptomatology
- MPT 101.6** Knowledge of the acute and chronic physiological changes that occur in the body in response to exercise Stress.

Unit 1: Human Anatomy

- 1.1 Bone/Joints (Osteo and Arthrology)
- 1.2 Muscle (Myology)
- 1.3 Nervous and Nervous System
- 1.4 Integumentary System

Unit: 2 Upper Limb and Lower Limb , Cardio-Respiratory and Nervous System, Introduction to trunk region , Cardiovascular System, Head & Neck.

- 2.1 Bone and Joints
- 2.2 Muscles
- 2.3 Nervous and Nervous System
- 2.4 Vascular System

Various regions:

- Upper limb pectoral, axilla, scapular, arm, forearm, acubital fossa and hand
- Lower limb-thigh, gluteal region, popliteal fossa, leg and foot

- **Introduction to trunk region**
- 2.5 Bone and joints (Vertebrae, Ribs and Sternum)
- 2.6 Muscle
- 2.7 Nerve and plexuses
- 2.8 Vascular Structures
- 2.9 Various region-
 - Thoracic
 - Lumbar
 - Sacro-coccygeal.
- **Head & Neck**
- 2.10 Bone & Joints
- 2.11 Muscles
- 2.12 Nerve and plexuses
- 2.13 Vascular Structures
- 2.14 Various regions-
 - Head-coronial cavity, orbit, nasal, cavity, oral cavity
 - Neck-triangles (anterior & posterior) back of neck
 - TMJ
- **Cardio-Respiratory system**
- 2.15 Pleura and lungs
- 2.16 Pericardium and heart
- 2.17 Vessels and large Vessels
- **Nervous System**
- 2.18 Neuro-Anatomy
 - Central Nervous System (Brain and Spinal Cord)
 - Somatic Nervous System (Cranial and Spinal Nervous)
 - Autonomic Nervous System
- 2.19 ii) Meanings and Ventricular System of C.N.S.
- 2.20 iii) Blood Supply to C.N.S.
 - Human Physiology *A Review of clinical and applied Physiology
- **Cardiovascular System**
- 2.21 Structure and Properties of heart.
- 2.22 Cardiac Cycle.
- 2.23 The regulation of Heart's performance / circulation during Exercise
- 2.24 Cardiac Output
- 2.25 The Arterial Blood Pressure
- 2.26 The Physiology of Vascular System
- 2.27 Lymphatic Circulation

- 2.28 Protection from Coronary Heart Disease
- 2.29 Sudden Cardiac Death of Sports
- **Respiratory System**
- 2.30 Ventilation and Control of Ventilation
- 2.31 Alveolar air
- 2.32 Regulation of Breathing/ Respiration during Exercise
- 2.33 Pulmonary Function test
- 2.34 Air Conditioning
- 2.35 Second Wind
- 2.36 Oxygen Debt
- 2.37 Breath holding and scuba diving. Health Pressure Ventilation.

Unit 3: Muscle Physiology

- 3.1 Electrical properties of Neuron
- 3.2 Classification of Nerve Injury
- 3.3 Effects of Nerve Injury
- 3.4 Structure of Skeletal Muscle
- 3.5 Electrical properties of Skeletal Muscle
- 3.6 The contractile Mechanism
- 3.7 Length- Tension Relationship
- 3.8 Fast and slow Muscles
- 3.9 Skeletal Muscle metabolism
- 3.10 Growth and Exercise
- 3.11 Repair and Adaptation during exercise
- 3.12 Training for Muscular Strength and Endurance
- 3.13 Muscle tissue fiber typing and its significance

Unit 4 : Exercise Physiology

- 4.1 Muscle & its contraction- Architecture of skeletal muscles, sliding filament theory, types of muscle fibers, mechanical efficiency of muscle contraction, force-velocity, motor unit, muscle fatigue- blood supply, prolonged exercise.
- 4.2 Blood & Circulation
- 4.3 Cardiac cycle – pressure during cardiac cycle, Hemodynamic mechanical work and pressure Hydrostatic pressure, flow and resistance, venous – capillary structure and transport Mechanisms, filtration & osmosis, visualization of skeletal muscles, regulation circulation During exercise, cardiac output & O₂ updates- stroke volume, blood pressure.

4.4 Respiration-Lung compliance air way resistance, pulmonary ventilation rest and during exercise, diffusion in lung tissues, gas pressure- ventilation & perfusion- Regulation of breathing – Exercise, high air pressure- Breath holding diving.

4.5 Physical Performance-Aerobic process intensity & duration of exercise , prolonged exercise , muscular stress involved in Exercise

4.6 Anaerobic Process: Power & Capacity of high energy breakdown.

4.7 Lactate: Production- Distribution & Disappearance, effect of metabolism on tissue & blood, PH, Anaerobic, oxygen uptake in various sports. Evaluation of anaerobic power exercise electrocardiogram.

4.8 Physical Training: Training Principles, continuous vs. Intermittent exercise training methods & biological long term effects of training. Disuse, isometric strength training, dynamic strength training. Training of aerobic training, Endurance training , retaining, recovery after exercise, Mechanical efficiency technique, body composition, stretching, psychological aspects muscular soreness, ischemic heart diseases, contra indication to physical training.

4.9 Applied work Physiology: Factors affecting sustained Physical work, assessment of work load relation to work capacity, Assessment of maximal aerobic power measurement of oxygen uptake in a typical work situation, Assessment of load exerted on specific muscles, classification of work, Daily rates of energy expenditure, energy expenditure during specific activities like sleeping, sedentary, work house work, light industry, manual labour.

4.10 Fatigue: General Physical fatigue, local muscular fatigue, cardiac rhythm in humans, shift work, effect of menstruation.

4.11 Nutrition & Physical Performance: Nutrition in general digestion, energy metabolism & factors governing the selection of fuel for muscular exercises, food for the athlete, energy balance, regulation of food intake, ideal weight obesity, slimming diets, optional supply of Nutrients.

4.12 Factors Affecting Performance: High altitude- limited factors, oxygen transport, adaptation of high altitude, high gas pressure, pressure effects, nitrogen, oxygen, carbon dioxide metabolism in sports , tobacco smoking circulatory effects, reparatory effects, metabolic effects, smoking habits among athletes, alcohol & exercise –Neuromuscular function, aerobic & anaerobic alcohol power, metabolic effects, caffeine, Doping and "THE WILL TO WIN"

Unit : 5 Gastrointestinal tract & Endocrine

5.1 Effect of sports on G.I.T. and liver

5.2 Hormone regulation fluid and electrolytes during Exercise

5.3 Exercise and Menstrual Cycle

5.4 Stress Hormones in Exercise

5.5 Effects of Exercise on various Hormones in the body

5.6 Opioids, Runner's high

Unit 6 : Nervous System

6.1 Elementary Neuro-anatomy

- 6.2 Neurons and Neuralgia
- 6.3 Properties of nerve fibers, synapse
- 6.4 Spinal cord
- 6.5 Cerebral cortex
- 6.6 Pyramidal and extra Pyramidal system
- 6.7 The cerebellum
- 6.8 Autonomic nervous system
- 6.9 Cerebrospinal fluid
- 6.10 Cranial nerves

Text Books/References Book:

1. G.A. Decker, 2018, Synopsis of Surgical Anatomy, 12th Edition, John Wright & Sons.
2. S. Standing ,2008, Gray’s Anatomy ,40 th Edition, Churchill Livingstone
3. J. C. Boileau Grant,1989,Methods of Anatomy,11 th Edition, Lippincott Williams and Wilkins
4. Richard S. Snell, 2000,Clinical Anatomy for Medical Students, 6 th Edition, Lippincott Williams and Wilkins
5. and Wilkins
6. John E. Hall , 2019,Textbook of Medical Physiology ,14 th Edition, Elsevier
7. Michael Glynn ,2017, Hutchinsons – Clinical Methods of Medicine 24 th Edition, Elsevier
8. Chatterjee C.C. 2017. Medical Physiology Vol-I & II. 11 th Edition. CBS
9. Bijlani R.L. and Manjunatha S. 2010. Understanding Medical Physiology: A textbook for medical students. 4 th Edition. Jaypee Brothers Medical Publishers
10. students. 4 th Edition. Jaypee Brothers Medical Publishers
11. Jain A.K. 2018. Manual of Practical Physiology for MBBS. 5 th Edition. Arya Publications.
12. Anand S.K. and Manchanda S.K. Textbook of Physiology. 2 nd Edition. Tata McGraw-Hill Publishing.
13. Chaudhari S.K. 2011. Concise Medical Physiology. 2 nd edition. New Central Book Agency.
14. Revised by Varshney V.P. and Bedi M. 2018. Textbook of Practical Physiology. 9 th Edition. Jaypee Brothers Medical Publishers.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix:

CO Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT 101.1	3	1	3	1	3	2	3	2	-	1	1	2	3
MPT 101.2	2	2	1	-	2	-	-	2	3	3	-	2	-
MPT 101.3	-	2	2	2	2	3	2	-	2	2	3	3	3
MPT 101.4	2	3	-	3	-	2	-	2	3	1	3	-	2
MPT 101.5	3	-	3	2	2	3	2	-	-	3	2	3	-
MPT 101.6	3	3	-	1	-	2	2	3	2	-	1	-	1

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES
(Deemed to be University under section 3 of the UGC Act, 1956)
MPT 102 REVIEW OF BASIC SCIENCES-II (PATHOLOGY & PHARMACOLOGY)

Periods/week Credit
L: 2 T:0 4
Duration of Examination: 3 Hrs

Max. Marks:100
Continuous Evaluation: 20
End semester examination: 80

Pre-requisite: Nil

Course Type: Foundation

Course Outcomes:

Student will be able to

MPT 102.1 Describe the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs; capacity of the body in healing process.

MPT 102.2 Recall the etiopathogenesis, the pathological effects and the clinical-pathological correlation of common infection and non-infectious disease.

MPT 102.3 Correlate normal and altered morphology of different organ systems in different diseases needed to understand the disease process and their clinical significance (with special emphasis to neuro-musculoskeletal and cardiovascular – respiratory system).

MPT 102.4 Recall and **understand** the basics of pharmacology, pharmacokinetics & pharmacodynamics.

MPT 102.5 Apply the understanding the classes of the drugs, their metabolism, and route of administration, absorption and excretion from human body.

MPT 102.6 Conclude pharmacological effects of commonly used drugs by patients referred for physiotherapy; list their adverse reactions, precautions to be taken, contraindications, formulation and route of administration

SECTION A: Pathology

Unit 1: General Pathology (cell injury, inflammation, Repair, immune system)

- 1.1 Geriatric
 - i) Theories of aging
 - ii) Pathological & Physiological changes of aging
- 1.2 General body systems

Unit 2: Nervous System

- 2.1 Infection
 - Meningitis
 - Encephalitis
- 2.2 Vascular Disease
 - 2.2.1 Ischemic encephalopathy
 - 2.2.2 Cerebral infarction
 - 2.2.3 Intracranial infarction
 - 2.2.4 Intracranial hemorrhage
- 2.3 Degenerative disease
 - 2.3.1 Alzheimer's disease
 - 2.3.2 Huntington's disease

- 2.3.3 Parkinson 's disease
- 2.3.4 Motor neuron disease

- 2.4 Demyelinating disease
- 2.4.1 Multiple sclerosis

- 2.5 The peripheral nervous system
- 2.5.1 peripheral neuropathy
- 2.5.2 Acute idiopathic polyneuropathy

Unit 3: MUSCULOSKELETAL SYSTEM

3.1 Heredity and metabolic diseases (Osteoporosis, Rickets, osteomalacia, osteitis fibrosa cystica, renal osteodystrophy)

3.2 Joints

- Degenerative joint disease
- Bursitis

Unit 4: Skeletal muscles

- muscle atrophy
- Myositis
- Myasthenia

Unit 5: Cardiovascular system

- Rheumatic heart disease
- Myocardial infarction
- Atherosclerosis
- Congenital heart disease

Unit 6: Pharmacology

- Drugs used in pain
- Local anesthetics
- Steroids
- Muscle relaxants
- Drug acting upon central and Automatic nervous system
- Topically acting upon Cardio Respiratory system
- Drugs acting upon Musculoskeletal System

Recommended Books:

1. V. Kumar, A. Abbas and J. Aster, 2014,Robbins and Cotran Pathological Basis of Disease. 9th Edition. Saunders publishers.
2. J.R. Andersons, 1986, Muri's Text Book of Pathology. 12th Edition .Wiley online library.
3. H. Mohan, 2010,Text Book of Pathology. 6th Edition. Jaypee Brothers Medical Publisher.
4. Akerman & Richards, Microbiology- An Introduction for the Health Sciences. 1st Edition. W.B Saunders Co.
5. K.D. Tripathi, 2013,Essential of Medical Pharmacology.7thEdition.Jaypee Brothers Medical Publishers.
6. C.Ciccone ,2007,Pharmacology in Rehabilitations- F. A. Davis. 4th Edition,David Plus.
7. J.H. Gaddum, 1948, Pharmacology. 3rd Edition. Oxford University Press.

8. S.D. Satoskar & S.D. Bhandarkar, 2005, Pharmacology & Pharmacotherapeutics. Revised 19th Edition. Elsevier.
9. J.C. Krantz & C.J. Carr, 1965, Pharmacology principle of Medical practice. 6th Edition. Williams and Wilkins.
10. L. Brunton, B.A. Chabner and B. Kollman, 2011, Goodman and Gilman's Pharmacology basis of Therapeutic. 12 Edition. McGraw-Hill Education.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

CO Statement (MPT 102)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT 102.1	3	1	3	1	3	2	3	2	-	1	1	2	3
MPT 102.2	2	2	1	-	2	-	-	2	3	3	-	2	-
MPT 102.3	-	2	2	2	2	3	2	-	2	2	3	3	3
MPT 102.4	2	3	-	3	-	2	-	2	3	1	3	-	2
MPT 102.5	3	-	3	2	2	3	2	-	-	3	2	3	-
MPT 102.6	3	3	-	1	-	2	2	3	2	-	1	-	1

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 103(T): Applied Physiotherapy

Periods/week Credit

L: 1 T:0 C:2

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 20

Annual Examination: 80

Course Type: Program Core

Course Outcomes: The students will be able to

MPT 103.1 Understand the recent advances of exercise therapy and its application as treatment modalities.

MPT 103.2 Understand the recent advances of electrotherapy and its application as treatment modalities

MPT 103.3 Learn the assessment of physical impairment or dysfunction by using various measurement tools/equipment.

MPT 104.4 Learn the techniques of manual techniques or muscle facilitation techniques.

MPT 104.5 Deliver effective treatment for stress or anxiety management.

MPT 104.6 Develop and demonstrate the techniques of manual therapy, exercise therapy and electrotherapy.

PART A

Unit 1: Assessment techniques

1.1 Manual Muscle Testing

- Upper Extremity, Lower Extremity and Spine

1.2 Goniometry

1.3 Upper Extremity, Lower Extremity and Spine

2 Posture

2.1 Evaluation and management of impaired balance

3 Gait

3.1 Evaluation and training of impaired gait (according to gait cycle phases and pathological gait)

Unit 2: Manual Therapy Techniques

2.1 Joint Mobilization techniques

2.2 Soft tissue mobilization

Unit 3: Stretching and Strengthening techniques

3.1 Stretching Exercises

- Upper Extremity, Lower Extremity and Spinal muscles.

3.2 Strengthening Exercises

3.3 Isotonic, Isometric and Isokinetic exercises

3.4 Methods of progressive resisted exercise

3.5 Close kinetic and Open kinetic exercises

3.6 Dynamic exercises

PART B

Unit 4: Neuromuscular Control Techniques

4.1 Neuromuscular control

- Evaluation and examination of Proprioception and Kinesthetic sensation

- 4.2 Balance and Coordination
- 4.3** Examination & Evaluation of impaired balance and coordination
- 4.4** balance and coordination exercises
- 4.5** Proprioceptive neuromuscular facilitation techniques

Unit 5: Relaxation and Hydrotherapy

- 5.1 Relaxation
 - Relaxation Position
 - General and Local relaxation techniques.
 - Relaxation techniques and methods
- 5.2 Hydrotherapy
- 5.3 Demonstration of methods of hydrotherapy

Unit 6: Recent Advances in Electrotherapy

- 6.1 Low, Medium and High Currents and their modifications like Di- dynamic and Russian Currents etc.
- 6.2 Ultrasound Therapy
- 6.3 Cryotherapy
- 6.4 Thermal modalities
- 6.5 SWD, MWD, Hydro Collator, Wax therapy Fluido-therapy
- 6.6 L.A.S.E.R
- 6.7 UVR and IRR

Text Books/References Book:

1. Kendall, 2005, Muscles – Testing and Function, 5th edition, Williams & Wilkins
2. Daniels and Worthinghams, 2007, Muscle Testing – Techniques of Manual Examination, 9th edition, W.B. Saunders
3. Norkin & White, 2017, Measurement of Joint Motion – A Guide to Goniometry, 5th edition, F.A. Davis
4. Mishra, 2013, Clinical Neurophysiology, 3rd edition, B.I. Churchill Livingstone.
5. Gardiner M. Dena, The Principles of Exercise Therapy, 4th edition, CBS Publishers, Delhi.
6. Sinha A.G., 2010, Principle and Practices of Therapeutic Massage, 2nd edition, Jaypee Brothers, New Delhi.
7. Kisner and Colby, 2012, Therapeutic Exercises – Foundations and Techniques, 6th edition, F.A. Davis
8. Freddy M. Kaitenborn et al., 2012, Manual Mobilization of the Joints: The Spine, Volume II: Joint Examination and Basic Treatment, 2nd Edition, Orthopedic Physical Therapy & Rehabilitation Production.
9. Jeferry Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques, 2nd Edition, North Atlantic Books
10. Brian R.Mulligan, 2010, Manual therapy, 5th edition, Bateson Publishing Ltd
11. R.A Mckenzie, 2006, The Cervical and Thoracic spine-Mechanical Diagnosis and Therapy (Vol I & II), 2nd Edition.Spinal publication ltd.
12. Brian C.Edwards, 1999, Manual of Combined movements -2nd edition, Butterworth-Heinemann
13. Donnetelli Wooden, 2009 Orthopaedics Physical therapy, 4th edition, Churchill Livingstone
14. Voss et al, 1985, Proprioceptive Neuromuscular Facilitation - Patterns & Techniques, 3rd edition, Williams & Wilkins
15. T.Watson. 2008. Electrotherapy, evidence-based practice. 12th Ed. Churchill Livingstone.
16. W.E.Prentice. 2005. Therapeutic Modalities in Rehabilitation. 3rd Edition. McGraw-Hill Medical publication.
17. P.Barron. 2009. Hydrotherapy Theory and Technique. 4th Ed. Pine Island Publishers.

18. V.Robertson.2006. Electrotherapy Explained: Principles & practice. 4th Ed. Butterworth Heinmann.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix

CO Statement MPT 103(T)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT 103.1	2	1	3	-	3	-	3	1	2	2	2	-	3
MPT 103.2	2	1	3	-	3	-	3	1	2	1	2	-	3
MPT 103.3	1	-	-	2	3	3	1	-	2	3	1	-	2
MPT 103.4	1	2	3	2	3	3	2	-	3	3	-	1	2
MPT 103.5	3	2	3	3	1	1	2	-	2	2	-	-	2
MPT 103.6	2	-	3	2	2	-	2	-	3	3	-	1	2

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 103(P): Applied Physiotherapy

Periods/week Credit

P: 2 T:0 C:2

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 20

Annual Examination: 80

Course Type: Program Core

Course Outcomes: The students will be able to

MPT 103.1 Understand the recent advances of exercise therapy and its application as treatment modalities.

MPT 103.2 Understand the recent advances of electrotherapy and its application as treatment modalities

MPT 103.3 Learn the assessment of physical impairment or dysfunction by using various measurement tools/equipment.

MPT 104.4 Learn the techniques of manual techniques or muscle facilitation techniques.

MPT 104.5 Deliver effective treatment for stress or anxiety management.

MPT 104.6 Develop and demonstrate the techniques of manual therapy, exercise therapy and electrotherapy.

PART A

Unit 1: Assessment techniques

3.2 Manual Muscle Testing

- Upper Extremity, Lower Extremity and Spine

3.3 Goniometry

3.4 Upper Extremity, Lower Extremity and Spine

4 Posture

4.1 Evaluation and management of impaired balance

5 Gait

5.1 Evaluation and training of impaired gait (according to gait cycle phases and pathological gait)

Unit 2: Manual Therapy Techniques

2.3 Joint Mobilization techniques

2.4 Soft tissue mobilization

Unit 3: Stretching and Strengthening techniques

3.7 Stretching Exercises

- Upper Extremity, Lower Extremity and Spinal muscles.

3.8 Strengthening Exercises

- 3.9** Isotonic, Isometric and Isokinetic exercises
- 3.10** Methods of progressive resisted exercise
- 3.11** Close kinetic and Open kinetic exercises
- 3.12** Dynamic exercises

PART B

Unit 4: Neuromuscular Control Techniques

- 4.6 Neuromuscular control
 - Evaluation and examination of Proprioception and Kinesthetic sensation
- 4.7 Balance and Coordination
- 4.8** Examination & Evaluation of impaired balance and coordination
- 4.9** balance and coordination exercises
- 4.10** Proprioceptive neuromuscular facilitation techniques

Unit 5: Relaxation and Hydrotherapy

- 5.4 Relaxation
 - Relaxation Position
 - General and Local relaxation techniques.
 - Relaxation techniques and methods
- 5.5 Hydrotherapy
- 5.6 Demonstration of methods of hydrotherapy

Unit 6: Recent Advances in Electrotherapy

- 6.7 Low, Medium and High Currents and their modifications like Di- dynamic and Russian Currents etc.
- 6.8 Ultrasound Therapy
- 6.9 Cryotherapy
- 6.10 Thermal modalities
- 6.11 SWD, MWD, Hydro Collator, Wax therapy Fluido-therapy
- 6.12 L.A.S.E.R
- 6.7 UVR and IRR

Text Books/References Book:

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- 20. Daniels and Worthinghams, 2007, Muscle Testing – Techniques of Manual Examination, 9th edition, W.B. Saunders

1. Norkin & White, 2017, Measurement of Joint Motion – A Guide to Goniometry, 5th edition, F.A. Davis
2. Mishra, 2013, Clinical Neurophysiology, 3rd edition, B.I. Churchill Livingstone.
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5. Kisner and Colby, 2012, Therapeutic Exercises – Foundations and Techniques, 6th edition, F.A. Davis
6. Freddy M. Kaltenborn et al., 2012, Manual Mobilization of the Joints: The Spine, Volume II: Joint Examination and Basic Treatment, 2nd Edition, Orthopedic Physical Therapy & Rehabilitation Production.
7. Jeferry Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques, 2nd Edition, North Atlantic Books
8. Brian R.Mulligan, 2010, Manual therapy, 5th edition, Bateson Publishing Ltd
9. R.A Mckenzie, 2006, The Cervical and Thoracic spine-Mechanical Diagnosis and Therapy (Vol I & II), 2nd Edition.Spinal publication ltd.
10. Brian C.Edwards, 1999, Manual of Combined movements -2nd edition, Butterworth-Heinemann
11. Donnetelli Wooden, 2009 Orthopaedics Physical therapy, 4th edition, Churchill Livingstone
12. Voss et al, 1985, Proprioceptive Neuromuscular Facilitation - Patterns & Techniques, 3rd edition, Williams & Wilkins
13. T.Watson. 2008. Electrotherapy, evidence-based practice. 12th Ed. Churchill Livingstone.
14. W.E.Prentice. 2005. Therapeutic Modalities in Rehabilitation. 3rd Edition. McGraw-Hill Medical publication.
15. P.Barron. 2009. Hydrotherapy Theory and Technique. 4th Ed. Pine Island Publishers.
16. V.Robertson.2006. Electrotherapy Explained: Principles & practice. 4th Ed. Butterworth Heinmann.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Parameter of Continuous Evaluation:

Viva - I	50%
Viva - II	50%
Preliminary Viva	35%
File/ Log Book	15%

Course Articulation Matrix

CO Statement MPT 103(P)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT 103.1	2	1	3	-	3	-	3	1	2	2	2	-	3
MPT 103.2	2	1	3	-	3	-	3	1	2	1	2	-	3
MPT 103.3	1	-	-	2	3	3	1	-	2	3	1	-	2
MPT 103.4	1	2	3	2	3	3	2	-	3	3	-	1	2
MPT 103.5	3	2	3	3	1	1	2	-	2	2	-	-	2
MPT 103.6	2	-	3	2	2	-	2	-	3	3	-	1	2

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 104 APPLIED BIOMECHANICS AND ERGONOMICS

Periods/week Credit

L: 2 T:0 4

Duration of Examination: 3 Hrs

Max. Marks:100

Continuous Evaluation: 20

End semester examination: 80

Pre-requisite: Nil

Course Type: Foundation

Course Outcomes: Student will be able to

MPT 104.1 Understand the Fundamental Mechanics and tools used to study Human Motion.

MPT 104.2 Describe the biological, mechanical, and neurological mechanisms by which muscles produce movement.

MPT 104.3 Interpret the mechanics of Connective Tissue and the joints of the Human Body.

MPT 104.4 Identify the Concept of Work, Energy & Power in relation to Human Motion.

MPT 104.5 Analyze and **differentiate** between the Normal & Pathological GAIT.

MPT 104.6 Understand & apply Ergonomical Principles to the real world.

Unit 1 Fundamental Mechanics & Kinematics

- 1.1 Forces; composition and resolution of forces; force systems
- 1.2 Force of gravity and COG
- 1.3 Stability
- 1.4 Reaction forces
- 1.5 Friction
- 1.6 Moments
- 1.7 Newton's laws
- 1.8 Equilibrium: static and dynamic
- 1.9 Simple machines: Levers, pulleys and wheel and axle
- 1.10 Segmental dimensions
- 1.11 Poisson's effect
- 1.12 Static and cyclic load behaviours
- 1.13 Load: Load sharing and load transfer
- 1.14 Motion: types, location, magnitude and direction
- 1.15 Angular motion and its various parameters
- 1.16 Linear motion and its various parameters
- 1.17 Projectile motion

Unit 2: Muscle, Ligament & Tendon Mechanics

- 2.1 Structure and composition of muscle
- 2.2 Fiber length and cross-section areas
- 2.3 Mechanical properties
- 2.4 EMG changes during fatigue
- 2.5 Changes in mechanical properties because of aging, exercise and immobilized of immobilization
- 2.6 Clinical application
- 2.7 Structure, composition and mechanical properties
- 2.8 Cross-sectional area measurement
- 2.9 Muscle tendon properties
- 2.10 Temperature sensitivity
- 2.11 Changes in mechanical properties because of ageing, exercise and immobilization
- 2.12 Mechanoreceptors
- 2.13 Clinical application

Unit 3: Bone & Joint Mechanics:

- 3.1 Structure and composition of bone
- 3.2 Stress
- 3.3 Strain
- 3.4 Modulus of Rigidity & Modulus of elasticity
- 3.5 Mechanical properties of Trabecular system
- 3.6 Mechanical properties of cortical bone
- 3.7 Bone Remodeling
- 3.8 Response of bone to aging & exercise & immobilization
- 3.9 Mechanics to prevent fracture in bone
- 3.10 Clinical application
- 3.11 Joint design
- 3.12 Joint categories
- 3.13 Joint Functions: Arthrokinematics, Osteokinematics and kinematics chains
- 3.14 Joint forces, equilibrium and distribution of these forces
- 3.15 Degenerative changes in weight bearing joints and compensatory actions
- 3.16 Joint stability and mechanisms
- 3.17 Clinical applications

Unit 4: Measurement Instruments & Mechanical energy, Work and power

- 4.1 Photo-optical devices
- 4.2 Pressure transducers and Force Plates

- 4.3 Gait Analyzer
- 4.4 Iso kinetic device
- 4.5 EMG(Electrophysiology of muscle contraction, recording, processing)
- 4.6 Relationship between EMG and Biomechanical Variables
- 4.7 Definitions: Mechanical energy, Work and power
- 4.8 Positive and negative muscles work
- 4.9 Muscle mechanical power
- 4.10 Causes of inefficient, movement co-contractions, Isometric contractions, against gravity jerky
- 4.11 movement, energy generation at one joint and absorption at another, energy flow.
- 4.12 Energy Storage

Unit 5: Gait & Pathomechanics

- 5.1 Gait parameter: kinetic, kinematics, time-space
- 5.2 Pathological gait
- 5.3 Running
- 5.4 Stair climbing Changes in gait following various surgeries/diseases/disorders
- 5.5 Bone and joint Patho-mechanics Neural Patho-mechanics
- 5.6 Cardio Patho –mechanics Pulmonary Patho-mechanics Vascular Patho-mechanics

Unit 6: Ergonomics

- 6.1 Definitions: Ergonomics
- 6.2 Physiological and bio-mechanical risk factors
- 6.3 Job design
- 6.4 Developing and implementing work site programme
- 6.5 Ergonomics in home, child care and leisure activities
- 6.6 Addressing problems at computer workstation

Reference books

- 1) Shirl J. Hoffman & Duane V. Knudson, 2017, Introduction to kinesiology, 5th Edition, Human Kinetics
- 2) Oatis, Carol A: 2008, Kinesiology: the Mechanics & Pathomechanics of Human Movement, 2nd Edition, Lippincott Williams and Wilkins
- 3) Norkin & Levangie: 2016, Joint Structure and Function - A Comprehensive Analysis, 5th Edition, Jaypee
- 4) Levangie, P.K. and Norkin, C.C., 2011. Joint structure and function: a comprehensive analysis, 4th Edition, F.A. Davis Company
- 5) Orkaya, N, Duane Knudson: 2008, Fundamentals of Biomechanics, 2nd Edition, Springer
- 6) Karen Jacobs & Carl M. Bettencourt: 2007, Ergonomics for therapists, 3rd Edition, Mosby

- 7) Gavriel Salvendy: 2012, Handbook of human Factors and ergonomics: 4th Edition, John Wiley & Sons, Inc
- 8) K.H.E.Kroemer, H.B.Kroemer, K.E.Kroemer-Elbert: 2001, Ergonomics: How to design for ease and efficiency, 1st Edition, 2001
- 9) Pheasant Stephen: 1991, Ergonomics, Work, and Health, 1st edition, Palgrave Macmillan

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

PO-CO Statement (MPT 104)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT 104.1	2	-	3	-	2	2	-	-	3	3	-	-	3
MPT 104.2	2	1	2	-	2	2	3	-	1	2	1	-	3
MPT 104.3	3	-	2	1	3	2		2	3	1		2	1
MPT 104.4	2	1	2	-	2	2	3	-	1	2	1	-	3
MPT 104.5	2	1	2	1	1	3	2	-	3	2	-	-	3
MPT 104.6	3	1	1	-	2	-	1	-	2	-	3	1	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES
(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 105: Biostatistics and Research Methodology

Periods/week Credit

L: 2 T:0 C:4

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 20

End Semester Examination: 80

Course Type: Program Core

Course Outcomes: The students will be able to

MPT 105.01 Understand basic concepts of research and its methodologies.

MPT 105.02 Prepare and organize a project proposal and conduct research (advanced project)

MPT 105.03 Review literature, formulate problems, write a research report and publish the report.

MPT 105.04 Develop skills of critical thinking and selection of research strategy

MPT 105.05 Interpret a variety of statistical tests of significance.

Unit 1: Introduction

1.1 Introduction

1.2 Description and inferential statistics

1.3 Central Tendency: Mean, Median, Mode and Standard deviation

1.4 Methods of collection, classification, Tabulation and presentation of data

Unit 2: Basic probability distribution and sampling distributions:

2.1 Types of sampling Tests

2.2 Probability, Binomial distribution, Poisson distribution, Normal distribution

Unit 3: Tests of Significance:

3.1 Hypothesis and testing Data collection

3.2 Test of significance (t, chi square, f, z)

3.3 One way ANOVA, Two Way ANOVA

3.4 Non parametric tests

3.5 Karl Pearson's co-relation method Rank co-relation method Regression and co efficient sampling

3.6 Simple statistical analysis using available software

Unit 4: Research in Physiotherapy

4.1 Introduction to research: Framework, levels of measurements, variables

4.2 Basic research concepts: Validity and reliability

4.3 Design instrumentation and analysis of qualitative research

4.4 Design instrumentation and analysis of Quantitative research

4.5 How to read and critique research

4.6 How to write a research proposal

Unit 5: Ethics in Research

5.1 The use and protection of human and animals subjects.

Reference books

- Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). Research methods in physical activity. Human kinetics.
- Bio-Statistics. Prof. S.C. Gakhar

- French, S., Reynolds, F., & Swain, J. (2001). Practical research: A guide for therapists. Elsevier Health Sciences.
- Domholdt, E. (2005). Rehabilitation research: principles and applications. Saunders.
- Mahajan, B. K. (1970). Methods in Biostatistics for Medical Students. Kothari Book Depot.
- Baride, J. P., Kulkarni, A. P., & Muzumdar, R. D. (2003). Manual of biostatistics. Jaypee Brothers.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Articulation matrix

PO-CO Statement (MPT-DC-105)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
MPT-DC-105.1	1	-	-	1	-	1	3	1	-	-	1		3
MPT-DC-105.2	1	2	3	3	1	2	2	3	2	1	1		3
MPT-DC-105.3	-	-	1	1	-	1	1	-	1	1	-	2	1
MPT-DC-105.4	-	2	3	3	-	1	2	-	1	2	1		3
MPT-DC-105.5	-	3	3	3	2	1	2	1	3	2	1		3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 106 Professional Development & Ethics

Periods/week Credit

L: 2 T:0 C:4

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 20

Annual Examination: 80

A Course Type: Program Core

Course Outcomes: The students will be able to

MPT 106.1 Understand the basic issues of management & administration

MPT 106.2 Practice as an informed professional on legal & ethical issues pertaining to physiotherapy.

MPT 106.3 Understand the Dynamics of teaching & learning process

MPT 106.4 Plan effective teaching sessions in Physiotherapy

MPT 106.5 To provide honest quality care, competent and accountable professional consultancy,

MPT 106.6 To develop ethical professional practice with the knowledge of the same.

Unit 1: Concepts of Teaching and Learning

1.1 Meaning and Scope of Educational Psychology, Meaning and Relationship between Teaching and Learning

1.2 Learning Theories, Dynamics of Behavior, Individual Differences

1.3 Meaning and Concepts of Curriculum, Basis of Curriculum Formulation Development, Framing Objectives for Curriculum, Process of Curriculum Development and Factors Affecting Curriculum Development, Evaluation of Curriculum

1.4 Method and Techniques of Teaching: Lecture, Demonstration, Discussion, Seminar, Assignment, Project and Case Study

1.5 Planning for Teaching: Bloom's Taxonomy of Instructional Objectives, Writing Instructional, Unit planning and Lesson planning

1.6: Teaching Aides: Types of Teaching Aides, Principles of Selection, Preparation & Use of Audio-Visual aids.

1.7 Measurements and Evaluation: Nature of Educational Measurement; Meaning, Process and Types of Tests, Construction of Achievement Test and its Analysis Standardized Test, Introduction of some Standardized tool, Important of Intelligenee, Aptitude Personality.

UNIT 2: Management

2.1 Functions of management

2.2 Management process: planning, organization, direction, controlling, and decision- making

2.3 Personal management: staffing, recruitment selection performance appraisal, collective bargaining, discipline, and job satisfaction.

2.4 Quantitative methods of management: relevance of statistical and /or techniques in management.

2.5 Marketing: marketing segmentation, marketing research production, planning pricing, and channels of distribution, consumer behavior and licenser.

2.6 Total Quality Management: basis of quality management, quality assurance program in hospitals, medical addit and international quality system.

UNIT 3. Administration of the Department

3.1 Hospital as an organization: functions and types of hospitals selected, clinical supportive and ancillary staff of the hospital, emergency department, nursing, physical medicine and rehabilitation, clinical laboratory, pharmacy and dietary department.

3.2 Roles of Physiotherapy Director, Physiotherapy Supervisor, Physiotherapy Assistant, Physiotherapy, Occupational therapist, Home Health Aide and Volunteer.

3.3 Clinical education: Awareness and guidance to the common people about health diseases and available professional services, Patient education, Education of the practitioners

UNIT 4: Physiotherapy Ethics

4.1 Physiotherapy: Definition and Development.

4.2 Direct acre and referral relationships and confidentiality.

4.3 Implications and conformation to the Rules of Professional Conduct.

4.4 Code of Ethics: wider knowledge of ethics relating to current social and medical policy in the provision of health care.

4.5 Standards of practice for Physiotherapy

4.6 Guidance and Counseling: Meaning and Concepts of Guidance and Counseling, Principles, Guidance and Counseling Services for Students and Faculty members, Faculty Development and Development of Personnel for physiotherapy Services

UNIT 5: Laws And Professional Associations

5.1 Legal responsibility for their action in the professional context and understanding the Physiotherapist's liability and obligations in the case of medico-legal action.

5.2 Function of relevant professional associations education body and trade union

5.3 Role of the International Health agencies such as the World Health Organization

5.4 Current Issues

UNIT 6: Computer skills

6.1 Basic of Computer-Hardware and Software

6.2 Basic Computer Applications- Windows, MS Word, Excel, Power Point, etc.

Reference books

1. Educational Technology, Dr. S.C. Gakhar

2. Texalli, R. K., & Texalli, R. K. (1996). Foxpro 2.5 Made Simple for Dos and Windows. BPB Pub..
3. Hunt, R., & Shelley, J. (1979). Computers and commonsense. Englewood Cliffs, N.J: Prentice-Hall International.
4. Naidoo, J., & Wills, J. (Eds.). (2015). Health studies: an introduction. Macmillan International Higher Education.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation matrix

PO-CO Statement (MPT 106)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PS O 1	PS O 2	PS O 3	PS O 4	PSO 5
MPT 106.1	-	-	-	1	1	2	3	2	1	1	-	-	-
MPT 106.2	2	3	3	1	1	1	3	3	1	1	2	2	3
MPT 106.3	3	1	3	1	1	1	3	3	1	1	1	2	1
MPT 106.4	1	-	3	1	1	1	3	3	1	1	3	2	3
MPT 106.5	3	3	2	1	1	3	2	-	3	2	2	1	-
MPT 106.6	2	-	1	-	2	-	1	-	2		2	1	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 107 SEMINARS/ CASE PRESENTATION

Periods/week Credit

P: 6 T:0 C:6

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 100

Annual Examination: 80

Pre-requisites: Nil

Course Type: Skill Development Course

Course Outcomes: The students will be able to

MPT 107.1 To enhance applied communication abilities of the students

MPT 107.2 To enhance personal effectiveness by raising awareness about self

MPT 107.3 To enhance way of physical and verbal presentation and efficiently manage self in front of others.

MPT 107.4 To develop the right attitude towards work and life to increase efficiency, reduce stress and increase happiness quotient

Distribution of Continuous Assessment

1.	Attendance	20%
2.	Class Performance	20%
3.	Knowledge about the presentation	20%
4.	Presentation by the student	20%
5.	History taking, points covered by the students	20%

PO-CO Statement (MPT 107)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PS O 1	PS O 2	PS O 3	PS O 4	PSO 5
MPT 107.1	1	-	-	1	-	-	3	1	-	-	1	-	-
MPT 107.2	1	2	1	1	2	1	2	3	2	1	1	2	1
MPT 107.3	-	-	1	-	-	1	1	-	1	1	-	-	1
MPT 107.4	-	2	2	1	2	2	2	-	1	2	1	2	2

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 108 CLINICAL TRAINING

Periods/week Credit

P: 36 T:0 C:12

Duration of Examination: 3 Hrs

Max. Marks: 100

Continuous Evaluation: 20

Pre-requisites: Nil

Course Type: Skill Development Course

Course Outcomes: Students will be able to

MPT 108.1 Understand the patient centric approach towards care & evaluation.

MPT 108.2 Apply the various investigative & rehabilitation techniques in patient care.

MPT 108.3 Analyze and select correct treatment plan.

MPT 108.4 Create exercise plan according to the patient's condition.

It consists of mandatory clinical practice by each student, discharging his / her services to cure patients in highest possible ethical manner conforming to professional guidelines and maintaining responsibilities of student physiotherapist. Students would be assessed fortnightly for their performance both internally and End Semester Exam and recorded for their allotment of marks in each semester as per the following criteria:

Internal Evaluation based on:

- Specialty assessment of the clinical cases, recording and submission
- Knowledge, capacity to critically analyze, diagnosis making, formulating effective Evidence based physiotherapy program
- Viva-voce with presentation

End Semester Exam Evaluation based on:

- Punctuality and consistency of clinical practice
- Specialty assessment of the clinical cases, recording and submission
- Conforming to best practices in handling the cases / patients
- Knowledge, capacity to critically analyze, diagnosis making, formulating effective Evidence based physiotherapy program
- Viva-voce with presentation

Text Books/References Book:

The students will be encouraged to keep revising & revisiting the various text-books they have studied previously for refreshing their concepts.

1. J. Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques. 2nd Edition. North Atlantic Books.
2. C. J. Manheim, 2008, The Myofascial Release Manual. 4th Edition. SLACK Incorporated.

3. J. Langendoen, 2014, Kinesiology Taping The Essential Step-By-Step Guide: Taping for Sports, Fitness and Daily Life. 1st Edition. Robert Rose Inc.
4. G. Cook, 2011, Movement: Functional Movement Systems: Screening, Assessment, Corrective Strategies. 2nd Edition. Lotus Publisher.
5. N. Swedan, 2001, Women's Sports Medicine and Rehabilitation. 1st Edition. Aspen Publishers Inc.

Instructions for paper setting: The practical exam should be conducted under following headings:

Demonstration of the practical 15 marks

Viva 15 marks

Practical file 10 marks

Spotters 10 marks

Distribution of Continuous Assessment

Viva I	20%
Viva II	20%
Preliminary Viva	35%
Log Book/File	15%
Class Performance	10%

PO-CO Statement (MPT 108)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PS O 1	PS O 2	PS O 3	PS O 4	PSO 5
MPT 108.1	1	-	-	1		3	3	1	-	-	1		3
MPT 108.2	1	2	1	1		3	2	3	2	1	1		3
MPT 108.3	-	-	1	-	2	1	1	-	1	1	-	2	1
MPT 108.4	-	2	2	1		3	2	-	1	2	1		3

ANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 201: Assessment and Diagnosis of Neurology Condition

Periods/week

Credits

Max. Marks : 100

L: 2 T: 0

4

Continuous Evaluation: 20

Duration of Examination: 3 Hrs

End Semester Examination : 80

Pre-requisite: Nil

Course Type: Core

Course Outcomes: Student will be able to

MPT 201.1. Perform thorough Physiotherapy assessment & list deficiencies.

MPT 201.2. Design individualized goals for the patient.

MPT 201.3. Rationalize the outcome of the assessment.

MPT 201.4. Analyze principles of pathological investigations and imaging techniques related to Neurological disorders with interpretation

MPT 201.5. Differentiate between various other neurological condition

MPT 201.6. Interpret the condition through neurodiagnostic techniques

PART A

Unit 1: General Examination

- 1.1 Clinical decision making
- 1.2 Fundamentals of neurological Examination
 - 1.2.1 Patient History
 - 1.2.2 General Observation(Gait, Posture, built)
 - 1.2.3 Examination(Tone, coordination, abnormal involuntary movement, muscle eyes, Response to muscle)
 - 1.2.4 Reflexes (Superficial and deep,developmental),

Unit 2: Neurological Examination

- 2.1 Mental Functions examination
- 2.2 Mental status examination
- 2.3 Language and motor speech
- 2.4 Sensory examination.

Unit 3: Central Nervous system Examination

- 3.1 Autonomic examination
- 3.2 Cerebellar function examination
- 3.3 Clinical examination of all Neurological problems
- 3.4 Balance and coordination
- 3.5 Vestibular System

PART B

Unit 4: Neuroimaging :

- 4.1 Plain roentgenography
- 4.2 Myelography
- 4.3 Cerebral angiography
- 4.4 Computer Tomography
- 4.5 MRI and MRI Angiography

4.6 Radio nucleotide imaging

Unit 5: Neurophysiology

5.1 EEG

5.2 EMG

5.3 NCV

5.4 Examination of CSF

5.5 Other special techniques I Neurodiagnosis

Unit 6:

6.1 Differential diagnosis in Neurological Conditions.

Text Books/References Book:

1. Barrett Kim et al., 2015, Ganong's Review of Medical Physiology, 25th edition, Lange Medical Book
2. Karim Khan, 2019, Clinical sports Medicine, 6th edition, McGraw- Hill Education/Australia
3. William E. Prentice, Rehabilitation Techniques, 6th edition, SLACK Incorporated
4. O' Sullivan, Schmitz, 2013, Physical Rehabilitation, 6th edition
5. Reed, 1991, Sports Injuries, 1st edition, Churchill Livingstone

Assessment Tools:

- Sessional tests
- Assignment
- Surprise questions during lectures/Class Performance
- Term end examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of continuous Assessment

Sessional - I	25%
Sessional - II	25%
Preliminary	35%
Viva	
Assignment	15%

Course Articulation Matrix

PO-CO Statement (MPT 201)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P SO 1	P SO 2	P SO 3	P SO 4	P SO 5
MPT 201.1	2	2	1	3	2	2	2	-	3	2	-	-	2
MPT 201.2	3	-	2		2	2	3	1	2	-	-	-	3
MPT 201.3	3	2	3	1	2	1	2	1	3	2	2	1	3
MPT 201.4	2	2	2	-	3	3	-	-	2	3	-	2	3
MPT 201.5	3	-	2	-	3	-	-	-	1	2	-	2	2
MPT 201.6	1	3	3	2	2	-	-	1	-	2	-	2	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 202: Medical and Surgical Management in neurological disorders

Periods/week **Credits**
L: 2 T: 0 **4**
Duration of Examination: 3 Hrs

Max. Marks : 100
Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisite: Nil

Course Type: Core

Course Outcomes: Student will be able to

MPT 202.1. Apply the principles of clinical neuro diagnosis and investigation to enlist deficiencies.

MPT 202.2. Relate the effects & uses of using various Evaluation Scales and Assessment methods used in neurological rehabilitation.

MPT 202.3. Plan and apply different rehabilitation program of various neurological conditions and therefore, design individualized goals for the patient.

MPT 202.4. Interpret the knowledge of the outcome of the assessment.

MPT 202.5. Enhance the skills in assessing, treating and evaluating patients with CNS Disorders

MPT 202.6. Enable to find, understand and report result from research related to the field

PART A

Unit 1: Congenital/hereditary disorders and Traumatic condition

- 1.1 Traumatic brain and spinal cord injury
 - 1.1.1 Head Injury.
 - 1.1.2 Comatose patient
 - 1.1.3 Closed skull fractures
 - 1.1.4 Hematomas, subdural, epidural and intracerebral
 - 1.1.5 Open cranio-cerebral injuries
 - 1.1.6 Reconstruction operations in head injuries
 - 1.1.7 Acute traumatic injuries
 - 1.1.8 Vascular disease of brain- Aneurysms, Thrombosis
 - 1.1.9 Disorders of cerebral circulation-Stroke
- 1.2 Congenital/hereditary disorders
 - 1.2.1 Haematomyelia and acute central cervical cord injuries
 - 1.2.2 Slow progressive compression of the spinal cord
 - 1.2.3. Syringomyelia
 - 1.2.4 Ischemia and infraction of the spinal cord and cauda equina
 - 1.2.5 Spina bifida
 - 1.2.6 Malformation of spine and spinal cord
 - 1.2.7 Cerebral malformations

Unit 2: Disorder of central nervous system

- 2.1 Disorders of cranial nerves
- 2.2 Ataxia
- 2.3 Motor neuron disease
- 2.4 Demyelinating disorders-Multiple sclerosis, Diffuse sclerosis
- 2.5 Disorders of vestibular system
- 2.6 Extrapyramidal disorders- Parkinsonism, Basal ganglia disorders

2.7 Epilepsy, Dementia, Alzheimer's disease

Unit 3: Disorders of muscle and peripheral nerves

- 3.1 Disorders of peripheral nerves
 - 3.1.1 Peripheral Neuropathies
 - 3.1.2 Causalgia
 - 3.1.3 Reflex sympathetic dystrophy
 - 3.1.4 Irradiation neuropathy
 - 3.1.5 Peripheral nerves tumors
 - 3.1.6 Traumatic, compressive and ischemic neuropathy
 - 3.1.7 Spinal radiculitis and radiculopathy
 - 3.1.8 Hereditary motor and sensory neuropathy
 - 3.1.9 Acute idiopathic polyneuritis/chronic
 - 3.1.10 Neuropathy due infections
 - 3.1.11 Vasculomotor Neuropathy due to systemic medical disorders
 - 3.1.12 Drug induced neuropathy
- 3.2 Disorders of Muscle
 - 3.2.1 Myotonic disorders
 - 3.2.2 Inflammatory disorders of the muscle
 - 3.2.3 Myasthenia gravis
 - 3.2.4 Endocrine and Metabolic Myopathies
 - 3.2.5 Muscular dystrophies

PART B

Unit 4: Infectious Disorder and Tumors

- 4.1 Meningitis
- 4.2 Encephalitis
- 4.3 Brain abscess
- 4.4 Syphilis
- 4.5 Herpes simplex
- 4.6 Chorea
- 4.7 Poliomyelitis
- 4.8 Tuberculosis
- 4.9 Transverse myelitis

- 4.10 Tumours of cranial bones
 - 4.10.1 Meningiomas
 - 4.10.2 Tumours in spinal
 - 4.10.3 Intra-cranial tumours
 - 4.10.4 Other space-occupying lesions

- 4.11 Intracranial abscess

Unit 5: Growth and development of child and nutritional deficiency and immunisation

- 5.1 Weight, height, circumference measurement related to age
- 5.2 Normal child and developmental milestones
- 5.3 Neonatal reflexes, factors, influencing growth and development, types of bodybuilt, physical examination of the child, growth patterns
- 5.4 Immunization

- 5.5 Deficiency and nutritional disorders

- 5.5.1 Normal nutrition requirement of a child,
- 5.5.2 Infant feeding and prevention of nutrition disorders,
- 5.5.3 Deficiency of vitamins and related disorders
- 5.5.4 Other Nutritional neuropathies

Unit 6: Surgeries

- 6.1 General principles of neurosurgery
- 6.2 Stereotactic surgeries
- 6.3 Operations of the discs –cervical and lumbar disc operation
- 6.4 Lumbar and cisternal punctures technique and complication
- 6.5 General rules of surgical repair of the peripheral nerves
- 6.6 Muscle lengthening/release operations
- 6.7 Spasticity reductions
- 6.8 Intensive Care Unit management of the neurologically Impaired Patient.

Reference Books

1. A.Whiteside, 1999, Facilitation Techniques Based on NDT. 1st Edition. Psychological Corp
2. A.J. Ayres, 2005, Sensory Integration and Child. 25th edition. Western Psychological Services.
3. A.C. Bundy, S.J. Lane, E Murray, 2002, Sensory Integration: Theory and Practice. 2nd Edition.F.A. Davis
4. Cash Text Book for Physiotherapists in Neurological Disorders-Jaypee Bros. Publication 5th edition
5. Proprioceptive Neuro Muscular Facilitation- By Herman Kabat,
6. Therapeutic Exercise –O` Sullivan, 6th edition
7. "Right In The Middle"-Patracia Devis,2nd edition
8. Stroke Rehabilitation--Margaret Johnson,3rd edition
9. Therapeutic Exercise –Basmajjian.,5th edition
10. Neurological Rehabilitation- Umphred, 6th edition
11. Neurological Physiotherapy-Problem solving approach: Susan Edwards, 2nd edition
12. Adult Hemiplegia: Evaluation and treatment: Bobath, 2nd edition
13. Palpation & assessment skills-Leon Chaitow, 2/e, Churchill Livingstone
14. Neuromusculoskeletal examination and assessment-Nicole J.Petty, Ann Moore, 2/e, Churchill Livingstone
15. Assessment of the Spine- Phillips S. Ebrall, Churchill Livingstone

Assessment Tools:

- Sessional tests
- Preliminary
- Assignment
- End Term Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional - I	25%
Sessional - II	25%
Preliminary Viva	35%
Assignment	15%

Articulation Matrix

PO- CO State ment (MPT 202)	P O1	P O2	P O3	P O4	P O5	P O8	P SO 1	P SO 2	P SO 3	P SO 4	P SO 5
MPT 202.1	3	- -	3	1	2	3	3	2	3	1	--
MPT 202.2	2	3	3	2	1	1	3	2	3	3	1
MPT 202.3	3	2	- -	2	2	3	3	2	3	- --	--
MPT 202.4	- --	2	2	1	3	3	3	3	3	3	1
MPT 202.5	1	3	2	1	3	3	2	3	2	- -	1
MPT 202.6	1	3	2	1	3	3	3	3	3	3	-- -

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 203: Physiotherapy Management in Neurological disorders

Periods/week
L: 3 T: 0
Credits
6
Duration of Examination: 3 Hrs

Max. Marks : 100
Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisite: Nil

Course Type: Core

Course Outcomes: Student will be able to

MPT 203.1 Understand the common medical, traumatic, and surgical conditions of neurology

MPT 203.2 Assess and evaluate various developmental disorders

MPT 203.3 Design and formulate the rehabilitation protocol for various conditions

MPT 203.4 Differentially diagnose various neurological conditions and assess

MPT 203.5 Know and understand the principles of clinical neuro diagnosis and investigation to enlist deficiencies.

MPT 203.6 Evaluate the outcome of applied rehabilitation plan

PART A

Unit 1: Congenital/hereditary disorders and Traumatic condition

1.1 Traumatic brain and spinal cord injury

1.1.1 Head Injury

1.1.2 Comatose patient

1.1.3 Closed skull fractures

1.1.4 Hematomas, subdural, epidural and intracerebral

1.1.5 Open cranio-cerebral injuries

1.1.6 Reconstruction operations in head injuries

1.1.7 Acute traumatic injuries

1.2 Congenital/hereditary disorders

1.2.1 Haematomyelia and acute central cervical cord injuries

1.2.2 Slow progressive compression of the spinal cord

1.2.3. Syringomyelia

1.2.4 Ischemia and infraction of the spinal cord and cauda equina

1.2.5 Spina bifida

1.2.6 Malformation of spine and spinal cord

1.2.7 Cerebral malformations

Unit 2: Disorder of central nervous system

2.1 Disorders of cranial nerves

2.2 Disorders of cerebral circulation-Stroke, Aneurysms, Thrombosis

2.3 Cerebellar disorders

2.3.1 Ataxia

2.3.2 Motor neuron disease

2.4. Demyelinating disorders

2.4.1 Multiple sclerosis

2.4.2 Diffuse sclerosis

2.5 Extra pyramidal disorders- Parkinsonism and Balance disorders

2.6 Epilepsy

2.7 Dementia

2.8 Alzheimer's disease

Unit 3: Growth and development of child and nutritional deficiency and immunisation

3.1 Weight, height, circumference measurement related to age

3.2 Normal child and developmental milestones

3.3 Neonatal reflexes, factors, influencing growth and development, types of bodybuilt, physical examination of the child, growth patterns

3.4 Immunization

3.5 Deficiency and nutritional disorders

3.5.1 Normal nutrition requirement of a child,

3.5.2 Infant feeding and prevention of nutrition disorders,

3.5.3 Deficiency of vitamins and related disorders

3.5.4 Other Nutritional neuropathies

Unit 4: Infectious Disorder and Tumors

4.1 Meningitis

4.2 Encephalitis

4.3 Brain abscess

4.4 Syphilis

4.5 Herpes simplex

4.6 Chorea

4.7 Poliomyelitis

4.8 Tuberculosis

4.9 Transverse myelitis

4.10 Tumors of cranial bones

4.10.1 Meningiomas

4.10.2 Tumors in spinal

4.10.3 Intra-cranial tumors

4.10.4 Other space-occupying lesions

4.11 Intracranial abscess

Unit 5: Disorders of muscle and peripheral nerves

5.1 Disorders of peripheral nerves

5.1.1 Peripheral Neuropathies

5.1.2 Causalgia

5.1.3 Reflex sympathetic dystrophy

5.1.4 Irradiation neuropathy

5.1.5 Peripheral nerves tumors

5.1.6 Traumatic, compressive and ischemic neuropathy

5.1.7 Spinal radiculitis and radiculopathy

5.1.8 Hereditary motor and sensory neuropathy

5.1.9 Acute idiopathic polyneuritis/chronic

5.1.10 Neuropathy due infections

5.1.11 Vasculomotor Neuropathy due to systemic medical disorders

- 5.1.12 Drug induced neuropathy
- 5.2 Disorders of Muscle
 - 5.2.1 Themyotonic disorders
 - 5.2.2 Inflammatory disorders of the muscle
 - 5.2.3 Myasthenia gravis
 - 5.2.4 Endocrine and Metabolic Myopathies
 - 5.2.5 Muscular dystrophies

Unit 6: Surgeries

- 6.1 General principles of neurosurgery
- 6.2 Stereotactic surgeries
- 6.3 Operations of the discs –cervical and lumber disc operation
- 6.4 Lumbar and cisternal punctures technique and complication
- 6.5 General rules of surgical repair of the peripheral nerves
- 6.6 Muscle lengthening/release operations
- 6.7 Spasticity reductions
- 6.8 Intensive Care Unit management of the neurologically Impaired Patient.

Reference Books

1. Norris. CM, 2004, Sports Injuries Diagnosis and Management, 3rd Edition, Butterworth-Heinemann
2. Hoffman. Jay, 2014, Physical Aspects Of Sports Training and Performance, 2nd Edition, Human Kinetics.
3. Singh Yadvinder, 2005, Sports Psychology, 1st Edition, Sports Publication.
4. Jain R., 2005, Sports Medicine, 1st Edition, Khel Sahitya Kendra
5. Macually D and Best, 2007, Evidence Based Sports Medicine, 2nd Edition, BMJ Books
6. Jhonson R, 2000, Sports Medicine in Primary Care, 1st Edition, Saunders.
7. Subotnic S, 1998, Sports medicine of the lower extremity: An Integrative Medical Approach, 1st Edition, Churchill Livingstone.
8. Mark D Miller, Richard F Howard and Kevin D Plancher, 2003, Surgical atlas of sports medicine, 1st Edition, Saunders.
9. A.Whiteside, 1999, Facilitation Techniques Based on NDT. 1st Edition. Psychological Corp
10. A.J. Ayres, 2005, Sensory Integration and Child. 25th edition. Western Psychological Services.
11. A.C. Bundy, S.J. Lane, E Murray, 2002, Sensory Integration: Theory and Practice. 2nd Edition.F.A. Davis
12. D.Butler, 2005, Neurodynamics Techniques. 1st Edition. Orthopedic Physical Therapy Products
13. J.Koury, 1996, Aquatic Therapy programming: Guidelines for Orthopedic Rehabilitation. 1st Edition. Human Kinetics

Assessment Tools:

- Sessional tests
- Preliminary
- Assignment
- End Term Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional - I	25%
Sessional - II	25%
Preliminary Exam	35%
Assignment	15%

Articulation Matrix

PO -CO Stat eme nt (MP T- 203)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
MP T 203. 1	3	-	3	-	1	2	3	-	1	2	2	-	3
MP T 203. 2	3	3	3	2	1	3	3	-	3	2	2	2	3
MP T 203. 3	3	3	3	3	2	3	3	1	2	3	3	3	3
MP T 203. 4	3	2	3	3	2	3	3	-	3	3	2	1	3
MP T 203. 5	2	-	3	2	-	3	2	-	3	3	2	-	3
MP T 203. 6	2	2	3	2	3	3	3	-	3	3	2	-	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 204: Recent Advances in Neuro-Physiotherapy

Periods/week
L: 2 T: 0
Credits
4
Duration of Examination: 3 Hrs

Max. Marks : 100
Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisite: Nil

Course Type: Core

Course Outcomes: Student will be able to

MPT 204.1. Develop skills related to psychological interviewing and knowledge of the theoretical and empirical underpinnings of evidence- based approaches to psychological interventions.

MPT 204.2. Acquaint the students with various concepts of soft tissue mobilization techniques.

MPT 204.3. Acquire knowledge about virtual reality and robotic intervention in neurorehabilitation.

MPT 204.4. Learn the assessment of core.

MPT 204.5. Understand the Physiological and therapeutic principles of stabilization and Pilates.

MPT 204.6. Learn and develop the skills of neuro-therapeutics interventions.

PART-A

Unit 1: Neuro-psychological Therapies

- 1.1 Cognitive rehabilitation
- 1.2 Behavioral Therapy
- 1.3 Stress management strategies
- 1.4 Functional and Remedial Techniques

Unit 2: Advanced soft tissue mobilization Technique

- 2.1 Myofascial release technique
 - 2.1.1 Principle and technique
 - 2.1.2 Trigger point assessment
 - 2.1.3 Myofascial pain Syndrome
 - 2.1.4 Concept of Myofascial cycle
 - 2.1.5 Myofascial Release technique for various syndrome
- 2.2 Cyriax concept and technique
 - 2.2.1 Principles of Diagnosis
 - 2.2.2 Principles of Treatment
 - 2.2.3 Cyriax techniques for peripheral joints
 - 2.2.4 Cyriax techniques for spine
 - 2.2.5 Capsular stretching
 - 2.2.6 Soft tissue manipulation by cyriax

Unit 3: Virtual Reality and Robotics in Neuro-rehabilitation

- 3.1 Virtual Reality - Medical Games, Immersive approaches
- 3.2 Robotics and Haptics -simulation -- understanding motivational aspects of rehabilitation
- 3.3 Concept and Principle of Lumosity

PART B

Unit 4-Core Stabilization

- 4.1 Segmental Stabilization Concepts of Spine
- 4.2 Muscle function in spinal stabilization
- 4.3 Contribution of various muscles to spinal stabilization
- 4.4 Local Muscle dysfunction in Low back pain
- 4.5 Principles of clinical management of deep muscle system for
- 4.6 segmental stabilization
- 4.6 Core stability exercise

Unit 5: Pilates

- 5.1 Introduction
- 5.2 Principle & Technique
- 5.3 Types of Pilates
- 5.4 Pilates for different sports

Unit 6 -Neurotherapeutic manual Techniques

- 6.1 Butler principles and concept
- 6.2 Neurophysiology and neurodynamics
- 6.3 Clinical neurobiomechanics
- 6.4 Neural tension and mobilization-upper limb and lower limb
- 6.5 Different schools of thoughts for neural mobilization techniques

Recommended books:

- 1 J. Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques. 1st Edition. North Atlantic Books.
- 2 E. Cara, A. MacRae, 2004, Psychosocial Occupational Therapy: A Clinical Practice. 2nd Edition. Delmar Cengage learning
- 3 C. Manheim, 2008, The Myofascial Release Manual. 4th Edition. SLACK Incorporated
- 4 M. Sohlberg, 2001, Cognitive Rehabilitation: An Integrative Neuropsychological Approach. 2nd Edition. Guilford Press.
- 5 E.C. Haskins, L.E. Trexler, A. Shapiro-Rosenbaum, K. Dams-O'Connor, R. Eberle, 2012, Cognitive Rehabilitation Manual: Translating Evidence-Based Recommendations into Practice. 1st Edition. ACRM Publishing

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Assessment Tools:

- Sessional tests
- Preliminary
- Assignment
- End Term Examination

Parameter of Continuous Evaluation:

Sessional - I	25%
Sessional - II	25%
Preliminary Exam	35%
Assignment	15%

Articulation Matrix

P O- CO Stat eme nt (MP T- 204)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
M PT 204 .1	3	-	3	-	1	2	3	-	1	2	2	-	3
M PT 204 .2	3	3	3	2	1	3	3	-	3	2	2	2	3
M PT 204 .3	3	3	3	3	2	3	3	1	2	3	3	3	3
M PT 204 .4	3	2	3	3	2	3	3	-	3	3	2	1	3
M PT 204 .5	2	-	3	2	-	3	2	-	3	3	2	-	3
M PT 204 .6	2	2	3	2	3	3	3	-	3	3	2	-	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 205 Practical

Periods/week	Credits	Max. Marks : 150
P:2 T: 0	2	Continuous Evaluation: 50
Duration of Examination: 3 Hrs		End Semester Examination : 100

Pre-requisite: Nil

Course Type: Skill Development course

Course Outcomes: Students will be able to:

MPT 205.1 Formulate various techniques of stress management and cognitive behavioural therapy.

MPT 205.2 Understand the common medical, traumatic and surgical condition in neurology and their therapeutic model for the treatment

MPT 205.3 Design and formulate the rehabilitation protocol for various conditions in collaboration with various robotic and artificial intelligence techniques

MPT 205.4 Integrating knowledge of various soft tissue manipulation techniques in various neurological cases

MPT 205.5 Implementing the techniques of core stabilisation and neurodynamic to rehabilitate the individual with various neurological disorders

MPT 206.6 Identifying the basis needs of the individual with neurological disorders and **modifying** the environment according to the needs

Related of assessments, investigations and Physiotherapy management of all the above condition Students will be judged on one elective and one non- elective case. They will be expected to asses, diagnose and plan effective treatment plan for both cases

Recommended Books:

1. B.Bobath, 1978, Adult Hemiplegia: Evaluation and treatment.2nd edition. Butterworth Heinemann Ltd.
2. S. Adler, S.Domenick,B.Math,2000, PNF in Practice: An Illustrated Guide. 3rd Edition. Springer-Verlag Berlin Heidelberg
3. M. Hollis, P. Cook,1999,Practical Physical Therapy.4th Edition. Wiley
4. S. O'Sullivan, T. Schmitz 2013, Physical Rehabilitation.6th edition.F.A. Davis Company
5. D. Umphred, R. Lazaro, G. Burton, M. Roller 2012, Neurological Rehabilitation.6th edition. Mosby
6. S. Edwards, 2001, Neurological Physiotherapy-Problem solving approach.2nd edition. Churchill Livingstone
7. J. Maitland, 2001,Spinal manipulation made simple-A manual of soft tissue techniques. 1st Edition. North Atlantic Books.
8. E. Cara, A. MacRae, 2004, Psychosocial Occupational Therapy: A Clinical Practice.2nd Edition. Delmar Cengage learning
9. C. Manheim, 2008, The Myofascial Release Manual. 4th Edition. SLACK Incorporated
10. M. Sohlberg, 2001, Cognitive Rehabilitation: An Integrative Neuropsychological Approach.2nd Edition. Guilford Press.
11. E.C. Haskins, L.E. Trexler, A.Shapiro-Rosenbaum, K.Dams-O'Connor, R. Eberle, 2012, Cognitive Rehabilitation Manual: Translating Evidence-Based Recommendations into Practice.1st Edition.ACRM Publishing

Assessment Tools:

- Practical Viva(I and II)

- Preliminary
- File/Log Book
- End Term Examination

Parameter of Continuous Evaluation:

Viva - I	50%
Viva - II	50%
Preliminary Viva	35%
File/ Log Book	15%

Articulation Matrix

PO-CO Statement (MPT 205)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P SO 1	P SO 2	P SO 3	P SO 4	P SO 5
MPT 205.1	3	-	3	-	1	2	3	-	1	2	2	-	3
MPT 205.2	3	3	3	2	1	3	3	-	3	2	2	2	3
MPT 205.3	3	3	3	3	2	3	3	1	2	3	3	3	3
MPT 205.4	3	2	3	3	2	3	3	-	3	3	2	1	3
MPT 205.5	2	-	3	2	-	3	2	-	3	3	2	-	3
MPT 205.6	2	2	3	2	3	3	3	-	3	3	2	-	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 206: SEMINARS/ CASE PRESENTATION

Periods/week

Max. Marks :100

Credits

P: 6 T: 0

C:6

Continuous Evaluation: 100

Duration of Examination: NA

Pre-requisites: Nil

Course Type: Skill Development Course

Course Outcomes: The students will be able to

MPT 206.1 Enhance applied communication abilities of the students

MPT 206.2 Enhance personal effectiveness by raising awareness about self

MPT 206.3 Enhance way of physical and verbal presentation and efficiently manage self in front of others.

MPT 206.4 Develop the right attitude towards work and life to increase efficiency, reduce stress and increase happiness quotient

Distribution of Continuous Assessment

Knowledge about the presentation	25%
Presentation by the student	25%
History taking, points covered by the students	25%
Class Performance	25%

Articulation Matrix

PO -CO Stat eme nt (MP T 206)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
MP T 206. 1	1	-	-	1	-	-	3	1	-	-	1	-	-
MP T 206. 2	1	2	1	1	2	1	2	3	2	1	1	2	1
MP T 206. 3	-	-	1	-	-	1	1	-	1	1	-	-	1
MP T 206. 4	-	2	2	1	2	2	2	-	1	2	1	2	2

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES
(Deemed to be University under section 3 of the UGC Act, 1956)
MPT 207: DISSERTATION PROJECT WORK (BASED ON CLINICAL/CASE PRESENTATION INCLUDING VIVA VOCE)

Periods/week	Max. Marks : 100
Credits	
L: 0 P: 36	Continuous Evaluation: 20
6	
Duration of Examination: NA	End Semester Examination : 80

Pre-requisites: Nil

Course Type: Skill Development

Course Outcomes: Students will be able to

MPT 207.1 Develop insight of the student for research development and planning.

MPT 207.2 Monitor progress of the research work from inception to completion

MPT 207.3 Impart and uplift the concept of Evidence based practice.

Every candidate pursuing M.P.T degree course is required to carry out research work on selected topic. The result of such work shall be submitted in the form of research dissertation between 10,000 – 15,000 words. The dissertation is aimed to train a postgraduate student in research. This subject is divided into three parts, as follows:

- Dissertation should be completed within 10,000 – 15,000 words with total of six (6) copies (1 paperback, 5 head hard binding) & Manuscript (as prescribed by Research Committee) in a CD ROM (Soft copy) should be submitted to the Head of Physiotherapy department one month before the final university examinations.
 - After the completion of research dissertation, the student has to present / read his or her work in minimum NATIONAL level SCIENTIFIC CONFERENCE.
 - Distribution of six (5) copies of dissertation:
 - 1-University Copy (Paperback)
 - 1-Department Copy (Head hard)
 - 1-Supervisor Copy (Head hard)
 - 1-Supervisor Copy (Head hard)
 - 1-Personal Copy (Head hard)
 - Presentation & Viva-voce carrying 200 marks (based on power point presentation & oral defense) with the University appointed End Semester Exam Examiner and Internal/Continuous Assessment Evaluation of total 200 marks by Internal/Continuous Assessment Research Committee.
 - Dissertation viva-voce will be based on research dissertation and power point presentation of the same.
 - Criteria for End Semester Exam Examiner – all post graduate examiner passed master's degree shall be recognized as post graduate teacher holding recognized post graduate qualification in the subject concerned with minimum three years P.G teaching experience working in an educational institution / university. The department shall seek the biodata of examiner for confirmation.
- Number of examiner per practical- there shall be 2 examiners, one Internal/Continuous Assessment and one End Semester Exam.
 - Internal/Continuous Assessment – same college / department
 - End Semester Exam – any outside college and university other than MRIIRS

Note: Dissertation Guidelines will be available at Departmental Library and with the Research Coordinator.

Parameters of continuous Assessment

Class performance	25%
Knowledge about the ongoing project	25%
Initiative & Presentation by the student	25%
Conduct, behavior & sincerity of the student	25%

Course Articulation Matrix

PO-CO Statement (MPT 207)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P SO 1	P SO 2	P SO 3	P SO 4	P SO 5
MPT 207.1	3	-	3	-	1	2	3	-	1	2	2	-	3
MPT 207.2	3	3	3	2	1	3	3	-	3	2	2	2	3
MPT 207.3	3	3	3	3	2	3	3	1	2	3	3	3	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 301: ASSESSMENT AND DIGNOSIS OF MUSCULOSKELETAL CONDITIONS

Periods/week Credits
L: 2; P: 2; 2
Duration of Examination: 3 Hrs

Max. Marks : 100
Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisites: Nil

Course Type: Core

Course Outcomes: Students will be able to

MPT 301.1 Articulate various concepts of assessment and diagnosis of musculoskeletal conditions.

MPT 301.2 Integrate the skills of assessment with different musculoskeletal conditions.

MPT 301.3 Exemplify the abilities in accordance with the differential diagnosis based on the patient's history, evaluation, and demographic characteristics.

MPT 301.4 Evaluate the outcome and adverse effects of therapy based on patient input, validated outcome measurement instruments, and professional judgement.

MPT 301.5 Create appropriate treatment plan based on scientific evidence, clinical judgement.

MPT 301.6 Develop in-depth knowledge of patient management.

PART-A

Unit 1: Orthopedic Assessment

- 1.1 Patient History
- 1.2 Observation
- 1.3 Examination-Active and Passive Movements, functional Assessment, Special Tests, Reflexes and
- 1.4 Cutaneous Distribution, Joint Play Movements Palpation
- 1.5 Gait-Definitions, Gait Cycle, Abnormal Gait patterns
- 1.6 Posture-Normal and Abnormal, Spinal Deformities

Unit 2: Disability evaluation

- 2.1 Disability Evaluation
- 2.2 Assessment of Amputees
- 2.3 Examination and Assessment of Geriatric patient

Unit 3: Spinal Examination with Special Emphasis on Special Test:

- 3.1 Head and Face
- 3.2 Cervical Spine
- 3.3 Thoracic Spine
- 3.4 Lumbar Spine
- 3.5 Pelvis

Unit 4: Upper limb Examination with Special Emphasis on Special Test:

- 4.1 Shoulder
- 4.2 Elbow
- 4.3 Forearm, Wrist and Hand

Unit 5: Lower limb Examination with Special Emphasis on Special Test:

- 5.1 Hip

- 5.2 Knee
- 5.3 Lower Leg, Ankle and foot

Unit 6: Orthopedic Diagnosis

- 6.1 Biomechanical measurements –Limbs and Spine
- 6.2 Hematology and serology
- 6.3 Biopsy
- 6.4 Plain Radiography
- 6.5 Contrast Radiography
- 6.6 Myelography
- 6.7 Radioactive Scanning
- 6.8 Discography
- 6.9 Tomography
- 6.10 Magnetic Resonance Imaging
- 6.11 Arthroscopy
- 6.12 Electromyography, Nerve Conduction Velocity, Strength Duration Curve
- 6.13 BMO- Bone Densitometry- Ultrasound Densitometer and Dual Energy X-ray Absorptiometry (DEXA)

Recommended Text Books:

1. B. A. Shastri 2005, Manipal Manual of Clinical Medicine. 2nd Edition CBS publishers.
2. R. McRae, Clinical Orthopedic Examination.6th Edition. Churchill Livingstone Publication.
3. L. Chaitow 2010, Palpation & assessment skills. 2nd Edition. Churchill Livingstone Publication.
4. P.S. Ebrall, Assessment of the Spine. 2nd Edition Churchill Livingstone Publication.
5. J. E. Cash and P.A. DownieCash Text Book of Orthopaedics& Rheumatology for Physiotherapists.1stEdition.Mosby Publication.
6. Fredy Kaltenborn. Maitland Manual Mobilization Of Extremity Joints. 7thEdition .Orthopedic Physical Therapy Publication.
7. C. Adams, 2016, Adams Outline of Orthopedics by. 14th Edition. Churchill Livingstone Publication.
8. J. Maheshwari 2017, Essential Orthopaedics.5th Edition .Jaypee Brothers Medical Publishers
9. Solomon, 2015, Apley's System of Orthopaedics and Fractures by. 10thEdition. CRC Press Publication.
10. John Ebnezar, 2018, Textbook of Orthopedics.4thEdition.Jaypee Brothers Medical Publication.

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Outcome Matrix

P O- CO Stat em ent (MP T 301)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
M PT 301 .1	3	- -	3	1	2	- -	- -	3	3	2	3	1	- -
M PT 301 .2	2	3	3	2	1	1	2	1	3	2	3	3	1
M PT 301 .3	3	2	- -	2	2	- -	2	3	3	2	3	- --	- -
M PT 301 .4	- --	2	2	1	3	1	2	3	3	3	3	3	1
M PT 301 .5	1	3	2	1	3	1	2	3	2	3	2	- -	1
M PT 301 .6	1	3	2	1	3	- --	- --	3	3	3	3	3	- --

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 302: MEDICAL AND SURGICAL MANAGEMENT OF MUSCULOSKELETAL CONDITIONS

Periods/week Credits

L: 2; P: 0; 2

Duration of Examination: 3 Hrs

Max. Marks : 100

Continuous Evaluation: 20

End Semester Examination : 80

Pre-requisites: Nil

Course Type: Core

Course Outcomes: Students will be able to

MPT 302.1 Develop the understanding of general musculoskeletal disorders and rationalizes treatment selections for effective management of various musculoskeletal disorders.

MPT 302.2 Acquire knowledge about disorders and management of various conditions of upper and lower quadrant of the body including the spinal segments.

MPT 302.3 Develop in-depth understandings of traumatic musculoskeletal disorders & plan an individualized goals for various traumatic Musculoskeletal Conditions.

MPT 302.4 Acquire the knowledge about conservative & surgical management of the musculoskeletal conditions as relevant to physiotherapy

MPT 302.5 Understand surgical intervention related to amputation and be able to plan management for amputation.

MPT 302.6 Focus on health promotion, disease prevention, and treatment throughout a lifespan & knowledge of specific exercises in geriatric care.

PART-A

UNIT 1- General Orthopaedics

- 1.1 Infection Disorders of the Bones and Joints
- 1.2 Metabolic Disorders of the bones and joints
- 1.3 Congenital Disorders of the bones and joints
- 1.4 Inflammation of the bones and joints
- 1.5 Degeneration of the bones and joints
- 1.6 Developmental of the bones and joints
- 1.7 Connective tissue Disorders
- 1.8 Neuromuscular disorders
- 1.9 Tumors of bones
- 1.10 Complex Regional Pain Syndrome
- 1.11 Myopathies
- 1.12 Burns

UNIT 2- Regional Orthopaedics

- 2.1 Disorders of Upper Limb
- 2.2 Disorder of the Lower Limb
- 2.3 Disorder of Spine

UNIT 3-Traumatology (Fractures, Subluxations, Dislocations and soft tissue injury)

- 3.1 Trauma of the upper limb
- 3.2 Trauma of the lower limb
- 3.3 Trauma of the spine
- 3.4 Peripheral Nerve Injuries

PART-B

UNIT 4-Orthopaedic Surgeries

- 4.1 Osteotomy
- 4.2 Arthrodesis
- 4.3 Arthroplasty
- 4.4 Tendon transfers, repairs and grafting
- 4.5 Nerve Suturing
- 4.6 Soft tissue release
- 4.7 Spinal Stabilization
- 4.8 Spinal Fusion
- 4.9 Discectomy
- 4.10 Laminectomy
- 4.11 Reattachment of Limbs
- 4.12 Illizarou's technique
- 4.13 Meniscectomy

UNIT 5- Amputation

- 5.1 Types, Level and Procedure
- 5.2 Preoperative, operative and Prosthetic Management
- 5.3 Prevention and Treatment of complication

UNIT 6- Geriatric Care

- 6.1 Examine and assessment of geriatric Patient
- 6.2 Disorders specific to ageing

Text Books/References Book:

1. K.E. Barret, 2015, Ganong's Review of Medical Physiology. 25th Edition. McGraw Hill Education
2. E.R. Burke, 1998, Precision Heart rate training. 1st Edition. Human Kinetics.
3. W.E. Prentice, 2020, Rehabilitation Techniques for Sports Medicine and Athletic Training. 7th Edition. SLACK Incorporated.
4. O' Sullivan & T.J. Schmitz, 2013, Physical Rehabilitation. 7th Edition. Jaypee Publishers.
5. J. Andrews, G. Harrelson & K.Wilk, 2012, Physical Rehabilitation of Injured Athlete. 4th Edition. Elsevier.
6. M. Zulunga, 1995, Sports Physiotherapy: Applied Science and Practice. 1st Edition. Churchill Livingstone.
7. D.C. Reid, 1992, Sports Injury Assessment and Rehabilitation. 1st Edition. Churchill Livingstone.
8. W.A. Lillegard & K.S.Rucker, 1999, Handbook of Sports Medicine: A symptom-Oriented Approach. 2nd Edition. Butterworth-Heinemann Ltd.
9. P.Brunker & K.Khan, 2019, Clinical Sports Medicine: The Medicine of Exercise. 6th Edition. McGraw-Hill Education.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix

PO -CO Stat eme nt (MP T 302)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
MP T 302. 1	3	-	3	1	-	3	3	-	3	2	1	-	2
MP T 302. 2	3	-	3	-	1	3	3	-	3	2	-	-	2
MP T 302. 3	3	-	3	-	2	3	2	-	2	3	1	-	2
MP T 302. 4	2	-	3	-	2	2	2	-	3	2	2	-	2
MP T 302. 5	2	-	3	-	2	3	3	-	3	2	2	-	2
MP T 302. 6	1	-	3	1	2	2	3	-	3	2	3	1	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 303: Physiotherapy Management in Musculoskeletal Conditions

Periods/week Credits
L: 2; P: 0; 2
Duration of Examination: 3 Hrs

Max. Marks : 100
Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisite: Nil

Course Type: Core

Course Outcomes: Student will be able to

MPT 303.1 Understand the different general & regional musculoskeletal conditions .

MPT 303.2 Gain Knowledge and learn the basis for Injury Prevention and Management in musculoskeletal trauma .

MPT 303.3 Learn and Apply the different evaluation and management techniques used in musculoskeletal conditions.

MPT 303.4 Know & understand the risk associated with different musculoskeletal condition.

MPT 303.5 Understand the essentials of geriatric care.

MPT 303.6 Apply various Manual Therapy techniques in musculoskeletal conditions.

Unit 1: General Orthopedics

- 1.1 Congenital anomalies : Upper limb, Lower limb, Spine
- 1.2 Metabolic conditions affecting bones and joints: Parathyroid bone diseases (osteoporosis, algal dystrophy, heterotopic classification-ossification), Osteomalacia and Rickets, Scurvy
- 1.3 Infection Disorders of the bones and joints: Osteomyelitis, Infective Arthritis, Tuberculosis
- 1.4 Connective tissue disorders: Rheumatoid Arthritis, Ankylosing Spondylitis, Psoriatic arthritis, Scleroderma, Dermatomyositis
- 1.5 Bone Tumors: Benign Tumors, Malignant Tumors, Metastatic Tumors
- 1.6 Development disorders of the Bones: Cartilage dysplasia, Bony dysplasia
- 1.7 Neuromuscular Disorders: Poliomyelitis, Muscular dystrophies, Leprosy

Unit 2: Traumatology

- 2.1** Fractures, Subluxation, Dislocations and Soft tissue injury: Trauma of the upper Limb,
- 2.2** Trauma of the Lower Limb,
- 2.3** Trauma of the spine
- 2.4** Peripheral Nerve and Vascular Injuries

Unit 3: Regional Orthopaedics: Classification, Clinical Features, pathogenesis, complications and management of

- 3.1 Disorders of Upper Limb,
- 3.2 Disorders of Lower Limb,
- 3.3 Disorders of Spine

Unit 4: Amputation & Orthopedic Surgeries

- 4.1 Amputation : Classification, Preoperative and treatment of complications
- 4.2 Osteotomy
- 4.3 Arthrodesis
- 4.4 Arthroplasty
- 4.5 Tendon transfers, repairs and grafting
- 4.6 Nerve Suturing

- 4.7 Soft tissue release
- 4.8 Spinal fusion, Discectomy , Laminectomy
- 4.9 Reattachment of limbs
- 4.10 Illizarov' s technique
- 4.11 Menisectomy

Unit 5: Geriatrics Care:

- 51 Examine and assessment of geriatric patient
- 52 Disorders specific to ageing

Unit 6: Advance Manual Therapy

- 6.1 Manual Therapy: Introduction, History, Basic Classification Assessment for manipulation,discussion in brief about the concepts of mobilization & Special techniques like Cyriax, Maitland,Mulligan, Buttler, Kaltenborn, Mckenzie.
- 6.2 Muscle Energy techniques and positional stretch: The basic concept and application of these techniques.
- 6.3 Positional Release Therapy: The basic concept and Application of these techniques.
- 6.4 Myofascial Release: Concept and Application.
- 6.5 Nerve Conduction Studies and Electromyography: normal, abnormal action potential, its recording protocols, analysis, application.
- 6.6 Bio-feed back

Reference Books:

1. Downie, P. A., & Tidswell, M. E. (1992). *Cash's Textbook of orthopaedics and rheumatology for physiotherapists*. Mosby-Year Book Europe Limited.
2. Ansari, A. (2004). *Hand Therapy: Principles and Practice*: Maureen Salter, Lynn Cheshire (Eds.), Butterworth-Heinemann, Oxford, 2000.
3. B.A.Shastry 2013 *Manipal Manual of Clinical Medicine*, CBS publishers.
4. Ronald McRae 2003 *Clinical Orthopedic Examination* 4th Edition Churchill Livingstone
5. Deig. D., 2006, *Positional Release Techniques from a Dynamic Systems Perspective*, 1st Edition, Somatic Publications
6. Chaitow. L., 2013, *Muscle Energy Techniques*, 4th Edition, Elsevier Health – UK.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Instruction for paper setting: Question no 1 will be compulsory for all candidates. It will consist of very short questions from entire syllabus of 20 marks. In Part A student will be required to answer 6 long questions out of 7 each of 15 marks. In Part B also student will be required to answer 2 long questions out of 3 each of 15 marks.

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Articulation Matrix

P O- CO Stat eme nt (MP T- 303)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
M PT- 303 .1	3	3	-	1	-	1	2	3	3	2	-	-	2
M PT- 303 .2	-	3	3	1	3	-	1	-	2	-	-	-	3
M PT- 303 .3	1	-	3	1	2	-	-	3	3	2	2	1	3
M PT- 303 .4	-	2	2	1	3	1	2	3	2	3	-	2	3
M PT- 303 .5	1	3	-	-	-	3	-	1	1	2	-	2	2
M PT- 303 .6	1	3	2	1	3	-	-	3	-	2	-	2	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 304: Recent Advances in Musculoskeletal Physiotherapy

Periods/week Credits

L: 2; P: 0; 4

Duration of Examination: 3 Hrs

Max. Marks : 100

Continuous Evaluation: 20

End Semester Examination : 80

Pre-requisites: Nil

Course Type: Core

Course Outcomes: Students will be able to

MPT 304.1.To **acquaint** the students with various concepts of soft tissue mobilization techniques.

MPT 304.2.To **assess** and **implement** the use of various manual muscle techniques.

MPT 304.3.To **impart** foundation basis for injury prevention and management.

MPT 304.4.To **enhance** the understanding of the functioning of the core.

MPT 304.5.To **understand** the Physiological and therapeutic principles of stabilization and Pilates.

MPT 304.6.To **learn** and **develop** the skills of neuro-therapeutics interventions.

Unit I: Advanced soft tissue mobilization Techniques

1.1 Myofascial release technique

1.1.1 Principle and technique

1.1.2 Trigger point assessment

1.1.3 Myofascial pain Syndrome

1.1.4 Concept of Myofascial cycle

1.1.5 Myofascial Release technique for various syndromes

1.2 Cyriax concept and technique

1.2.1 Principles of Diagnosis

1.2.2 Principles of Treatment

1.2.3 Cyriax techniques for peripheral joints

1.2.4 Cyriax techniques for spine

1.2.5 Capsular stretching

1.2.6 Soft tissue manipulation by cyriax

Unit II: Manual Mobilization Techniques

2.1. Muscle energy technique

2.1.1 Principles of MET

2.1.2 Types of MET

2.1.3 Techniques and application of MET

2.1.4 Lower quarter MET

2.1.5 Upper quarter MET

2.2. Positional release therapy

2.2.1 Principles of PRT

2.2.2 Variations of PRT

2.2.3 Technique and Application of PRT

2.2.4 Integrated Neuromuscular Inhibition technique

Unit III: Neurotherapeutic manual Techniques

- 3.1 Butler principles and concept
 - 3.1.1 Neurophysiology and neurodynamics
 - 3.1.2 Clinical neurobiomechanics
 - 3.1.3 Neural tension and mobilization-upper limb and lower limb
 - 3.1.4 Different schools of thoughts for neural mobilization techniques

Unit IV: Core Stabilization and Pilates

- 4.1 Segmental Stabilization Concepts of Spine
 - 4.1.1 Muscle function in spinal stabilization
 - 4.1.2 Contribution of various muscles to spinal stabilization
 - 4.1.3 Local Muscle dysfunction in Low back pain
 - 4.1.4 Principles of clinical management of deep muscle system for
 - 4.1.5 Segmental stabilization
 - 4.1.6 Core stability exercise
- 4.2 Pilates
 - 4.2.1 Introduction
 - 4.2.2 Principle & Technique
 - 4.2.3 Types of Pilates
 - 4.2.4 Pilates for different sports

Text Books/References Book:

1. J. Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques. 2nd Edition. North Atlantic Books.
2. C. J. Manheim, 2008, The Myofascial Release Manual. 4th Edition. SLACK Incorporated.
3. J. Langendoen, 2014, Kinesiology Taping: The Essential Step-By-Step Guide: Taping for Sports, Fitness and Daily Life, 1st Edition, Robert Rose Inc.
4. G. Cook, 2011, Movement: Functional Movement Systems: Screening, Assessment, Corrective Strategies. 2nd Edition. Lotus Publisher.
5. N. Swedan, 2001, Women's Sports Medicine and Rehabilitation, 1st Edition, Aspen Publishers Inc.

Assessment Tools:

- Assignment/Tutorials
- Sessional tests
- Surprise questions during lectures/Class Performance
- End Semester Examination

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix

PO-CO Statement	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	O	O	O	O	O	O	O	O	P	S	S	S	S	P

(MPT 304)	1	2	3	4	5	6	7	0 8	0 1	0 2	0 3	0 4	S 0 5
MPT 304.1	3	3	-	1	-	1	2	3	3	2	-	2	3
MPT 304.2	-	3	3	1	3	-	1	-	1	-	-	2	1
MPT 304.3	1	-	3	1	2	-	-	3	3	3	-	1	-
MPT 304.4	-	2	2	1	3	1	2	3	3	3	2	3	3
MPT 304.5	1	3	-	-	-	3	-	1	-	1	-	-	3
MPT 304.6	1	3	2	1	3	-	-	3	3	3	1	-	-

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 305: PRACTICAL

Periods/week Credits
L: 0; P: 2; 2
Duration of Examination: 3 Hrs

Max. Marks : 150
Continuous Evaluation: 50
End Semester Examination : 100

Pre-requisites: Nil

Course Type: Core

Course Outcomes: Students will be able to

- MPT 305.1 Articulate various concepts of soft tissue mobilization techniques.
- MPT 305.2 Assess and implement the use of various muscle energy technique.
- MPT 305.3 Design the basis for Injury Prevention and Management.
- MPT 305.4 Develop in-depth knowledge of patient management with different techniques.
- MPT 305.5 Understanding of the Physiological and therapeutic principles various techniques.
- MPT 305.6 Combine the skills of therapeutics interventions with different musculoskeletal conditions.

PART-A

UNIT 1-Advanced soft tissue mobilization Techniques

Outline and Practical Knowledge of

- 1.1 Muscle Energy Techniques
- 1.2 Positional Stretch
- 1.3 Myofascial release etc

UNIT 2- Manual Mobilization Techniques

Demonstration and Practical Knowledge of

- 2.1 Cyriax
- 2.2 Maitland
- 2.3 Mulligan
- 2.4 Meckenzie

PART-B

UNIT 3-Neurotherapeutic manual Techniques

Demonstration and Practical Knowledge of

- 3.1 Butler
- 3.2 Nerve Mobilization

UNIT 4-Electrodiagnostic procedures

Demonstration and Practical Knowledge of

- 4.1 NCV, EMG
- 4.2 Biofeedback

Text Books/References Book:

1. J. Maitland, 2001, Spinal manipulation made simple-A manual of soft tissue techniques. 2nd Edition. North Atlantic Books.
2. C. J. Manheim, 2008, The Myofascial Release Manual. 4th Edition. SLACK Incorporated.

3. J. Langendoen, 2014, Kinesiology Taping: The Essential Step-By-Step Guide: Taping for Sports, Fitness and Daily Life, 1st Edition, Robert Rose Inc.
4. G. Cook, 2011, Movement: Functional Movement Systems: Screening, Assessment, Corrective Strategies. 2nd Edition. Lotus Publisher.
5. N. Swedan, 2001, Women's Sports Medicine and Rehabilitation, 1st Edition, Aspen Publishers Inc.

Assessment Tools:

- Sessional tests
- Preliminary Viva
- File and classwork
- End Term Examination

Parameter of Continuous Evaluation:

Viva- I	50%
Viva- II	50%
Preliminary Viva	35%
File work/log book	15%

Course Articulation Matrix

PO-CO Statement (MPT 305)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
MPT 305.1	3	3	-	1	-	1	2	3	3	2	-	2	3
MPT 305.2	-	3	3	1	3	-	1	-	1	-	-	2	1
MPT 305.3	1	-	3	1	2	-	-	3	3	3	-	1	-
MPT 305.4	-	2	2	1	3	1	2	3	3	3	2	3	3
MPT 305.5	1	3	-	-	-	3	-	1	-	1	-	-	3
MPT 305.6	1	3	2	1	3	-	-	3	3	3	1	-	-

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 306: SEMINARS/ CASE PRESENTATION

Periods/week

Max. Marks :100

Credits

P: 6 T: 0

C:6

Continuous Evaluation: 100

Duration of Examination: NA

Pre-requisites: Nil

Course Type: Skill Development Course

Course Outcomes: The students will be able to

MPT 306.1 Enhance applied communication abilities of the students

MPT 306.2 Enhance personal effectiveness by raising awareness about self

MPT 306.3 Enhance way of physical and verbal presentation and efficiently manage self in front of others.

MPT 306.4 Develop the right attitude towards work and life to increase efficiency, reduce stress and increase happiness quotient

Distribution of Continuous Assessment

Knowledge about the presentation	25%
Presentation by the student	25%
History taking, points covered by the students	25%
Class Performance	25%

PO-CO Statement (MPT 306)	P	P	P	P	P	P	P	P	P	P	P	P	P
	O	O	O	O	O	O	O	O	S	S	S	S	S
	1	2	3	4	5	6	7	8	1	2	3	4	5
MPT 306.1	1	-	-	1	-	-	3	1	-	-	1	-	-
MPT 306.2	1	2	1	1	2	1	2	3	2	1	1	2	1
MPT 306.3	-	-	1	-	-	1	1	-	1	1	-	-	1
MPT 306.4	-	2	2	1	2	2	2	-	1	2	1	2	2

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES
(Deemed to be University under section 3 of the UGC Act, 1956)
MPT 307: DISSERTATION PROJECT WORK (BASED ON CLINICAL/CASE PRESENTATION INCLUDING VIVA VOCE)

Periods/week	Max. Marks : 100
Credits	
L: 0 P: 36	Continuous Evaluation: 20
6	
Duration of Examination: NA	End Semester Examination : 80

Pre-requisites: Nil

Course Type: Skill Development

Course Outcomes: Students will be able to

MPT 307.1 Develop insight of the student for research development and planning.

MPT 307.2 Monitor progress of the research work from inception to completion

MPT 307.3 Impart and uplift the concept of Evidence based practice.

Every candidate pursuing M.P.T degree course is required to carry out research work on selected topic. The result of such work shall be submitted in the form of research dissertation between 10,000 – 15,000 words. The dissertation is aimed to train a postgraduate student in research. This subject is divided into three parts, as follows:

- Dissertation should be completed within 10,000 – 15,000 words with total of six (6) copies (1 paperback, 5 head hard binding) & Manuscript (as prescribed by Research Committee) in a CD ROM (Soft copy) should be submitted to the Head of Physiotherapy department one month before the final university examinations.
 - After the completion of research dissertation, the student has to present / read his or her work in minimum NATIONAL level SCIENTIFIC CONFERENCE.
 - Distribution of six (5) copies of dissertation:
 - 1-University Copy (Paperback)
 - 1-Department Copy (Head hard)
 - 1-Supervisor Copy (Head hard)
 - 1-Supervisor Copy (Head hard)
 - 1-Personal Copy (Head hard)
 - Presentation & Viva-voce carrying 200 marks (based on power point presentation & oral defense) with the University appointed End Semester Exam Examiner and Internal/Continuous Assessment Evaluation of total 200 marks by Internal/Continuous Assessment Research Committee.
 - Dissertation viva-voce will be based on research dissertation and power point presentation of the same.
 - Criteria for End Semester Exam Examiner – all post graduate examiner passed master's degree shall be recognized as post graduate teacher holding recognized post graduate qualification in the subject concerned with minimum three years P.G teaching experience working in an educational institution / university. The department shall seek the biodata of examiner for confirmation.
- Number of examiner per practical- there shall be 2 examiners, one Internal/Continuous Assessment and one End Semester Exam.
 - Internal/Continuous Assessment – same college / department
 - End Semester Exam – any outside college and university other than MRIIRS

Note: Dissertation Guidelines will be available at Departmental Library and with the Research Coordinator.

Parameters of continuous Assessment

Class performance	25%
Knowledge about the ongoing project	25%
Initiative & Presentation by the student	25%
Conduct, behavior & sincerity of the student	25%

Course Articulation Matrix

PO-CO Statement (MPT 307)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P SO 1	P SO 2	P SO 3	P SO 4	P SO 5
MPT 307.1	3	-	3	-	1	2	3	-	1	2	2	-	3
MPT 307.2	3	3	3	2	1	3	3	-	3	2	2	2	3
MPT 307.3	3	3	3	3	2	3	3	1	2	3	3	3	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 501: Assessment and Diagnosis of Sports Injuries

Periods/week

Max. Marks : 100

Credits

L: 2; P: 0; 4

Duration of

Examination: 3 Hrs

Continuous Evaluation: 20
End Semester Examination : 80

Pre-requisites: Nil

Course Type: Program Core

Course Outcomes: The student will be able

MPT 501.1. Understand the role of assessment and evaluation in diagnosis of sports injuries.

MPT 501.2. Analyse the biomechanical abnormalities of sports activities.

MPT 501.3. Construct a detailed assessment profile of the sports athletes.

MPT 501.4. Discriminate and response to on-field and off-field medical emergencies to athletes.

MPT 501.5. Understand the different methods of diagnostics tools and techniques.

MPT 501.6. Distinguish different types of sports injuries and differentially diagnosed them with different methods.

PART A

UNIT 1. Orthopaedic/Sports assessment and evaluation

1. Assessment
 - 1.1 History taking
 - 1.2 Cause and mechanism of injury, preventive aspects of sports activity
 - 1.3 Specific risk factor, nature of sports
 - 1.4 Observation
 - 1.5 Physical Examination: Active and passive movements, functional assessment, special tests, reflexes and cutaneous distribution, joint play movements, palpation.
 - 1.6 Clinical decision making
 - 1.7 Immediately after injury
 - 1.8 Acute Stage
 - 1.9 Chronic Stage
 - 1.10 Rehabilitation Stage
 - 1.11 Biomechanical evaluation
 - 1.11.1 Running
 - 1.11.2 Jumping
 - 1.11.3 Throwing
 - 1.11.4 Swimming

Unit 2. Pre-participation Examination and Emergencies

- 2.1 Pre-participation Examination
 - 2.1.1 Goals and preparation for PPE
 - 2.1.2 Medical history
 - 2.1.3 Components of PPE
 - 2.1.4 Scope and implementation
- 2.2 On-field and off-field emergencies
 - 2.2.1 Emergency sport evaluation
 - 2.2.2 Primary and secondary emergency assessment
 - 2.2.3 Emergency plan

2.2.4 Transportation

MPRIIRS

Unit 3. Sports medicine diagnosis

- 3.1 Biomechanical measurement
 - 3.1.1 Limbs and spine
- 3.2 Radiography
- 3.3 Plain radiography, contrast radiography
- 3.4 Tomography: CT scan
- 3.5 Ultrasonography
- 3.6 MRI
- 3.7 Electrodiagnostic tools
- 3.8 EMG, NCV, SD curve
- 3.9 Bone mineral densitometry
- 3.10 Bone densitometry, ultrasound densitometry and DEXA
- 3.11 Arthroscopy
- 3.12 Serology and biopsy
- 3.13 Myelography and radioactive scanning

PART B

Unit 4. Regional Examination of upper extremity with special emphasis on special test and differential diagnosis of sports injuries.

- 4.1 Shoulder
- 4.2 Elbow
- 4.3 Forearm, wrist and hand

Unit 5. Regional Examination of lower extremity with special emphasis on special test and differential diagnosis of sports injuries

- 5.1 Hip
- 5.2 Knee
- 5.3 Lower leg, ankle and foot

Unit 6. Regional Examination of head, chest, abdomen and spine with special emphasis on special test and differential diagnosis of sports injuries

- 6.1 Head and face
- 6.2 Chest and Abdomen
- 6.3 Cervical, thoracic and lumbar spine
- 6.4 Pelvis

Text Books/References Book:

1. W.E. Prentice, 2020, Rehabilitation Techniques for Sports Medicine and Athletic Training. 7th Edition. SLACK Incorporated.
2. J. Andrews, G. Harrelson & K.Wilk, 2012, Physical Rehabilitation of Injured Athlete. 4th Edition. Elsevier.
3. M. Zulunga, 1995, Sports Physiotherapy: Applied Science and Practice, 1st Edition, Churchill Livingstone.
4. D.C. Reid, 1992, Sports Injury Assessment and Rehabilitation. 1st Edition. Churchill Livingstone.
5. W.A. Lillegard & K.S.Rucker, 1999, Handbook of Sports Medicine: A symptom-Oriented Approach. 2nd Edition. Butterworth-Heinemann Ltd.
6. P.Brunker & K.Khan, 2019, Clinical Sports Medicine: The Medicine of Exercise, 6th Edition. McGraw-Hill Education.

Assessment Tools:

- Sessional tests
- Assignment
- Surprise questions during lectures/Class Performance
- End Term Examination

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix

PO-CO Statement (MPT 501)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	PS O 1	P S O 2	P S O 3	P S O 4	P S O 5
BPT 501.1	3	-	3	1	2	-	-	3	3	2	3	1	-
BPT 501.2	2	3	3	2	1	1	2	1	3	2	3	3	1
BPT 501.3	3	2	-	2	2	-	2	3	3	2	3	-	-
BPT 501.4	-	2	2	1	3	1	2	3	3	3	3	3	1
BPT 501.5	1	3	2	1	3	1	2	3	2	3	2	-	1
BPT 501.6	1	3	2	1	3	-	-	3	3	3	3	3	-

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 502: Medical and Surgical Management of Sports Injuries

Periods/week Credits

L: 2; P: 0; 4

Duration of Examination: 3 Hrs

Max. Marks : 100

Continuous Evaluation: 20

End Semester Examination : 80

Pre-requisites: Nil

Course Type: Program Core

Course Outcomes: The student will be able

MPT 502.1 Understand the common medical issues faced by the athletes.

MPT 502.2 Identify the special needs for Female, Disabled & Adolescent athletes.

MPT 502.3 Gain knowledge about Doping & the emergency care

MPT 502.4 Assess the causes, prevention & rehabilitation of Sports injuries

MPT 502.5 Understand the injuries associated with different sports

MPT 502.6 Evaluate and Rehabilitate the region specific sports injuries

Unit 1: Medical Problem

- 1.1 Definition and terminology.
- 1.2 Medical problems of athletes – fungal infections, viral infections, common cold, diarrhoea, dysentery,
- 1.3 T.B., amoebiasis etc.

Unit 2: Special considerations:

- 2.1 Female athletes – sports amenorrhea, injury to female reproductive tract., menstrual asynchrony
- 2.2 Adolescent athlete
- 2.3 Disabled athlete

Unit 3: Doping & Athlete care

- 3.1 Doping amongst athletes
- 3.2 Protective equipment consideration
- 3.3 Emergency care, athletes first aid and cardiopulmonary resuscitation
- 3.4 Weight management

Unit 4: Sports injuries

- 4.1 Frequency and site if injury
- 4.2 Etiological factors.
- 4.3 Prevention of injury
- 4.4 Mechanism of injury
- 4.5 Role of teachers and coaches in prevention of injury
- 4.6 Physiology of sports rehabilitation

Unit 5: Sports specific injury pattern

- 5.1 Acute, overuse and traumatic injuries related to cricket
- 5.2 Acute, overuse and traumatic injuries related to judo
- 5.3 Acute, overuse and traumatic injuries related to throw ball
- 5.4 Acute, overuse and traumatic injuries related to basket ball
- 5.5 Acute, overuse and traumatic injuries related to discuss throw
- 5.6 Acute, overuse and traumatic injuries related to football
- 5.7 Acute, overuse and traumatic injuries related to baseball
- 5.8 Acute, overuse and traumatic injuries related to badminton
- 5.9 Acute, overuse and traumatic injuries related to tennis
- 5.10 Acute, overuse and traumatic injuries related to gymnastics
- 5.11 Acute, overuse and traumatic injuries related to javelin
- 5.12 Acute, overuse and traumatic injuries related to judo

Unit 6: Region Specific Sports injuries

- 6.1 Sports injuries of lower limb
- 6.2 Sports injuries of spine
- 6.3 Sports injuries of head and neck
- 6.4 Stroke management
- 6.5 Internal and external bleeding

Text Books/References Book:

1. Norris. CM, 2004, Sports Injuries Diagnosis and Management, 3rd Edition, Butterworth-Heinemann
2. Hoffman. Jay, 2014, Physical Aspects Of Sports Training and Performance, 2nd Edition, Human Kinetics.
3. Singh Yadvinder, 2005, Sports Psychology, 1st Edition, Sports Publication.
4. Jain R., 2005, Sports Medicine, 1st Edition, Khel Sahitya Kendra
5. Macually D and Best, 2007, Evidence Based Sports Medicine, 2nd Edition, BMJ Books
6. Jhonson R, 2000, Sports Medicine in Primary Care, 1st Edition, Saunders.
7. Subotnic S, 1998, Sports medicine of the lower extremity: An Integrative Medical Approach, 1st Edition, Churchill Livingstone.
8. Mark D Miller, Richard F Howard and Kevin D Plancher, 2003, Surgical atlas of sports medicine, 1st Edition, Saunders.

Assessment Tools:

- Sessional tests
- Assignment
- Surprise questions during lectures/Class Performance
- End Term Examination

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Course Articulation Matrix

P O- CO Stat em ent (MP T- 502)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
M PT- 502 .1	3	-	2	-	2	2	3	-	2	1	-	-	3
M PT- 502 .2	3	1	3	-	2	1	2	-	3	2	2	-	3
M PT- 502 .3	-	3	3	2	1	2	3	1	2	3	1	3	3

M PT- 502 .4	3	2	3	1	2	3	2	-	3	2	1	1	3
M PT- 502 .5	1	2	3	-	3	-	-	-	3	3	1	-	2
M PT- 502 .6	2	-	3	2	-	3	2	1	2	3	2	-	3

MR TIERS

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 503: Physiotherapy Management Sports Injuries

Periods/week Credits

L: 3; P: 0; 6

Duration of Examination: 3 Hrs

Max. Marks : 100

Continuous Evaluation: 20

End Semester Examination : 80

Pre-requisites: Nil

Course Type: Program Core

Course Outcomes: The student will be able

MPT 503.1 Understand the Psychology of a sports person.

MPT 503.2 Gain Knowledge and **learn** about the body composition and athletic care.

MPT 503.3 Learn and **Apply** different sports techniques used in prevention, training and rehabilitation of sports person.

MPT 503.4 Identify and **Apply** different instruments used in sports rehabilitation.

MPT 503.5 Understand the Biomechanical Principals of sports injuries.

MPT 503.6 Apply various Manual Therapy techniques in Rehabilitation of sports person.

Unit 1: Sports Psychology

- 1.1 Definition and Terminologies
- 1.2 Role of Sports Psychology in Sports performance
- 1.3 Instincts – Killer instincts and motivation
- 1.4 Attention, interests and motivation.
- 1.5 Personality of sports person-type, dynamic nature, factors affecting personality development, characteristics.
- 1.6 Role of sports in personality development
- 1.7 Learning relation to Sports:
 - Nature and meaning of learning and maturation.
 - Characteristics of learning
 - Laws of learning maturation
 - Transfer of Training
 - Emotions in Sports
 - Characteristics of emotions
 - Controlling and training of emotions
 - Sentiments- types, importance and formations
- 1.8 Mental Health
 - Concepts, Meaning and Importance
 - Characteristic of mentally healthy person/ athlete
 - Role of Physical Education in promotion of mental health
 - Factor affecting growth and development
- 1.9 Role of heredity
 - Character of growth
 - Heredity on relation to Environment
- 1.10 Group Behaviors and leadership in Sports
 - Nature of Group Behavior.
 - Type, quality, Training and Functioning of Leader performance
- 1.11 Anxiety, Model Stress and its Functioning of Leader performance
 - Isolate training
 - Sudden Change in Opponent
 - Audience Stress.
 - Strategy change
 - Cognitive Stress Modeling
- 1.12 Contemporary Stress Reduction Strategies

- Bio Feedback
- Mental Coping Strategies
- Visual Imagery
- Meditation and Yoga
- 1.13 Performance Factors
 - Stress and Performance
 - Motivation and performance

Unit 2: Body Composition & Athletic Care

- 2.1 Anthropometry
- 2.2 Protective Equipment Consideration
- 2.3 Emergency Care

Unit 3: Sports Techniques

- 3.1 Sports Massage and soft tissue manipulation
- 3.2 Splinting, Taping and Bandaging-techniques, indications and contra indications
- 3.3 Balance, co-ordination and PNF Techniques
- 3.4 Hydrotherapy
 - Jacuzzi
 - Sauna Bath and Spas
 - Moist Heat Chambers
 - Hot Showers
 - Health Club and fitness centers – Use and Misuse of Equipment's

Unit 4: Instrumentation in sports training and rehabilitation and medical condition

Physiotherapy

- 4.1 Iso Kinetic Exerciser.
- 4.2 Treadmill
- 4.3 Ergometer – Upper and Lower Limb
- 4.4 Body Fate Platform
- 4.5 Motion Analyser
- 4.6 Cardio-respiratory evaluation apparatus
- 4.7 Prevention and Rehabilitation of heart attack
- 4.8 Role of Physiotherapy Exercise in high blood pressure athlete
- 4.9 Role of Physiotherapy exercise in diabetic athlete
- 4.10 Role of Physiotherapy in different medical conditions
- 4.11 Physiotherapy of sports rehabilitation
- 4.12 Special Exercise programme for sports person

Unit 5: Bio mechanical principals for all sports injuries:

- 5.1 Bio mechanics and injuries related to cricket
- 5.2 Bio mechanics and injuries related to Judo
- 5.3 Bio mechanics and injuries related to Throw Ball
- 5.4 Bio mechanics and injuries related to Basket Ball
- 5.5 Bio mechanics and injuries related to Discus Throw
- 5.6 Bio mechanics and injuries related to Football
- 5.7 Bio mechanics and injures related to Base Ball
- 5.8 Bio mechanics and injuries related to Badminton
- 5.9 Bio mechanics and injuries related to Tennis
- 5.10 Bio mechanics and injuries related to Gymnastics
- 5.11 Bio mechanics and injuries related to Javelin
- 5.12 Bio mechanics and injuries related to Swimming
- 5.13 Bio mechanics and injuries related to Jumping Sports
- 5.14 Bio mechanics and injuries related to Track and Field Sports (Atheletics, Soccer, Hockey etc.)
- 5.15 Sports injuries of Upper Limb
- 5.16 Sports injuries of Lower Limb
- 5.17 Sports injuries of Lower limb

- 5.18 Sports injuries of Thorax, Spine
- 5.19 Sports injuries of Head and Neck

Unit 6: Advanced Manual Therapy

- 6.1 Manual Therapy – History, Basic Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization and special techniques like cyriax, Maitland, Mulligan, Butler, Kalternborn, Meckenzie.
- 6.2 Muscle energy techniques and positional stretch – Basic concepts and application of techniques.
- 6.3 Positional release therapy – Basic concepts and application of techniques
- 6.4 Myofascial techniques – Basic concepts and application of techniques
- 6.5 Nerve conduction studies and electromyography – normal , abnormal, action potential , its recording protocols analysis, applications.
- 6.6 Bio feedback

Text Books/References Book:

1. Norris. CM, 2004, Sports Injuries Diagnosis and Management, 3rd Edition, Butterworth-Heinemann
2. Hoffman. Jay, 2014, Physical Aspects Of Sports Training and Performance, 2nd Edition, Human Kinetics.
3. Macually D and Best, 2007, Evidence Based Sports Medicine, 2nd Edition, BMJ Books
4. Jhonson R, 2000, Sports Medicine in Primary Care, 1st Edition, Saunders.
5. Mark D Miller, Richard F Howard and Kevin D Plancher, 2003, Surgical atlas of sports medicine, 1st Edition, Saunders.
6. Deig. D., 2006, Positional Release Techniques from a Dynamic Systems Perspective, 1st Edition, Somatic Publications
7. Chaitow. L., 2013, Muscle Energy Techniques, 4th Edition, Elsevier Health – UK.
8. Singh Yadvinder, 2005, Sports Psychology, 1st Edition, Sports Publication.

Assessment Tools:

- Sessional tests
- Assignment
- Surprise questions during lectures/Class Performance
- End Term Examination

Parameter of Continuous Evaluation:

Sessional- I	25%
Sessional- II	25%
Assignment	15%
Preliminary Exam	35%

Articulation Matrix

P O- CO Stat em ent (MP T- 503)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
M PT- 503 .1	2	2	1	3	2	2	2	-	3	2	-	-	2
M PT- 503 .2	3	-	2		2	2	3	1	2	-	-	-	3
M PT- 503 .3	3	2	3	1	2	1	2	1	3	2	2	1	3
M PT- 503 .4	2	2	2	-	3	3	-	-	2	3	-	2	3
M PT- 503 .5	3	-	2	-	3	-	-	-	1	2	-	2	2
M PT- 503 .6	1	3	3	2	2	-	-	1	-	2	-	2	3

MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH AND STUDIES

(Deemed to be University under section 3 of the UGC Act, 1956)

MPT 504: Recent Advances in Sports Physiotherapy

Periods/week Credits

L: 2; P: 0; 4

Duration of Examination: 3 Hrs

Max. Marks : 100

Continuous Evaluation: 20

End Semester Examination : 80

Pre-requisites: Nil

Course Type: Core

Course Outcomes: Students will be able to

MPT 504.1. Demonstrate the knowledge of periodization and athletic training development and implementation

MPT 504.2. Assess and interpret the precision heart rate for athletic and sports training.

MPT 504.3. Understand the knowledge of core and **construct** a core program for athletes.

MPT 504.4. Relate and create sports training for athletes.

MPT 504.5. Apply the different taping techniques to athletes for therapeutic or prophylactic purposes.

MPT 504.6. Learn and develop the skills of neuro-therapeutics interventions.

PART A

Unit 1. Periodization

1. Principles, need and importance of periodization
2. Types of athletic training plan
 1. Macro, meso and micro cycles
 2. Training session plan
3. Annual training program
 1. Phases and characteristics
 2. Periodization for strength, endurance and speed
 3. Periodization for injury prevention and surveillance
 4. Psychological supercompensation
 5. Peaking for competition: factors facilitating peaking
4. Technical Preparation
 1. Technique, skill and style
 2. Technique training and its implication in various phases
 3. Methods of technique training
 4. Technical fault and their correction
5. Long term athletic development
 1. Stages of athletic development
 2. Generalized and specialized training
 3. Olympic cycle: classification of Olympic cycle plan
 4. Olympic cycle plan talent identification: methods, criteria, factors and phases of talent identification

Unit 2. Precision heart rate training

1. Heart rate monitoring and training
2. Training in heart rate zones
3. Precision heart rate training for specific sports
4. Multiactivity training with precision heart rate
5. Monitoring and training effects

Unit 3. Core Stabilization and Pilates

1. Core Stabilization
 1. Segmental stabilization concepts of spine
 2. Contribution of local and global muscle function in spinal stabilization
 3. Local muscle dysfunction
 4. Principle of clinical management of deep muscle function for segmental stabilization

5. Core stability exercises program
2. Pilates
 1. Induction, principles and techniques
 2. Types of Pilates
 3. Pilates for different sports

PART B

Unit 4. Sports Training

1. Training methods
 1. Interval and continuous training
 2. Circuit training
 3. Fartlek training
 4. Weight training: complex, contrast training
 5. Plyometric training: cross training
 6. Flexibility/mobility training
 7. Speed, agility and quickness training
2. Training load
 1. Training load, adaptation and recovery
 2. Fatigue and overtraining: diagnosis, monitor and prevention

Unit 5. Sports taping techniques

1. Taping techniques for joints, muscles and pathological conditions: prophylactic and therapeutic
2. Kinesiotaping techniques for muscles and joints

Unit 6. Neurotherapeutic manual techniques

1. Neurophysiology and neurodynamic
 1. Principles and concept
 2. Neurodynamic
 3. Clinical neurobiomechanics
2. Neural mobilization techniques
 1. Neural tension and mobilization for upper limb and lower limb
 2. Different school of thoughts for neural mobilization techniques

Course Articulation Matrix	P	P	P	P	P	P	P	P	P	P	P	P
	O1	O2	O3	O4	O5	O6	O7	O8	S1	S2	S3	S4
MPT. 504.1.	2	1	2	2	1	2	2	2	-	2	3	-
MPT. 504.2.	1	1	1	1	2	1	1	1	1	1	2	-
MPT. 504.3.	-	3	-	1	1	1	-	2	2	2	3	1
MPT. 504.4.	1	1	-	1	2	1	1	1	-	1	1	-
MPT. 504.5.	1	1	2	2	-	2	1	1	-	1	2	1
MPT. 504.6.	2	1	1	2	-	2	2	-	1	-	3	-

MR TIERS

MPT 505:PRACTICAL

UNIT 1. Orthopaedic/Sports assessment and evaluation

1. Assessment and examination
2. Biomechanical evaluation of running, throwing, jumping and swimming

Unit 2. Pre-participation Examination and Emergencies

1. On-field emergencies assessment and plan
2. Transportation of athletes

Unit 3. Sports medicine diagnosis

1. Biomechanical measurement of limbs and spine
2. Assessment through radiography, Tomography: CT scan, Ultrasonography and MRI
3. Electrodiagnosis through EMG, NCV, SD curve
4. Bone mineral densitometry, ultrasound densitometry and DEXA
5. Arthroscopy, Serology and biopsy, Myelography and radioactive scanning

Unit 4. Special test of Shoulder, Elbow, forearm, wrist and hand.

Unit 5. Special test of Hip, Knee, lower leg, ankle and foot.

Unit 6. Special test of chest, abdomen, spine and pelvis

PRACTICAL

Unit 1. Periodization

1. Macro, meso and micro cycles and Training session plan
2. Periodization for strength, endurance and speed
3. Methods of technique training
4. Olympic cycle plan talent identification: methods, criteria, factors and phases of talent identification

Unit 2. Precision heart rate training

1. Training in heart rate zones
2. Precision heart rate training for specific sports

Unit 3. Core Stabilization and Pilates

1. Core stability exercises program
2. Pilates types of exercise program

Unit 4. Sports Training

4.1. Interval and continuous training, Circuit training, Fartlek training, Weight training: complex, contrast training, Plyometric training: cross training, Flexibility/mobility training, Speed, agility and quickness training

Unit 5. Sports taping techniques

1. Mc Connell Taping, Mulligan taping techniques
2. Kinesiotaping techniques

Unit 6. Neurotherapeutic manual techniques

1. Neural mobilization techniques

2.

Course Articulation Matrix	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4
MPT. 504.1.	2	1	2	2	1	2	2	2	-	2	3	-
MPT. 504.2.	1	1	1	1	2	1	1	1	1	1	2	-
MPT. 504.3.	-	3	-	1	1	1	-	2	2	2	3	1
MPT. 504.4.	1	1	-	1	2	1	1	1	-	1	1	-
MPT. 504.5.	1	1	2	2	-	2	1	1	-	1	2	1
MPT. 504.6.	2	1	1	2	-	2	2	-	1	-	3	-

MPT 506: SEMINARS/ CASE PRESENTATION

Periods/week

L: 6 T: 0

Duration of Examination: NA

Credits

C:12

Max. Marks :100

Continuous Evaluation: 100

Pre-requisites: Nil

Course Type: Skill Development Course

Course Outcomes:

Skill Development Course

Course Outcomes: The students will be able to

MPT 506.1 To enhance applied communication abilities of the students

MPT 506.2 To enhance personal effectiveness by raising awareness about self

MPT 506.3 To enhance way of physical and verbal presentation and efficiently manage self in front of others.

MPT 506.4 To develop the right attitude towards work and life to increase efficiency, reduce stress and increase happiness quotient

Distribution of Continuous Assessment

Viva- I	50%
Viva- II	50%
Preliminary Viva	35%
File work/log book	15%

PO-CO Statement (MPT506)	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5
MPT506.1	1	-	-	1	-	-	3	1	-	-	1	-	-
MPT 506.2	1	2	1	1	2	1	2	3	2	1	1	2	1
MPT 506.3	-	-	1	-	-	1	1	-	1	1	-	-	1
MPT 506.4	-	2	2	1	2	2	2	-	1	2	1	2	2