MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES AND TECHNOLOGY
JAIPUR

Mahatma Gandhi Physiotherapy College

Syllabus

Master of Physiotherapy (MPT)

Neurosciences

Program Code: MPT(N)26

Duration: 2 Years

(MPT)

2026-2027

Recommended by the BOS in Physiotherapy at its meeting held on 8.04.2026 , the Faculty of Allied and Healthcare Professions at its meeting held on 28.7.2026 and approved by Academic Council at its meeting held on 03.08.2026.

Principal
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Notice

1. The university reserves the right to make changes in the syllabus /books/ guidelines, fee structure or any other information at any time without prior notice the decision of the university shall be binding on all.

2. The jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

3. This syllabus is aligned with the NCAHP Curriculum dated 24.04.2025 and Corrigenda issued on 27/01/2026,2/07/2026 and 20/07/2026. Any subsequent amendments, revisions or corrigenda issued by the NCAHP shall automatically apply to the Rules, Regulations and Syllabus of MGUMST, Jaipur, and implemented accordingly.

References:

- https://ncahp.abdm.gov.in/Curriculum/Physiotherapy.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Physiotherapy%20Corrig endum-1.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Corrigendum2PHYSIOT HERAPY.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Corrigendum3Physiother apy.pdf
- https://ncahp.abdm.gov.in/Resources/ImpLetters/LetterNEETDeferred02Mar2026.pdf

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Rules and Regulations of Master of Physiotherapy (MPT) in Neurosciences

MPT(N)26

1. TITLE OF THE PROGRAM:

Master of Physiotherapy (MPT) Neurosciences

2. DURATION OF THE PROGRAM:

Duration of the course: 2 Years.
Total minimum hours: 3240 hours.

3. MEDIUM OF INSTRUCTION:

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

4. ELIGIBILITY FOR ADMISSION:

4.1. Candidates must have passed Bachelor of Physiotherapy (BPT) on regular mode from recognised university.

4.2. He/she has to finish at the time of submission of application form, a certificate of physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.

5. ADMISSION PROCESS:

5.1. Admission to Masters of Physiotherapy courses shall be made on the basis of eligibility and an entrance test to be conducted for the purpose at the State/ University level. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.

a) Admission on the basis of entrance exams by the University.

b) Post Graduate entrance criteria required to be a compulsory registered member of National Commission for Allied and Healthcare Professions (NCAHP).

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

d) Candidate who fails to attend the Medical Examination/ physical fitness on the notified date(s) will forfeit the claim for admission.

5.2. A medical fitness certificate is mandatory to submit and it is to be endorsed by a Government medical officer.

5.3. Foreign students' admission process in Post-Graduation (PG):

i. Foreign national students intending to study PG program in India, shall have to take equivalence certificate of eligibility certificate from respective State allied and Healthcare council.

ii. Admission of foreign national students, merit list will be based on University Entrance Exam.

iii. Verification of Valid Visa and valid Visa duration of foreign national students, to be verified by respective institution & University before enrolling students for program

5.4. Admission process shall be conducted by State/Union Territory/University

5.5 **Maximum duration of the program:** Candidates should complete the Masters of Physiotherapy degree course within a period of **four years** from the date of joining in the course.**@**

6. RESERVATION POLICY:

Reservation policy for admission in under graduate programs shall be as per the State/Centre Government norms.

7. ENROLMENT &/ or REGISTRATION:

Every candidate who is admitted to Master of Physiotherapy (MPT) Neurosciences Degree Program in Mahatma Gandhi College of Physiotherapy shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST) after paying the prescribed eligibility and enrolment fees.

A candidate shall deposit the enrolment fee along with the tuition fee at the time of admission to the course. Any candidate who fails to submit the duly filled enrolment form to the college Principal, along with the original documents including the migration certificate required for enrolment, within the prescribed period shall be required to pay the applicable late fee. No student will be allowed to appear in the university examination without enrolment.@

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

8. INTRODUCTION:

8.1 Objectives/Aims of the Program:

The Master's program in Physiotherapy is designed to provide advanced education and specialized training in the field of physiotherapy. The program aims to produce highly competent practitioners capable of addressing the diverse and evolving healthcare needs of the population. This comprehensive program combines in-depth theoretical knowledge with extensive practical skills, focusing on evidence-based practice, clinical reasoning and research methodologies in various specialties such as musculoskeletal science, neuroscience, cardio-pulmonary science, sports science, paediatrics and neonatal science, obstetrics and gynaecological science, oncology, community physiotherapy and many more as the profession evolves.

8.2 Program Outcomes:

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

PO1 - Discipline-Specific Knowledge & Skills

PO2 - Independent Clinical Practice

PO3 - Communication

PO4 - Member of a multidisciplinary health team

PO5 - Ethics and accountability at all levels (clinical, professional, personal and social)

PO6 - Commitment to professional excellence

PO7 - Leadership and mentorship

PO8 - Social accountability and responsibility

PO9 - Lifelong learning

PO10 - Scientific attitude and scholarship (only at higher level-MPT and PhD)

On successful completion of M.P.T programme, the Physiotherapist will be able to practice in his / her specialty area with advanced knowledge and skills, take up physiotherapy teaching assignments independently for undergraduate teaching programme, as well as will be able to design and undertake research (using sound data processing techniques and statistical methods) independently in the field of physiotherapy.

8.3 Program Specific Outcomes:

At the completion of this course, the student should be -

1. Able to execute all routine physiotherapeutic procedures based on evidence-based practice.
2. Able to apply advanced assessment techniques to identify and treat various conditions needing physiotherapeutic procedures.
3. Able to develop individualized treatment plans and implement advanced therapeutic techniques independently based on evidence-based practice and clinical guidelines.
4. Able to provide adequate knowledge about the treatment procedures and its benefit to patients, families and other healthcare professionals.
5. Able to transfer knowledge and skills to students as well young professionals.
6. Able to design and undertake independent research studies.
7. Able to critically appraise and apply current research in clinical practice.
8. Able to apply multidisciplinary practice skills and be a prominent member of the team.
9. Able to practice and assess patients independently.
10. Able to develop and apply leadership skills necessary for roles in clinical settings, academia and healthcare administration.

8.4 Graduate Attributes:

1. Course work includes advanced knowledge and skills related to the respective branch of specialty.

2. Acquire in-depth knowledge of structure and function of the human body related to the respective branch of specialty.

3. Acquire the in-depth knowledge of movement dysfunction of the human body, because of principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.

4. Demonstrate skills in Physical and Functional diagnosis pertaining to patient under his/her care.

5. Demonstrate ability to critically appraise recent primary and secondary literature from journals and adopt diagnostic and therapeutic procedures based on it.

6. Perform independent research within the department and help the department and the team for treatment planning of the patient.

7. Engage in continuous professional development and lifelong learning to stay abreast with the advancement and new technology in the field. The professional should opt for continuous professional education credits offered by national and international institutes recognized by the NCAHP.

8. Demonstrate ability to make clinical decisions (based on evaluation) regarding Physiotherapy strategy techniques and select appropriate outcome measures based on the comprehensive knowledge of specialty.

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

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

11. Planning and implementation of treatment programme adequately and appropriately for all clinical conditions common as well as rare related to respective specialty in acute and chronic stage, Various situation and places related to the specialty

12. Demonstrate proficiency in creating awareness using newer technology, at various levels in community for Healthcare and professional awareness.

13. Demonstrate leadership, managerial, administrative and communication skills.

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

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

8.4 Skills Based Outcomes and Monitorable Indications for Masters of Physiotherapy

The Intended Course Outcome with Competency Levels, Learning Methods and Assessment methods are depicted in Table below:

Table 1: Intended Course Outcome with Competency Levels, Learning Methods and Assessment Methods

Course	**Intended Learning Outcome**	**Teaching Learning Methods**	**Assessment Methods**
Competency level	K – Knows [Describe, Define] KH – Knows How [Explain, Analyse, Identify, Recognise] S- Shows [Demonstrate] SH – Shows How [Demonstrate] P- Performs Independently [Perform]	Lecture Tutorial Demonstration using models including digital Flipped class Dissection panel discussion field Visit case study Debate Practical [Lab Work, Video Demonstration, Role Play, Hands On, Virtual Reality Simulation, Case Discussion]	MCQs Assignments Short Essays Long essay Spotters Viva Voice Presentations Debate

Table 2: Intended Program Outcomes and Broader Competencies for Physiotherapists in diverse roles

Role/Domain	Intended Program Outcomes	Broader Competencies
I. Clinical / Physiotherapy Practitioner	Demonstrate competencies to provide quality care to individuals and populations to optimise their movement, function, and quality of life. Promote health and implement strategies informed by best available research evidence to prevent and minimise impairments, activity limitations and participation restrictions caused due to various disorders.	1. Plan and implement culture-specific Physiotherapy assessment to identify impairments, activity limitations, and participatory restrictions. 2. Examine, assess, evaluate and treat various disorders, diseases and trauma conditions for physio- therapeutic interventions. 3. Prescribe physiotherapeutic modalities, therapeutic exercises, assistive devices, aid, appliances, support systems and home modifications. 4. Prescribe and comprehend various diagnostic imaging, electro- physiological, hematological and biochemistry investigations for proper diagnosis and physiotherapeutic treatment. 5. Design, implement, evaluate, and monitor patient-centered physio- therapy care based on the available evidence. 6. Involves patients, care givers, and related healthcare providers in holistic clinical decision making. 7. Evaluate the Physiotherapy intervention and modify as required. 8. Considers local and cultural aspects in clinical decision making and plan of care.
II. Ethical and professional practitioner	Demonstrate the commitment to provide ethical care through high standards of professional practice.	1. Incorporates legal and ethical standards into Physiotherapy practice. 2. Demonstrate the knowledge of national, international, and professional association's policies and ethical standards. 3. Comply with legal standards and regulatory requirements as prescribed by relevant organisations.
III. Communicator	Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships	1. Communicate effectively with colleagues, patients, Healthcare providers and other stakeholders. 2. Demonstrate ability to document Physiotherapy assessment, plan of care, protocol modification, and evaluation as per the prescribed standards.
IV. Evidence-based practitioner and lifelong learner	Demonstrate competencies to integrate best available research evidence into clinical decision making and practice.	1. Demonstrates competencies in acquiring, appraising, and applying research evidence. 2. Identifies the need for continuing professional development.

	Exhibits commitment towards continuous learning and scholarly activities.	
V. Inter-professional teamwork	Demonstrate abilities to work effectively with Healthcare team in providing patient centred care	1. Contribute to effective team-work through comprehensive, collaborative, consultative, culturally responsive, and patient centred models of practice. 2. Demonstrate competencies for appropriate referral to other medical and Healthcare professionals
VI. Leader and Manager	Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services.	
VII. Quality assurance	Demonstrate competencies in quality assurance relevant to physiotherapy practice	1. Demonstrate knowledge in quality policies, procedures, process, and standards.

9. ATTENDANCE:

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

9.1. Methods of training:

The training of the MPT student shall be conducted on a full-time basis, with progressively increasing responsibilities in the management and treatment of patients assigned to their care. Acquisition of practical competencies being the keystone of post graduate education, the training should be skills oriented. Learning in post graduate programmes should be essentially self-directed and primarily emanating from clinical and academic work.

The formal sessions are merely meant to supplement this core effort. Participation of all the students in all facets of the educational process is essential and each candidate should take part in seminars, group discussions, clinical rounds, case presentations, clinics, journal review meetings

and continuous professional education (CPE). Training should also include involvement in clinical research studies and every Masters' candidate should be engaged in the teaching and training programs of undergraduate Physiotherapy students.

9.2. Formal teaching sessions [minimum]:

Master's candidates should be subjected to at least 4-hrs of formal teaching per week per subject. The departments may select a mix of the following sessions:

i. Journal club once a week Seminar;
ii. Lecture twice a week
iii. Case discussions twice a week
iv. Interdepartmental case or seminar once a week

9.3. Log Book:

9.3.1. Every candidate shall maintain a log book and record his/her participation in the training programs conducted by the department such as journal reviews, seminars etc. Candidates must also record research presentations and details of clinical research studies, if any.

9.3.2. The log book shall be scrutinized and certified by the Head of the Department (HoD) and Head of the Institution and presented in the university examination.

9.4. Periodic tests

9.4.1. The College may conduct periodic tests based on the pattern of university examination. Such tests may include written theory papers, practical, viva voce and clinical assessment. Records and marks obtained in such tests will be maintained by the HoD and shall be produced as and when called for.

9.4.2. The assessment will be a combination of formative and summative assessments:

i. Theory, inter-departmental meeting

ii. Practical- clinical rounds and bed side evaluation and application.

iii. Teaching Activities – UG Teaching

iv. Learning Activities: Self Learning, use of computers and library

v. Participation in departmental activities;

a. Journal review meetings

b. Seminars

c. Clinical presentation

d. Special clinics

e. Inter departmental meetings

f. Community work, camps / field visits

g. Clinical rounds

h. Dissertation work

vi. Participation in conferences/ presentation of paper -Minimum 2 in two years

vii. Any other – Specify (eg: CPE)

viii. Rotation and posting in other departments for a maximum of 6 months the candidate must spend 18 months in the department of specialty concerned

9.5. Graded responsibility in the care of patients and operative work (Structured training schedule of clinical and elective subjects only)

Category	I year MPT	II year MPT
O	20 Cases	20 Cases

A	20 Cases	30 Cases
PA	100 Cases	75 Cases
PI	25 Cases	50 Cases

Key: O – Observes

A – Assists a senior Physiotherapist

PA – Performs procedure under the direct supervision of a senior specialist

PI – Performs Independently

10. MINIMUM INSTRUCTION/ TEACHING DAYS:

Each year shall consist of not less than 240 working days including examinations.

11. PROGRAMME STRUCTURE (YEAR I & II):

Table 3: Year Wise Program Structure

Year	Core Course Component	Practical	Total No. of Courses/Papers
Year 1	4	4	8
Year 2	3	5	8
Total	**7**	**9**	**16**

MPT 1st Year

S. No	Subject Code	Subject Name	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
1	MPT - 101	Laws, Ethics, Administration Educational Methodology (LEM)	90		90	6		6

2	MPT - 102	Research Methodology and Biostatistics, EBP (RMB)	90		90	6		6
3	MPT - 103	Biomechanics & Therapeutics (BCT)	90		90	6		6
4	MPT (N) - 104	Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)	120	120	240	8	4	12
5	MPT - 105	Skills Acquisition and Refinement (SAR-I)		240	240		8	8
6	MPT - 106	Clinical Training (CT-I)		690	690		23	23
7	MPT - 107	Dissertation (DSS-I)		90	90		3	3
Grand Total			**390**	**1140**	**1530**	**26**	**38**	**64**

MPT 2nd Year

S. No	Subject Code	Subject Name	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
1	MPT - 201	Exercise Physiology (EP)	90		90	6		6
2	MPT (N) - 202	Neurological Physiotherapy (NPT)	120	120	240	8	4	12
3	MPT (N) - 203	Recent advances and Evidence Based practice in Neuro-Physiotherapy (NRAEB)	120	120	240	8	4	12
4	MPT - 204	Dissertation (DSS-II)		660	660		22	22
5	MPT - 205	Skills Acquisition and Refinement (SAR-II)		240	240		8	8
6	MPT - 206	Clinical Training (CT-II)		600	600		20	20
Grand Total			**330**	**1740**	**2070**	**22**	**58**	**80**

12. CONDUCT OF CONTINUOUS ASSESSMENT/ INTERNAL ASSESSMENT

12.1. ASSESSMENT:

It is essential to monitor the learning progress of each Master's candidate through continuous appraisal and regular assessments. It not only helps teachers to evaluate the students, but also students to evaluate themselves. The monitoring is done by the staff of the department, based on

participation of students in various teaching / learning activities. The assessment may be structured using checklists that assess various aspects of competencies.

12.1.1. FORMATIVE ASSESSMENT: Formative assessment should be continuous and should assess clinical knowledge, patient care, procedural and academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system. Quarterly assessment during the MPT training shall be done by the faculty members of the department based on:

i. Journal based / recent advances learning

ii. Patient based /Laboratory or Skill based learning

iii. Self-directed learning and teaching

iv. Departmental and interdepartmental learning activity

v. External and Outreach Activities. The assessment may be structured using checklists that assess various aspects of competencies.

12.1.2. SUMMATIVE ASSESSMENT

i. Theory Examination: Clinical / Practical and viva voce Examination: All examiners shall be recognized post graduate teachers. At least 50 % of total examiners shall be externals. (From Other universities)

ii. Dissertation: Thesis shall be submitted at least three months before the Theory and Clinical / Practical examination. The thesis shall be examined by a panel of three examiners; one internal and two external examiners, who shall also be the examiners of Clinical examination.

iii. Practical examination: Practical examination shall be conducted at the end of second year by a panel of 3 examiners out of which two should be from other institutions and one of these two must be from outside the State. Practical examination should be conducted in two days:

a. On day one- clinical examination (OSCE and OSPE), should be conducted.

b. On the second day dissertation should be examined along with teaching skills and viva voce. Students shall make a 15-minute presentation of the dissertation followed by a 10-minute question and answer session by the examiners.

iv. Marks: Marks to be awarded separately by each examiner and an average shall be taken as the final marks awarded to the student in both practical as well as dissertation.

13. DISSERTATION/ INTERNSHIP/ PROJECT/ CLINICAL POSTINGS:

13.1 Each candidate will have to carry out a dissertation on the Specialty related subject of MPT. Ethical approval certificate from the Registered **Institutional Ethical committee** and Clinical Trial Registration is mandatory for interventional Dissertation study topics. The dissertation to be guided by Guide of the specialty of faculty of physiotherapy of the department under whom the student is pursuing MPT. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean/Principals office with the result. The dean/ Principal's office will send the dissertation to the library for record.

13.2 Every candidate pursuing an MPT degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of dissertation.

13.3 The dissertation is aimed to train a graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis search and review of literature, getting acquainted with recent advances, designing a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

13.4 Submission of topic and initial presentation shall be done 2 months after joining the session.

13.5 Every candidate shall prepare a synopsis in the prescribed Performa, a synopsis containing particulars of proposed dissertation work and submit 6 months after joining the university.

13.6 The synopsis shall be submitted through the proper channel i.e. to the Principal of the College & then to the Departmental Research Committee (DRC). Before submitting the synopsis to the University, it shall be ensured by the Principal of the College that it has been cleared by

the Institutional Ethical Committee, MGUMST. The university will register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the university.

13.7 Guide will be only a facilitator, advisor of the concept and responsible in correctly directing the candidate in the methodology and not responsible for the outcome and results.

13.8 The written text of dissertation shall not be less than 100 pages and shall not exceed 120 pages including references, tables, questionnaires, and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly.

13.9 Spiral binding should be avoided for the thesis. The Guide and Principal of the College shall certify the dissertation.

13.10 Five copies of the dissertation thus prepared shall be signed by the candidate and the guide and then four copies must be submitted to the principal office, six months before the filling of the form of End of Year Evaluation Examination. Late fees will be applied to candidates in case of late submission of thesis as per notified by the Principal Office. Candidates who will not submit their thesis on time will not be eligible to fill the university end of semester evaluation form.

13.11 Principal Office will send the dissertation to the Registrar of University for Evaluation.

13.12 The dissertation shall be examined by a minimum of three examiners one Internal and two External for 5 thesis.

13.13 Evaluation of the dissertation would be done jointly by the external and internal examiners, who will be appointed by the President of University.

13.14 Criteria for recognition of MPT teacher/Guide:

13.14.1. To be recognized as a guide, one must have a minimum of 5 years' of teaching experience after post-graduation as a lecturer/assistant professor.

13.14.2. Guide should be of the same elective/ specialty stream as of student.

13.14.3. **Change of Guide:** In the event of the registered guide being unavailable for any reason, the guide for the concerned students may be changed with prior permission from the university as per the following guidelines. Students cannot be left without a guide for more than 3 months in total during their post-graduation study (i.e. in the event of resignation of guide, the college should appoint a guide within 3 months)

13.14.4. For student benefit, services of visiting faculty can be utilized, but these faculty members will not be counted in the PG teacher.

14. SCHEME OF EXAMINATION:

14.1 First Year M. P. T. Examination [Annual Pattern]

Table 4: First Year M.P.T. Examination Scheme

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	MPT - 101 Laws, Ethics, Administration Educational methodology (LEM)			100			100	90		90	6		6
2	MPT - 102 Research methodology and biostatistics, EBP (RMB)			100			100	90		90	6		6
3	MPT - 103 Biomechanics & Therapeutics (BCT)			100			100	90		90	6		6

4	MPT (N) -104 Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)			100			100	120	120	240	8	4	12
5	MPT - 105 Skills acquisition and refinement (SAR-I)	(Locomotor Disability, BLS and ALS, and Disaster Management.)					80		240	240		8	8
6	MPT – 106 Clinical Training (CT-I)						250		690	690		23	23
7	MPT-107 Dissertation (DSS-I)						30		90	90		3	3
Theory Total							**760**	**390**	**1140**	**1530**	**26**	**38**	**64**

N.B. – i. The NUES (Non-University Examination Subjects) examinations are to be conducted at the college/institution level as suggested by the Board of Studies of the concerned university. Earned credits may be calculated based on grades secured in college/institutional examinations. Passing criteria remain a minimum of 50% for university and non-university exam subjects.

ii. The Board of Studies of the concerned university may develop structured rubrics for assessment of student performance in clinical setups.

14.2 Second Year M. P. T. Examination [Annual Pattern]

Table 5: Second Year M.P.T. Examination Scheme

S. No	Subject	Internal Assessment Marks		University Examination Marks			Total Marks	Theory hours	Practical hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	MPT - 201 Exercise Physiology (EP)			100			100	90		90	6	0	6
2	MPT (MS) - 202 Neurological Physiotherapy (NPT)			100			100	120	120	240	8	4	12
3	MPT (MS) – 203 Recent advances and Evidence Based Practice in Neuro-Physiot			100			100	120	120	240	8	4	12

	herapy (NRAEB)												
4	MPT-204 Dissertation (DSS-II)						200		660	660			22
5	MPT-205 Skills acquisition and refinement (SAR-II)						80		240	240		8	8
		(Teaching Assignment, Seminars, journal club & Case Studies etc.)											
6	MPT – 206 Clinical Training (CT – II)						200		600	600		20	20
Theory Total							**780**	**330**	**1740**	**2070**	**22**	**58**	**80**
Practical Marks													
7	Major Elective					150	150						
8	Two Minor Elective					150	150						
9	OSPE/OSCE					100	100						
10	Dissertation					50	50						
Practical Total						450	450						
Grand Total							**750**	**330**	**1740**	**2070**	**22**	**58**	**80**

14.3 Curriculum Outline and detailed Curriculum

14.3.1. Common subjects for all PG

1. Laws, Ethics, Administration and Educational methodology
2. Research methodology, biostatistics and EBP
3. Biomechanics and Therapeutics
4. **Locomotor Disability Assessment:** To be taught in the first year under MPT - 105 Skills Acquisition and Refinement (SAR-I)
5. **BLS and ALS:** To be taught in the first year under MPT - 105 Skills Acquisition and Refinement (SAR-I)
6. **Disaster Management:** To be taught in the first year under MPT - 105 Skills Acquisition and Refinement (SAR-I)
7. Exercise physiology
8. Dissertation
9. Practical / clinical examination

14.3.2. General design for specialties

1. Clinical and functional diagnosis in specialty
2. Concepts of specialty

14.3.3. Recent advances in the Neurosciences

15. CONDUCT OF UNIVERSITY EXAMINATION:

15.1 Appointment of Examiners and Paper Setter (Qualification of Paper Setters and Examiners):

MPT possessing: Assistant Professor and above with at least 3 years of working experience (Academic).[@]

15.2 Eligibility to appear for the examination:

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

A. For internal assessment:

i. A candidate shall be considered to have passed the internal assessment examination if he/she has obtained 50% and above marks in theory and viva/practical collectively.

ii. A candidate shall be considered to be eligible for university examination if he/she has passed the intemal assessment examination.

iii. The NUES (Non-University Examination Subjects) examinations are to be conducted at the college/institution level as suggested by the Board of Studies of the concerned university. Earned credits may be calculated based on grades secured in college institutional examinations. Passing criteria remain a minimum of 50% for university and non-university exam subjects.

B. For university examination:

i. A candidate failing in MPT lst year in any number of subject(s) is permitted to MPT 2nd year and allowed to appear for supplementary exams in the 2nd year.

ii. A candidate shall be declared to have passed the MPT examination if he/she obtains 50% and above marks in theory and practical separately.

15.3 Theory Examinations:

Theory paper : Duration: 3 Hours

Total Marks: 100

Table 6: Type of Theory question paper and Question type for M.P.T and Marking scheme

SI. No.	No. of Questions	Question Type	Marks
1	1	Long Answer	1 x 20 = 20
2	1	Long Answer	1 x 20 = 20
3	1	Long Answer	1 x 20 = 20
4	1	Long Answer	1 x 20 = 20
5	1	Long Answer	1 x 20 = 20
Total			**100**

15.4 Practical Examination and Viva Voce

a. shall be conducted at the end of second year by a panel of 3 examiners out of which two should be from other institutions and one of these two must be from outside the State**.** Practical examination should be conducted in two days:

   i. On day one- clinical examination (OSCE and OSPE), should be conducted.

   ii. On the second day dissertation should be examined along with teaching skills and viva voce. Students shall make a 15-minute presentation of the dissertation followed by a 10- minute question and answer session by the examiners.

b. Marks to be awarded separately by each examiner and an average shall be taken as the final marks awarded to the student in both practical as well as dissertation.

   i. University Practical Exam: Total marks = 450

Table 7: Practical Exam Scheme and marks distribution for M.P.T

SI. No.	Exams	Marks
1	ONE Clinical case presentation-Major Elective	1 x 150=150
2	TWO Clinical Presentation -Minor Elective	2 x 75 = 150
3	OSPE/OSCE	100
4	Dissertation Presentation	50
Total		**450**

15.5 Results:

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

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

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

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

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

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

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

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

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

Table 8: Equivalence Table for Marks, Grades and Grade Points

Letter Grade	Grade Point	Range of Marks*
O (Outstanding)	10	85 % and above
A+ (Excellent)	9	80 - 84.99 %
A (Very Good)	8	75 - 79.99 %
B+ (Good)	7	70 - 74.99 %
B (Average)	6	60 - 69.99 %
C (Average)	5	55 - 59.99 %
P (Pass)	4	50 - 54.90 %
F (Fail)	0	< 50 %
Absent	0	0

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

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student's overall years. The CGPA is the ratio of total credit points secured by a student in

various courses in all year and the sum of the total credits of all courses in all the year. It is expressed up to two decimal places

GRADES QUALIFYING FOR PASS:

Theory & Practical Examination:

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

Table 9: Credit Weightage Distribution %

Item	Credit %
Summative Assessment	100%

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

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

$$AGPA\ (Si) = \sum(Ci \times Gi) / \sum Ci$$

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

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

Table 10: Illustration for Computation of (AGPA) Annual Grade Point Average

Course	Credit (Ci)	Grade Letter	Grade point (Gi)	Credit Point = Credit (Ci) x Grade point (Gi)
Course 1	3	A	8	24

Course 2	4	B+	7	28
Course 3	3	B	6	18
Course 4	3	O	10	30
Course 5	3	C	5	15
Course 6	4	B	6	24
Total	**20**			**139**
AGPA (Si) = Credit points / Total credit		**139/20 = 6.95**		

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

$$CGPA = \sum(Ci \times Si) / \sum Ci$$

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

iv. The CGPA shall be calculated after deriving year wise AGPA and rounded off to 2 decimal points and reported in the transcripts.

Table 11: Illustration for Computation of Cumulative Grade Point Average (CGPA)

Year	Total Credit	AGPA	AGPA x Credit	Credit Point
Year 1	55	6.9	55 x 6.9	379.5
Year 2	56	7.8	56 x 7.8	436.8
Total	**111**			**816.4**
CGPA (Si) = Credit points / Total credit		**816.4/111 = 7.35**		

15.6 Supplementary/Remanded Examination:

As per the regulations by the University Policy of Mahatma Gandhi University of Medical Sciences and Technology (MGUMST) Jaipur.

15.7 Revaluation/Scrutiny:

As per the regulations prescribed for review of answer papers by the University Policy of Mahatma Gandhi University of Medical Sciences and Technology (MGUMST) Jaipur.

15.8 Promotion to the Next Year:

A candidate shall be declared to have passed the MPT examination if he/she obtains 50% and above marks in theory and practical separately.

A candidate failing in MPT lst year in any number of subject(s) is permitted to MPT 2nd year and allowed to appear for supplementary exams in the 2nd year.

16. AWARD OF DEGREE:

The degree shall be awarded by the University only after receipt of Course completion certificate and NO dues from the Head of Institution. (Dean/Principal of the college).

A successful candidate

i. Who secures 75% and above in the aggregate marks shall be declared to have secured 'FIRST CLASS WITH DISTINCTION' provided he/she passes the whole examination in the FIRST ATTEMPT;
ii. Who secures above 60% and less than 75% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'FIRST CLASS, provide he/she passes the whole examination in the FIRST ATTEMPT';
iii. Who secures above 50% and less than 60% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'SECOND CLASS'; and
iv. All other successful candidates shall be declared to have PASSED the examinations

17. AUTHORITY TO ISSUE TRANSCRIPT:

The Controller of Examination of the University shall be the authority for issuing a transcript after receiving the described fee from the candidate.

18. LOGBOOKS AND CLINICAL RECORDS:

1. Maintenance: A logbook must be maintained by the candidate, detailing academic competency, clinical competency, skills obtained, and related activities.

2. Clinical Competencies: The logbook should include details of clinical competencies with pre-specified number of minimum records for:

    i. Patient Case logs/ records

    ii. Procedures

    iii. Presentations

3. Program Structure: The logbook should outline the program's content, structure, and timetable.

19. ANY SPECIFIC POINT/ RULE/ REGULATION RELATED TO COLLEGE/ INSTITUTE:

20. COURSE WISE SYLLABUS WITH RECOMMENDED TEXT BOOKS:

1st Year M.P.T Syllabus

Course Name	Course Code	Year	Course Description	Credit	Total Hours

Laws, Ethics & Administration and Educational Methodology: (LEM)	MPT - 101	1	Theory	6	90

A. COURSE OUTCOMES (CO)

Course Outcome Statements	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Explain the principles of bioethics (autonomy, beneficence, non-maleficence, justice), landmark ethical codes (Helsinki, Nuremberg), and ICMR guidelines governing responsible conduct of research. **(K)**	3	1	-	-	3	2	-	2	1	3
CO2: Apply ethical and legal frameworks (NCAHP Act, Consumer Protection Act, RPwD Act, informed consent process, IEC procedures) to clinical, research, and academic scenarios in physiotherapy practice, including vulnerable populations and conflict-of-interest situations. **(KH)**	3	3	2	2	3	2	-	3	-	3
CO3: Describe management processes (planning, organizing, staffing, finance, marketing, controlling, directing) and quality assurance systems (TQM, medical audit) applicable to hospital and physiotherapy service unit administration. **(K)**	3	2	1	2	1	2	2	-	-	-
CO4: Demonstrate effective communication strategies and plan the organizational setup of a physiotherapy service unit within a hospital system, integrating entrepreneurship opportunities in physiotherapy practice. **(KH)**	2	2	3	3	1	2	3	2	-	-
CO5: Formulate intended learning outcomes and lesson/unit plans using	3	-	3	1	-	3	3	1	3	2

educational frameworks (Bloom's Taxonomy, Miller's Pyramid, Tyler's principles, Dreyfus model, adult learning theories) and select appropriate teaching methods and aids for classroom and clinical settings. **(KH)**										

B. COURSE CONTENTS:

Section - A: Ethics and Law

LEM 1.1. Principles of ethics History and evolution of ethics - Helsinki declaration; Nuremberg Code; Principles of ethics and its importance - Autonomy, Beneficence, Nonmaleficence, Justice

LEM 1.2. Professionalism

LEM 1.3. Ethics in professional practice Principles of practice in respective professions. Privacy, confidentiality, shared decision making, informed consent, equality and equity, justice

LEM 1.4. ICMR Guidelines General principles, Responsible conduct of research, Risk benefit assessment

LEM 1.5. Informed Consent Process Components of informed consent document, Procedure in obtaining informed consent, Special situations, waivers, and proxy consent

LEM 1.6. Roles and Responsibilities of IEC Ethical Review process, Classification of projects for review, Roles and responsibilities of members, Communications with investigators and authorities

LEM 1.7. Ethics in Special and Vulnerable Populations Types of Vulnerability and vulnerable population, Challenges for research in vulnerable population, Guidelines for research in special and vulnerable population

LEM 1.8. Conflict of Interest Definition and Types of Conflict of Interest, Identifying, mitigating and managing Conflict of Interest, Conflicts of interest in international collaborations

LEM 1.9. Publication Ethics Importance of publishing, Authorship guidelines according to ICMJE, Plagiarism

LEM 1.10. Laws governing Physiotherapy practice: NCAHP Act, Consumer Protection Act, Rights of persons with disability act Ethical issues in practice of Physiotherapy-Clinical, Research and Academics

Section - B: Management and administration in Physiotherapy

LEM 2.1. Principles and applications of Management and Administration to Physio Therapy practice:

LEM 2.2. Management PROCESS: planning, organizing, staffing, finance, marketing, controlling, directing.

LEM 2.3. Quality assurance: Total Quality Management: basis of quality management, quality assurance program in hospitals, medical audit and international quality system.

LEM 2.4. COMMUNICATION: Process of Communication Barriers to Communication Types of Communication Written vs. Oral Communication Elements of good communication

LEM 2.5. Hospital as an organization: functions and types of hospitals MANAGEMENT IN HOSPITAL Setting of a physiotherapy service unit

Section - C: Management of Teaching Institution and Educational Methodology In Physiotherapy

LEM 3.1. Education: definition, aims and objectives of education, Agencies of education, Formal and informal education, brief introduction to the philosophies of education, taxonomy of educational objectives, essentials of Physiotherapy education, NEP

LEM 3.2. Basics of Adult Learning Theories including Learning Styles and Motivation

LEM 3.3. Concept of teaching – learning - nature of learning, type and stages of learning, factors affecting learning, laws of learning, learning style teaching learning process, role of teacher in teaching learning process, Adult learning

LEM 3.4. Teaching skills, Teaching Methods in Classroom Setting, clinical teaching methods, planning of teaching: lesson planning and unit planning Teaching aids and educational technology

LEM 3.5. Formulating Intended Learning Outcomes Including Tyler’s principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition

LEM 3.6. Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities

Recommended books for LEM:

1. Beauchamp and Childress, Principles of Biomedical Ethics, Fourth Edition. Oxford.
2. Patricia A Marshall. Ethical challenges in study design and informed consent for health research in resource poor settings. World Health Organization. 2007.
3. National Ethical guidelines for Biomedical and Health Research involving human participants. Indian Council of Medical Research. 2017.
4. ABC of Learning and Teaching in Medicine. Editor(s): Peter Cantillon, Diana Wood, Sarah Yardley. Ed: 3
5. Understanding Medical Education: Evidence, Theory, and Practice, Editor(s): Tim Swanwick Kirsty Forrest Bridget C. O'Brien. Ed 3
6. Principles of Medical Education. Editor(s): Tejinder Singh, Piyush Gupta, Daljit Singh. Jaypee Brothers. 2012. New Delhi.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Research methodology and Biostatistics and Evidence based practice (RMB)	MPT - 102	1	Theory	6	90

A. COURSE OUTCOMES (CO)

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Describe research paradigms, study designs (observational, experimental, qualitative), sampling strategies, and measurement properties (reliability, validity, responsiveness, MCID) relevant to rehabilitation research. **(K)**	3	1	-	-	1	2	-	-	2	3
CO2: Formulate an answerable research question and design a methodologically sound study protocol, including appropriate design selection, sampling plan, minimum sample size calculation, and outcome measure selection. **(KH)**	3	2	1	-	2	2	-	1	2	3
CO3: Select, apply, and interpret appropriate descriptive and inferential statistical procedures (parametric/non-parametric tests, correlation, regression, chi-square, power analysis, epidemiological measures) using statistical software. **(SH)**	3	1	-	-	1	2	-	-	2	3
CO4: Critically appraise published research for methodological quality, bias (Type I/II), and clinical applicability, and translate evidence into practice using clinical practice guidelines, pathways, and prediction rules. **(P)**	3	3	1	2	2	3	1	2	3	3

CO5: Prepare and communicate scientific documents (research protocol, thesis structure, abstract, research paper) using standard style manuals (APA/MLA) and present research findings through oral and poster formats. **(SH)**	2	-	3	2	2	2	1	1	2	3

B. COURSE CONTENTS:
Section - A: Research Methodology

RMB 1.1. Introduction to research

RMB 1.2. Types of research

RMB 1.3. Defining a research question

RMB 1.4. Qualitative study designs

RMB 1.5. Quantitative study

RMB 1.6. Type I and type II bias

RMB 1.7. Study design: types

RMB 1.8. Case study, Case series, longitudinal cohort, Pre post design, Time series design, repeated measures design, Randomized control design.

RMB 1.9. Sampling design, calculating minimum sample size based on design

RMB 1.10. Measurement: Properties of measurement: reliability, validity, responsiveness, MCID.

RMB 1.11. Outcome measures: Use of outcome measures in rehabilitation research

RMB 1.12. Research Methods: Designing methodology, Reporting results, Type I and Type II bias.

RMB 1.13. Communicating research.

RMB 1.14. Evaluating published research: looking at the evidence

RMB 1.15. Introduction to evidence-based practice, evaluating evidence,

RMB 1.16. Asking clinical questions

RMB 1.17. Translating of evidence into practice: strategies

RMB 1.18. Use of clinical practice guidelines, clinical pathways, prediction rules to inform practice.

Section - B: Biostatistics

RMB 2.1. Descriptive Statistics and measurement variability

RMB 2.2. Inferential Statistics

RMB 2.3. Comparison of group means: T-test

RMB 2.4. Analysis of variance

RMB 2.5. Multiple comparison tests

RMB 2.6. Parametric and Non parametric tests

RMB 2.7. Correlations

RMB 2.8. Regression

RMB 2.9. Analysis of frequencies: Chi square

RMB 2.10. Statistical measure of validity and reliability

RMB 2.11. Factorial Design analysis

RMB 2.12. Power analysis – Determining sample size, Epidemiological Measures – Rate, Ratio, Proportion, Incidence and prevalence, Relative risk, Risk ratio, Odds ratio

RMB 2.13. Application of various statistical software.

Section - C: Scientific Writing

RMB 3.1. Definition and kinds of scientific documents – Research paper, Review paper, Book, Reviews, Thesis, Conference and project reports (for the scientific community and for funding agencies).

RMB 3.2. Publication – Role of author, Guide, Co-authors.

RMB 3.3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research

RMB 3.4. Significance of Report writing; Different steps in Report writing; Mechanics and precautions of writing research reports Oral and poster presentation of research papers in conferences/symposia; Preparation of abstracts.

RMB 3.5. Structure of Thesis and Content – Preparing Abstracts

Recommended books for RMB

1. Bailey, N.T.J. -Statistical methods in Biology. The English universities press, London
2. Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
3. Colton - Statistics in medicine, Little Brown Company, Boston
4. Gupta, S.P -Statistical methods. Sultan Chand and Sons Publishers , New Delhi.
5. Goulden C.H.- Methods of Statistical Analysis. Asia Publishing House , New Delhi.
6. Mohsin S.M.- Research Methods in Behavioral Sciences: Orient Publications. New Delhi.
7. Mahajan - Methods in Biostatistics, Jay Pee Brothers.Medical Publishers (P) Ltd. New Delhi.
8. Hicks- Research for Physiotherapists, Churchill Livingstone, London.
9. Meenakshi. - First Course in Methodology of Research. Kalia Prakashan, Patiala.
10. Kumar , R.- Research Methodology. Pearson Education , Australia.
11. Snedecor,G.W -Statistical Methods, Allied Pacific Pvt. Ltd., London
12. Singh, I.- Elementary Statistics for Medical Workers. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi.
13. Rehabilitation Research: Principles and Applications by Elizabeth Domholdt (Elsevier Science Health Science Div, 2004).

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Biomechanics & Therapeutics (BCT)	MPT - 103	1	Theory	6	90

A. COURSE OUTCOMES (CO)

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Analyze normal and pathological human movement, regional joint biomechanics (UE, LE, spine), and gait using appropriate kinetic and kinematic tools and analytical techniques. **(SH)**	3	2	1	-	-	1	-	1	2	3
CO2: Prescribe and apply advanced therapeutic exercise techniques dynamic, plyometric, isokinetic, kinetic-chain, balance/coordination, PNF, and hydrotherapy grounded in tissue mechanics and functional assessment. **(P)**	3	3	2	1	2	2	1	1	2	2
CO3: Integrate contemporary manual therapy and clinical reasoning frameworks (Maitland, Kaltenborn, Cyriax, Mulligan, McKenzie) to formulate differential clinical diagnoses. **(P)**	3	3	2	2	2	2	1	-	3	2
CO4: Interpret electrodiagnostic procedures SD curve, EMG, nerve conduction studies, and evoked potentials to differentiate and localize neuromuscular pathology. **(SH)**	3	2	2	3	2	2	-	-	2	3
CO5: Select, justify, and apply electrotherapeutic and thermal modalities for tissue healing, pain, wound care, and integumentary conditions based on biophysical	3	3	1	1	3	2	-	1	2	2

principles, indications, and contraindications. **(P)**										

B. COURSE CONTENTS:

Section - A: Concepts of Biomechanics:

BCT 1.1. Introduction to Kinesiology and Biomechanics. Biomechanics of Tissues and structures of the musculoskeletal system

BCT 1.2. Principle of Biomechanics

BCT 1.3. Nature and importance of Biomechanics in Physiotherapy.

BCT 1.4. Methods of kinetics and kinematics investigation

BCT 1.5. Introduction to biomechanical analysis of human motion.

BCT 1.6. Analytical tools and techniques –

1. Isokinetic Dynamometer,
2. Kinesiological EMG,
3. Electronic Goniometer,
4. Force Platform,
5. Videography.

BCT 1.7. Upper Extremity: Shoulder and Shoulder girdle, Elbow joint, Wrist joint and Hand.

BCT 1.8. Lower Extremity: Pelvic Girdle, Hip joint, Knee joint, Ankle & Foot

BCT 1.9. Spine

BCT 1.10. Gait

BCT 1.11. Gait Analysis: Kinetic & Kinematic Analysis.

BCT 1.12. Pathological Gait: Kinetic & Kinematic Analysis

BCT 1.13. Ergonomic approach to lifting and handling, workspace and environment. Patient positioning, body mechanics and Transfer techniques

Section - B: Physiotherapy techniques

BCT 2.1. Principle of therapeutic exercises

BCT 2.2. Definition, details of effects and uses of following exercises.

BCT 2.3. Dynamic Exercises

BCT 2.4. Plyometric Exercises

BCT 2.5. Isokinetic Exercises

BCT 2.6. Kinetic chain exercises

BCT 2.7. Balance and coordination exercises

BCT 2.8. Biophysics of contractile and non-contractile tissues, Response to mechanical loading

BCT 2.9. Clinical reasoning and differential clinical diagnosis based on various approaches such as Maitland, Kaltenborne, Cyriax, Mulligan, Mckenzie etc.

BCT 2.10. Proprioceptive neuromuscular Facilitation,

BCT 2.11. Hydrotherapy Techniques

BCT 2.12. Functional assessment and re-education

BCT 2.13. Yoga: Introduction, Historical background and Origin of Yoga, Meaning and Concept of Yoga and its relationship with Physical Education and Sports, Yoga in Global Scenario, Pranayama: Meaning, Types and its importance. Asanas: Asanas- meaning, types, principles, Techniques of asanas and effects of asanas on various systems of the body - circulatory, respiratory and digestive system.

BCT 2.14. Electro diagnosis: introduction to methods of electro diagnosis SD CURVE

BCT 2.15. Electromyography: technique of EMG, interpretation of normal and abnormal responses

BCT 2.16. Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurement of NCV of nerves of upper limb and lower limb, interpretations of normal and abnormal responses.

BCT 2.17. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP, SSR.

BCT 2.18. Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of:

1. Superficial heating modalities
2. Deep heating modalities
3. Ultrasound
4. Cryotherapy

BCT 2.19. Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of Physiotherapy

BCT 2.20. Low Frequency Current: Diadynamic Current, Iontophoresis

BCT 2.21. High Voltage, Pulsed Galvanic Stimulation, TENS, IFT, Russian Currents. LASER

BCT 2.22. Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars, keloids, Muscle Plasticity & Integumentary Conditions.

BCT 2.23. Bio-feed Back

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)	MPT (N) - 104	1	Theory	8	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Elicit and interpret clinical signs and symptoms of diseases commonly seen in Neurology medicine & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions. **(SH)**	3	3	2	2	2	2	1	1	2	2
CO2: Generate a primary physical diagnosis and a list of differential diagnoses consistent with typical presentations. **(SH)**	3	3	2	2	2	2	1	1	2	2
CO3: Identify normal & pathological anatomy on diagnostic images. **(KH)**	3	2	1	2	1	2	-1	1-	2	2
CO4: Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Neurological physiotherapy practice. **(KH)**	3	2	2	3	2	2	2	2	2	1
CO5: Demonstrate a broad range of technical skill in diagnosing the physiotherapy related neurology conditions. **(P)**	3	3	2	2	2	3	2	1	2	2

B. COURSE CONTENTS:

SECTION- A

NCPFD 1.1. ICF conceptual frame work

NCPFD 1.2. Importance of assessment & evaluation, Outlines of principles and Methods of evaluation

NCPFD 1.3. Need and types of Documentation

NCPFD 1.4. Critical decision making and selection of outcome measures in Musculoskeletal Physiotherapy

NCPFD 1.5. Assessment, differential diagnosis and diagnosis of various Neurology conditions

NCPFD 1.6. Associated functional disturbances of higher function and their testing

NCPFD 1.7. NCPFD 1.8. Outcome measures used in Neuro-physiotherapy-for Cognitive impairment and disability, Focal disabilities, Global measures of disability, Motor impairment, ADL and extended ADL tests, Person with Disabilities and quality of life, Multiple Sclerosis, Parkinson 's disease, Stroke, Head injury, Spinal cord injury, Pain scales Clinical analysis of posture, movement and gait, use of gait analyzer

NCPFD 1.9. Principles, Techniques and interpretation of Pathological investigations and diagnostic imaging (CT, MRI, Ultra sound, PET, fMRI, bone scan and other diagnostic imaging) for diagnosis of neurological conditions.

NCPFD 1.10. Clinical examination and detection of movement dysfunction

NCPFD 1.11. Evaluation of ANS dysfunction with reference to Psycho physiological testing

NCPFD 1.12. Motor control assessment, reflexes and automatic reactions

NCPFD 1.13. Neurodevelopment assessment

SECTION- B

NCPFD 2.1. Assessment of Hand Function

NCPFD 2.2. Voluntary control assessment

NCPFD 2.3. Neuropsychological tests

NCPFD 2.4. Electrophysiological assessment devices – Instrumentation, Characteristics and components EMG (Qualitative and Quantitative EMG), NCV, Conventional Methods, RNS, EPS, EEG related to neurological disorders with interpretation.

NCPFD 2.5. Physical disability evaluation and disability diagnosis

NCPFD 2.6. Assessment of progressive locomotor disorder- Neuropathic, myopathic and NMJ conditions

NCPFD 2.7. Assessment and scales for diagnosis of pain

NCPFD 2.8. Biomarkers specific to neurological disorders

NCPFD 2.9. Assessment of Emotional Intelligence

NCPFD 2.10. Assessment of Peripheral nerve injuries and Cranial nerve disorders.

NCPFD 2.11. Neurophysiology and evaluation of Balance and Coordination

NCPFD 2.12. Assessment of Physical and Neurological Functions of Patients in ICU.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Clinical, Physical and Functional diagnosis in Neuro-Physiotherapy (NCPFD)	MPT (N) - 104 (P)	1	Practical	4	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform a comprehensive, ICF-based neurological evaluation including history, higher mental function, cranial nerve, motor control, reflex, tone, sensory, balance, coordination, posture, gait and neurodevelopmental assessment on patients across acute, ICU and community settings. **(P)**	3	3	2	1	2	2	-	1	2	2
CO2: Demonstrate the administration, scoring and interpretation of standardised outcome measures and disability evaluation tools and justify their selection through critical decision-making. **(P)**	3	3	2	2	2	2	1	2	3	3
CO3: Analyse and interpret electrophysiological investigations, diagnostic imaging, biomarkers and pathological reports to correlate findings with the patient's clinical presentation. **(SH)**	3	3	2	3	1	2	-	-	2	3
CO4: Formulate an integrated clinical, physical and functional diagnosis with prioritised problem list, goals and disability diagnosis, and document it accurately using standardised formats and professional terminology. **(P)**	3	3	3	3	3	2	2	2	2	2

CO5: Present and defend neurological case studies and viva responses, communicating findings ethically and effectively to patients, caregivers and the multidisciplinary team while appraising current evidence to support diagnostic reasoning. **(P)**	2	2	3	3	3	3	3	3	3	3

B. COURSE CONTENT:

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of neurology conditions/diseases mentioned in theory
3. General Viva
4. Case Studies

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Skills acquisition and refinement (SAR-I)	MPT - 105	1	Practical	8	240

A. COURSE OUTCOMES (CO) FOR LOCOMOTOR DISABILITY:

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Interpret the statutory framework governing locomotor disability in India (PWD Act 1995, RPWD Act 2016, and current Gazette notifications) and apply prescribed guidelines to determine eligibility for disability certification. **(KH)**	3	1	1	-	3	2	-	2	2	1
CO2: Perform systematic assessment and quantification of permanent physical impairment using standardized methods (ROM, manual muscle testing, limb-length/amputation measurement) and compute disability percentage as per Gazette-notified formulae. **(SH)**	3	3	1	-	2	2	-	1	1	2
CO3: Generate accurate, legally valid disability certificates and supporting documentation while adhering to medico-legal, ethical, and professional accountability standards. **(P)**	2	3	2	1	3	2	-	2	1	-
CO4: Communicate assessment findings and certification outcomes effectively and sensitively to persons with disability, families, and members of the multidisciplinary health team. **(P)**	1	1	3	3	2	1	2	2	-	-
CO5: Critically appraise evolving disability-assessment guidelines and evidence to sustain current, socially	2	1	1	-	2	2	2	3	3	3

accountable practice and contribute to advocacy for persons with disability. **(KH)**										

B. COURSE CONTENT FOR LOCOMOTOR DISABILITY:

1. Disability (Permanent Physical Impairment) Assessment and Certification Guidelines & Gazette Notification:
2. Detailed study of Government Gazette to be done: (The Gazette of India is regularly updated, and its publications can change over time. Refer the recent Gazette publications issued by the Government of India, from the official website)
3. PWD Act 1995 and Rights of person with Disability Act 2016, to study in detail.

C. COURSE OUTCOMES (CO) FOR BLS AND ALS:

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform Opening and maintaining and patent airway: assessment and knowledge of airway maneuvers and adjuncts. **(SH)**	3	3	1	1	1	2	-	1	1	-
CO2: Ventilate patients: Assessment and management of breathing with Mouth to mouth and mouth to mask. **(SH)**	3	3	1	1	2	2	-	1	1	-
CO3: Administer basic life support skills including cardiopulmonary resuscitation. **(SH)**	3	3	2	2	2	3	1	2	2	-
CO4: Provide first aid of simple and multiple system trauma such as: ● Controlling haemorrhage ● Managing Burns and wounds ● Response to effects of weapons of mass destruction ● Manually stabilizing injured extremities **(SH)**	3	3	2	2	2	2	1	2	2	-
CO5: Provide first aid to patients with medical emergencies like heart attack and stroke ● Identifying signs of Stroke and heart attack and safe transfer after first aid without delay in transfer. ● Manage general medical complaints seizures and animal bites (snake /dog bite) **(SH)**	3	3	2	2	2	2	1	2	2	-
CO6: Reassure patients and bystanders by working in a confident, efficient manner	1	2	3	2	3	3	2	2	1	-

• Avoid mishandling and undue haste while working expeditiously to accomplish the task **(SH)**										
CO7: Manage safe patient transport Entailing-Extrication of the victim, helmet removal and spine protection during transport. **(SH)**	3	3	2	2	2	2	1	2	1	-
CO8: Explain Roles, responsibilities and limitations of first responder. **(KH)**	2	2	2	2	3	2	2	2	1	-

D. COURSE CONTENT FOR BLS AND ALS:

SECTION -A

Unit - 1

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

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

ECLS 1.3. Well-being of first responder Personal protection

1. Steps to be taken against airborne and blood-borne pathogens

2. Personal protective equipment necessary for each of the following situations: Hazardous materials Rescue Operations Violent Scenes Crime scenes

3. Electricity, Water and ice

4. Exposure to blood-borne pathogens Exposure to airborne pathogens

Unit - 2

ECLS 2.1. Airway

1. Signs of inadequate breathing

2. Mechanism of injury to opening the airway

3. Steps in the head-tilt chin-lift

4. Steps in the jaw thrust

5. Taking out foreign body

6. Ensuring patent airway during seizures and vomiting.

ECLS 2.2. Ventilation

1. Of a patient with a mask or barrier device

2. Steps in providing mouth-to-mouth and mouth-to-stoma ventilation

ECLS 2.3. Circulation

1. Evaluate the cardiac status of the patient

2. Determine the need for and take necessary action to proper circulation

3. Steps for control of bleeding: Pressure bandage and tourniquet

ECLS 2.4. Clearing a foreign body airway obstruction

ECLS 2.5. CPR

1. Implications of cardiac arrest

2. Cardiopulmonary resuscitation (CPR)

i. How it works

ii. Steps

iii. When to stop CPR

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

Section - B

Unit - 3

ECLS 3.1. Bleeding and Soft Tissue Injuries

1. Difference between arterial and venous bleeding

2. Stopping external bleeding

3. Identification of internal bleeding

4. Types and Functions of dressings and bandages

5. How to help a victim of burn injury

ECLS 3.2. Injuries to Muscles and Bones

1. Suspecting bony/spinal injury

2. Splinting –materials used

3. Importance of splinting

Unit - 4

ECLS 4.1 Medical Emergencies

ECLS 4.2 Identification of the patient steps in providing first aid to a patient with

i. A general medical complaint –

ii. Seizures

iii. Chest-pain

iv. Shortness of breath

v. Exposure to heat

vi. Including other medical complaints like allergy, diarrhoea, fainting, low blood sugar, stroke

vii. Drowning

viii. Poisoning

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

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

Practical for BLS & ALS:

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

ECLS (P) 5.1. Provide Airway & Ventilation

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

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

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

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

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

ECLS (P) 5.7. Demonstrate Stretcher use

Recommended text books for ECLS

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

E. COURSE OUTCOMES (CO) FOR DISASTER MANAGEMENT:

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Understand the crucial role physical therapists play in disaster management, particularly within Emergency Medical Teams. **(K)**	3	1	-	3	-	2	-	2	-	-
CO2: Identify national and international organizations that play a vital role in disaster management. **(K)**	3	-	-	1	-	-	-	1	2	-
CO3: Identify the legal framework for disaster management in India and disaster prone areas. **(K)**	2	-	-	-	3	-	-	2	-	-
CO4: Provide essential information to other physical therapists interested in disaster response work and to make them aware of national and international agencies already active in the field. **(KH)**	2	-	3	1	-	-	3	-	2	-
CO5: Promote global preparedness and support physical therapists in making a meaningful difference in disaster response and recovery efforts. **(KH)**	-	-	2	-	-	2	3	3	2	-

F. COURSE CONTENT FOR DISASTER MANAGEMENT:

DM 1.1. Definition of disaster and the hazards associated with disaster, Vulnerable groups in Disaster

DM 1.2. Definition of Advocacy, disability advocacy, Contingency planning wrt to disaster management, Hazard, Risk , Vulnerable groups

DM 1.3. History of involvement of Physiotherapists in rehabilitation efforts during emergencies

DM 1.4. National organisations who are involved in disaster preparedness and management strategies:

1. The legal framework for disaster management in India: Key takeaways of Disaster Management Act 2005, National Policy on Disaster Management 2009 and National Disaster Management Plan 2018

2. Different types of disasters managed in India, Epidemiologic surveillance and disease control, main goal of the National Disaster Management Authority, areas in India are most prone to disasters, Institutional structure for disaster management in India at various levels, Central Ministry that coordinates disaster management and leader of NDMA in India

3. Disaster Management Act of 2005 key take aways and its significance, Phases of Disaster management, Long term prevention measures, role of various stake holders in disaster management, role of community involvement in disaster management, challenges faced in disaster management in India

4. Prime minister's 10 point agenda and Community based and Technology driven approaches: Key policies and strategies

DM 1.5. International organisations who facilitate contributions of physiotherapists in disaster preparedness and management strategies. Role of physiotherapists in:

1. Disaster management within their own countries, benefits of rehabilitation provided following disasters

2. Prevention of a disaster

3. Preparedness for disaster with respect to essential locally appropriate preparedness for a disaster,

4. Identifying and connecting professional associations, health service providers and training institutions.

5. Developing international humanitarian response

6. Response to disaster: Required skills and knowledge and required actions and secure resources with respect to assessment, coordination, psycho-social support and advocacy

7. Recovery: with respect to planning of medical management and local capacity building and physiotherapy rehabilitation, advocacy

DM 1.6. The type and distribution of injuries caused by disasters, the type of hazards, common injuries that can lead to long-lasting or permanent disability.

DM 1.7. Clinical Practice in Response phase along with documentation (conservative and surgical), record management, data and research, informed consent and confidentiality, regulations and scope of practice, hand hygiene and infection control, communication, referral, discharge planning with respect to international management strategies.

DM 1.8. International Disaster Management Rehabilitation Response Plans and role of Physiotherapists with respect to: Systems in Place, Identifying Personnel, Facilities and Resources, Advocacy and Partnerships, Training and Capacity Building

DM 1.9. Elements to be considered "essential" components in any disaster education or training programme for health professionals as defined by Global Response Framework,

DM 1.10. The World Health Organization (WHO) : the lead UN agency in the health cluster and its emergency response framework and Humanitarian principles

Recommended websites for references:

National Disaster Management Plan, 2016. A publication of the National Disaster Management Authority, Government of India. May 2016, New Delhi at www.mha.gov.in

www.wcpt.org/disaster-management.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Clinical Training (CT-I)	MPT 106	1	Practical	23	690

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform a comprehensive, specialty-specific patient assessment (subjective history, systematic examination, validated outcome measures) and formulate a physiotherapy diagnosis independently during rotatory postings. (P)	3	3	2	1	-	2	-	-	1	1
CO2: Plan and execute evidence-based, patient-specific physiotherapy management across specialties, progressing or modifying intervention in response to clinical outcomes. (P)	3	3	1	2	1	3	-	1	2	2
CO3: Communicate professionally with patients, caregivers, and multidisciplinary team members, and maintain accurate, timely clinical documentation. (SH)	1	2	3	3	2	1	1	1	-	-
CO4: Demonstrate ethical, safe, and accountable clinical conduct including consent, patient dignity, infection control, and adherence to scope of practice. (SH)	1	2	1	2	3	2	1	2	-	-
CO5: Apply reflective self-appraisal and current evidence to improve clinical performance, showing commitment to lifelong learning and a scientific approach to practice. (SH)	1	1	-	-	1	2	2	1	3	2

B. COURSE CONTENT:

Clinical Training: Compulsory rotatory Clinical Posting as per the Speciality and Clinical Assessment during Clinical posting is mandatory.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Dissertation	MPT 107	1	Practical	8	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Critically appraise existing literature in the chosen specialty to identify a knowledge gap and formulate a focused, researchable question with a testable hypothesis. **(SH)**	2	-	1	-	-	2	-	1	3	3
CO2: Design a methodologically sound research protocol, including appropriate study design, sampling, outcome measures, and a defined statistical analysis plan. **(SH)**	2	1	-	-	1	2	-	-	2	3
CO3: Demonstrate ethical and regulatory compliance by securing Institutional Ethics Committee approval, Clinical Trial Registry (CTRI) registration where applicable, and valid informed consent, while safeguarding data integrity. **(SH)**	2	1	1	1	3	2	-	2	1	2

B. COURSE CONTENT:

Each candidate will have to carry out a dissertation on the Speciality related subject of MPT. Ethical approval certificate from the Registered Institutional Ethical committee and Clinical Trial Registration is mandatory for interventional Dissertation study topics. The dissertation to be guided by Guide of the speciality of faculty of physiotherapy of the department under whom the student is pursuing MPT. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean/Principals office with the result. The dean/ Principal's office will send the dissertation to the library for record.

2ND Year B.P.T Syllabus

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Exercise Physiology (EP)	MPT 201	2	Theory	8	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Comprehend the basic knowledge of sources of energy, aerobic and anaerobic synthesis of ATP along with the understanding of utilization of substrates in relation to the intensity and duration of exercise. **(KH)**	3	-	-	-	-	-	-	-	1	1
CO2: Appreciate the measurement of energy cost of exercise and importance of energy transfer and energy expenditure at rest and during various physical activities. **(KH)**	3	1	-	-	-	-	-	-	1	1
CO3: Understand the role of various macro and micro nutrients as well as their caloric requirements along with the basic classification, functions and utilization of nutrients. **(KH)**	3	-	-	-	-	-	-	-	1	1
CO4: Acquire about the importance of diet for various competitions, nutrient supplements for performance and to design caloric requirements for various sports and age groups. **(KH)**	3	2	-	-	-	-	-	-	2	2
CO5: Critically evaluate the central and peripheral mechanism that regulates the cardiovascular and respiratory systems in exercise along	3	2	-	-	-	-	-	-	2	3

with the physiological responses and adaptations of these systems to exercise and training. **(KH)**										
CO6: Identify the regulation and significance of acid base balance following exercise. **(KH)**	3	-	-	-	-	-	-	-	1	1
CO7: Understand the responses of various hormones with respect to exercise. **(KH)**	3	1	-	-	-	-	-	-	1	1

B. COURSE CONTENT:

Section - A

EP 1.1. Bioenergetics of exercise: High energy phosphates, Anaerobic and aerobic ATP synthesis, Bioenergetics Control, exercise intensity & substrate utilization, protecting CHO stores, muscle adaptation to endurance training, processes that potentially limit the rate of fat oxidation, regulation of substrate utilization, training - induced increase in FFA oxidization:

EP 1.2. Basal metabolic and resting metabolic rates and factors affecting them, Classification of Physical Activities by energy expenditure. Concept of MET measurement of energy cost of exercise

EP 1.3. Nutrition metabolism of Carbohydrate, fats, proteins, vitamin, mineral and water

EP 1.4. Nutrition in exercise optimum nutrition for exercise, nutrition for physical performance, pre-game meal carbohydrate loading, food for various athletic events, fluid and energy replacement in prolonged exercise

EP 1.5. Respiratory responses to exercise: Ventilation at Rest and during Exercise, Ventilation and the Anaerobic Threshold, static and dynamic lung volume. Gas diffusion, Oxygen and carbon dioxide transport second wind, stich by side control of pulmonary ventilation during exercise adaptive changes in the respiratory systems due to regular physical activities.

EP 1.6. Cardiovascular responses to exercise- Cardiovascular system and exercise, acute vascular effects of exercise, Circulatory responses to various types of exercise regulation of cardiovascular system during exercise, Pattern of redistribution of blood flow during exercise, adaptive responses of cardiovascular system to aerobic and anaerobic training. Athlete heart

EP 1.7. Exercise and Acid Base Balance: Acid and Bases, Buffers, pH, Respiratory Regulation of pH, Alkali Reserve, The kidneys and Acid base balance, Alkalosis and Acidosis, Acid base balance following heavy exercise.

EP 1.8. Hormonal responses to exercise with respect to Growth Hormone (GH), Thyroid and Parathyroid Hormones. Antidiuretic Hormone (ADH) and Aldosterone, Insulin and Glucagons, The catecholamine; epinephrine and norepinephrine. The sex hormones. The glucocorticoids (Cortisol) and Adreno Corticotropic Hormones (ACTH). Prostaglandins and Endorphins.

Section - B

EP 2.1. Training and conditioning: Physiological basis of physical training, training principles, interval training, continues running concept of anaerobic threshold and vo2 max, physiological effects of various physical training methods- aerobic and anaerobic training, strength training factors influencing training effects – intensity, frequency, duration, detraining, process of recovery, post exercise oxygen consumption factors affecting recovery process, overtraining

EP 2.2. Body temperature regulation during exercise: Mechanism of regulation of body temperature, Body temperature responses during exercise, Physiological responses to exercise in the heat, Acclimatization to exercise in the heat, Effects of age and gender on body temperature regulation during exercise, Physical activity and heat illness [heat exhaustion, dehydration exhaustion heat cramps & heat stroke] Prevention of Heat Disorders

EP 2.3. Exercise in the Cold: Effects of exposure to cold and severe cold, Wind chill, Temperature receptors, Role of hypothalamus, shivering, Frost Bite and other problems, Clothing and Environment

EP 2.4. Exercise at Altitude: Exercise at altitude immediate physiological responses at high altitude, physiological basis of altitude training, phases of altitude training and specific training

effects, altitude acclimatization, oxygen dissociation curve at altitude, disorders associated with altitude training

EP 2.5. Exercise and body fluids: Measurement and regulation of body fluids, Body fluid responses and adaptations to exercise, Effects of dehydration and fluid replenishment on physiological responses to exercise and performance Fluid/carbohydrate replacement beverages

EP 2.6. Physical activity, body composition, energy balance and weight control: Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome , Healthy weight loss, Ways and methods of weight reduction , fluid maintenance, disordered eating, nutritional ergogenic aids, diet supplements in athletes and others involved in physical activity.

EP 2.7. Exercise and Diabetes Mellitus: Exercise in insulin, requiring diabetes and non-insulin dependent diabetes mellitus, Effect of physical training on glucose tolerance and insulin sensitivity, Management of diabetes by diet and insulin

Recommended text books for EP

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. Lippincott Williams and Wilkins.
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill
3. Exercise Physiology: Powers, SK and Howley ET; Mc Graw Hill
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company
6. Komi, P. (Ed.) Strength and power in sport. Blackwell Scientific Publications.
7. Levick, J.R. An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann
8. McArdle, WD, Katch, FI & Katch, VL Exercise Physiology. Lippincott, Williams & Wilkins.

9. Shephard and Astrand Endurance in sport. Blackwell Scientific Publications.
10. Willmore, JH & Costill, DL Physiology of Sport and Exercise. 2nd ed. Human Kinetics.
11. Guyton, A.C. Textbook of Medical Physiology. Philadelphia: Saunders,
12. Nutrition for sport and exercise; Berning and Steen

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Neurological Physiotherapy (NPT)	MPT (N) 202	2	Theory		120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Develop a management plan, generally including some lifestyle factors, in cooperation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem. **(SH)**	3	3	2	2	2	2	1	2	2	2
CO2: Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with consideration for ethical, practical and pragmatic concerns. **(P)**	3	3	2	2	3	2	2	2	2	2
CO3: Maintain legal patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers. **(SH)**	2	2	3	3	3	2	1	2	1	-
CO4: Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients. **(KH)**	3	3	3	1	1	2	2	1	2	1

B. COURSE CONTENT:

SECTION -A

NPT 1.1. History of neurological Physiotherapy, Epidemiology, classification of Neurology disorders, ICF classification of Neurological Disorders, symptomatology, pathophysiology and management of Neurological Disorders.

NPT 1.2. Physiotherapy interventions of various disorders of Central Motor control

NPT 1.3. Physiotherapy interventions of various disorders of the Motor Unit – Neuropathies, Myopathies and Neuromuscular Junction Disorders.

NPT 1.4. Physiotherapy interventions for Autonomic Nervous system dysfunction

NPT 1.5. Physiotherapy intervention for Peripheral Nervous system conditions (injuries and lesions)

NPT 1.6. Physiotherapy interventions for Tonal abnormalities.

NPT 1.7. Physiotherapy intervention for Traumatic conditions of CNS

NPT 1.8. Physiotherapy management for Demyelinating, Inflammatory, Infectious and Degenerative conditions.

NPT 1.9. Physiotherapy management for CNS Neoplasia.

NPT 1.10. Metabolic and Deficiency Disorders and their management

NPT 1.11. Congenital Neurological Disorders and management

NPT 1.12. Disorders of Perception & Cognition & their Rehabilitation,

NPT 1.13. Sensory System Dysfunction and rehabilitation

NPT 1.14. Oromotor Dysfunctions and Management

NPT 1.15. Visual Deficits and its management.

SECTION- B

NPT 2.1. Vestibular Dysfunction and its rehabilitation

NPT 2.2. Psychosomatic conditions and management.

NPT 2.3. Neuro - Surgical conditions and its postoperative management.

NPT 2.4. Neuro-Physiotherapy management in Intensive Care Units (ICU).

NPT 2.5. Physiotherapy interventions for muscle imbalances and corrective measures. Musculoskeletal and Neurological complications of Locomotor Disorders

NPT 2.6. Pain Management

NPT 2.7. Adaptive and Assistive Functional Devices and technologies to improve neurological dysfunction.

NPT 2.8. Management of Bladder and Bowel Dysfunction

NPT 2.9. Neuro-physiotherapeutic approaches – Compensatory training approach, Muscle reeducation approach, Novel Approach, Neuro-physiological approaches - NDT, Brunnstrom, Roods, PNF, Sensory integration therapy. Motor relearning program, Constraint Induced movement therapy, Task Oriented approach, Novel approach, Vojta therapy. Biofeedback training, Neural mobilization and Neuro Dynamics, Sensory rehabilitation, Body Weight Supported Treadmill Training, Myofascial Release Technique, Inhibitory and Facilitation technique, Functional Re-Education, Learning skills, A.D.L, Tapping in neurological conditions.

NPT 2.10. FES, NMES, Biofeedback, Various equipment used in Neuro-physiotherapy

NPT 2.11. Problem Based Learning clinical conditions in Neurology physiotherapy.

NPT 2.12. Pharmacology in Neurophysiotherapy.

NPT 2.13. Training of Emotional Intelligence.

NPT 2.14. Hydrotherapy for Neurological conditions.

NPT 2.15. Palliative Care Approach.

NPT 2.16. Physiotherapy Management of Cerebellar Disorders.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Neurological Physiotherapy (NPT)	MPT (N) - 202 (P)	2	Practical	4	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform a comprehensive neurological physiotherapy assessment history, higher mental function, cranial nerve, sensory, motor, tone, reflex, coordination, balance, gait, perception–cognition, oromotor and vestibular examination and interpret findings using standardized outcome measures and the ICF framework to arrive at a physiotherapy diagnosis. **(P)**	3	3	2	1	2	3	2	1	2	2
CO2: Formulate and justify individualized, ICF-based short- and long-term goals and evidence-informed treatment plans for disorders of central motor control, motor unit, peripheral nerve, tonal abnormalities, degenerative, demyelinating, infectious, congenital, metabolic and neoplastic conditions, using structured clinical reasoning. **(P)**	3	3	2	2	2	2	2	1	2	2
CO3: Demonstrate and apply neurophysiological, motor-learning and technology-assisted interventions with correct technique, dosage, progression and patient safety. **(P)**	3	3	2	1	3	3	2	2	2	2
CO4: Execute safe physiotherapy management in complex and high-dependency settings neuro-ICU, post-neurosurgical, traumatic CNS injury,	3	3	3	3	3	3	3	2	2	2

palliative care, bladder–bowel dysfunction and prescribe appropriate adaptive/assistive devices and functional technologies, with due regard to precautions, red flags and pharmacological interactions. **(P)**										
CO5: Present, defend and document neurological case studies and viva discussions; communicate effectively with patients, caregivers and the multidisciplinary team; and demonstrate ethical conduct, emotional intelligence, evidence appraisal and reflective self-directed learning in practice. **(P)**	2	2	3	3	3	3	3	3	3	3

B. COURSE CONTENT:

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of neurology conditions/diseases mentioned in theory
3. General Viva
4. Case Studies

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Recent advances and Evidence Based practice in Neuro-Physiotherapy (NRAEB)	MPT (N) - 203	2	Theory	8	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Understand and apply the information regarding recent advances in Neuro Physiotherapy for patient care. **(KH)**	3	3	1	1	2	2	2	1	2	2
CO2: Search the evidence available for assessment and management of neurological conditions. **(SH)**	2	2	1	1	2	2	1	1	3	3
CO3: Apply the evidence available for the management of various neurological conditions. **(SH)**	3	3	2	1	2	3	2	2	3	3

B. COURSE CONTENT:

SECTION A:

NRAEB 1.1. Basics of Genetic counseling, Stem cell therapy, Gene therapy

NRAEB 1.2. Recent advances in Pain Modulation and Rehabilitation.

NRAEB 1.3. Recent advances in Vocational Rehabilitation in Neurology Disorders with disability

NRAEB 1.4. Recent advancement in Neurology Orthosis – prescription and training.

NRAEB 1.5. Psychiatry problems in Neurological conditions and Physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of neurological disabilities

NRAEB 1.6. Institutional & community-based rehabilitation for Neurological Dysfunction.

NRAEB 1.7. Recent Neuro Physiotherapy technique - Mental Imagery technique, Virtual Reality Therapy/Virtual Clinic, Robotic Movement Therapy, Pilates therapy, Mirror Box therapy, Mime therapy, Floatation Therapy, Cupping Therapy, Jadestone Therapy, Matrix Rhythm Therapy, IASTM and Dry needling, CranioSacral therapy, Neurodynamics in Neurological conditions and

Neural Mobilization, Hippo-therapy, Transcranial Direct Current Stimulation, Transcranial Magnetic Stimulation, Artificial Intelligence, Whole Body Vibrator and Neuromuscular Technique

NRAEB 1.8. Eclectic Approach.

SECTION- B

NRAEB 2.1. History of Evidence Based Practice in Neurological Physiotherapy, Clinical Decision Making, importance of Evidence Based Practice, Evidence about prognosis, experience and diagnosis, locating evidences, challenges and barriers in EBP.

NRAEB 2.2. Evidences in interventions for Neurological Impairments (Sensory, Motor, Cognitive and Perceptual)

NRAEB 2.3. Evidences for Physiotherapy in Traumatic CNS conditions

NRAEB 2.4. Evidences in Physiotherapy management of Stroke, Cerebellar Ataxia.

NRAEB 2.5. Evidences in Physiotherapy management of Peripheral Nerve Injuries

NRAEB 2.6. Evidences in Physiotherapy management of Parkinson's Disease

NRAEB 2.7. Evidences in Physiotherapy management of Myopathies, Neuropathies and NMJ Disorders

NRAEB 2.8. Sports training in Neurological Physiotherapy.

NRAEB 2.9. Tele rehabilitation in Neurological Physiotherapy

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Recent advances and Evidence Based practice in Neuro-Physiotherapy (NRAEB)	MPT (N) - 203 (P)	2	Practical	4	120

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform a comprehensive advanced neurological evaluation including standardised outcome measures, impairment-level analysis and ICF-based problem listing and formulate prioritised, measurable goals for a given neurological case. **(P)**	3	3	2	1	2	3	1	2	2	2
CO2: Demonstrate contemporary neuro-physiotherapy techniques with correct indications, dosage, contraindications and safety screening.	3	3	2	1	3	3	1	1	1	2
CO3: Critically appraise current evidence relevant to a presented neurological case, and justify an eclectic, evidence-informed intervention plan through structured clinical reasoning and clinical decision-making. **(SH)**	3	3	2	3	2	3	2	1	3	3
CO4: Design and execute individualised, evidence-based management programmes for stroke, traumatic brain/spinal cord injury, Parkinson's disease, cerebellar ataxia, peripheral nerve injuries, myopathies, neuropathies and NMJ disorders, incorporating orthotic prescription, gait/sports-specific training and progression criteria. **(P)**	3	3	3	3	3	3	2	2	2	2

CO5: Plan and deliver rehabilitation across care settings institutional, community-based and tele-rehabilitation integrating psychological adaptation, behavioural/cognitive-behavioural strategies, vocational reintegration and caregiver education, while communicating ethically and effectively within a multidisciplinary team. **(P)**	2	2	3	3	3	2	3	3	2	2

B. COURSE CONTENT:

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of neurology conditions/diseases mentioned in theory
3. General Viva
4. Case Studies

Recommended text books for Neurosciences:

1. American Psychological Association. Publication Manual of the American Psychological Association. Washington, DC.
2. Domholdt, E. Physical Therapy Research: Principles and Applications. WB Saunders, Philadelphia, USA.
3. Kuzma, J. W., & Bohnenblust, S. E. Basic Statistics for the Health Sciences. McGraw Hill, Boston.
4. Munro, B. H. Statistical Methods for Healthcare Research. Lippincott, Philadelphia.
5. Coakes, S. J., & Steed, L. G. SPSS: Analysis Without Anguish. John Wiley & Sons Inc, Milton, Australia.
6. Jenkins, S., Price CJ, & Straker L. The Researching Therapist: A Practical Guide to Planning, Performing and Communicating Research. Churchill Livingstone, Edinburgh.
7. Campbell, M. J., & Machin, D. Medical Statistics: A Commonsense Approach. John Wiley, Chichester, UK.

8. Domholdt, E. Rehabilitation Research: Principles and Applications. WB Saunders, Philadelphia.
9. Gowitzke, B. A. Scientific Basis of Human Movement. Williams & Wilkins, Baltimore.
10. Masoro, E. J. Handbook of Physiology in Aging. CRC Press, Florida.
11. Hicks, C. Research for Physiotherapists. Churchill Livingstone, Edinburgh.
12. Polgar, S. Introduction to Research in Health Sciences. Churchill Livingstone, London.
13. Currier, D. P. Elements of Research in Physical Therapy. Williams & Wilkins, Baltimore.
14. Sproull, N. L. Handbook of Research Methods. Scarecrow Press, New Jersey.
15. Wilenski, P. Public Power and Administration. Hale & Iremonger, Sydney.
16. Hickok, R. J. Physical Therapy Administration and Management. Williams & Wilkins, Baltimore.
17. Nosse, L. J. Management Principles for Physiotherapists. Williams & Wilkins, Baltimore.
18. Carpenter, M. B. Human Neuroanatomy. Williams & Wilkins, Baltimore.
19. Fraser, B. A. Physical Management of Multiple Handicapped. Williams & Wilkins, Baltimore.
20. Aisen: Orthotics in neurological rehabilitation. Demos Publication, New York
21. Delisa: Manual of nerve conduction velocity techniques. Raven press, New York
22. Kimura J, F.A Davis: Electrodiagnosis in diseases of nerve and muscle. Philadelphia
23. O' Sullivan, F. A Davis: Physical rehabilitation: Assessment and treatment. Philadelphia
24. Farber: Neuro – rehabilitation. W.B. Saunders, Philadelphia
25. Kerb D: Bio- Feedback – A practitioners guide. Guiford press
26. Black I: The neural basis of motor control. Churchill, Livingstone, London
27. Turnbull Gerode I: Physical therapy management of Parkinson's disease. Churchill, Livingstone, London
28. Bobath B: Abnormal postural reflex activity caused by Brain Lesions. Aspen publications, Rockville
29. Eagel: Disorders of Voluntary Muscle. Churchill, Livingstone Edingburgh
30. Knot M. and Voss: Proprioception, neuro muscular facilitation techniques. Harper and Row, New York
31. Laidler, Capman and Hall: Stroke rehabilitation. London

32. Carr J.H, Shephered R.B: Motor relearning programme for stroke. Aspen publication, Rock Ville
33. Bobath B. Heinmann: Adult hemiplegia evaluation and treatment: London
34. Brombley: Paraplegia and tetraplegia. Churchill, Livingstone, Edingburgh
35. Measurement in Physical therapy – Churchill, Livingstone, London
36. Maria stokes: Physical management neurological rehabilitation, Elsevier, Mosby.
37. Misra U.K, Kalita J: Clinical Neurophysiology NCV, EMG, Evoked Potentials, Elsevier, New Delhi
38. Joel A Delisa, Gans B.M: Rehabilitation medicine principles and practice, revan, Philadelphia, New York
39. Robert Gunzbng, Marek Szpalski: Whiplash Injuries, current concepts in prevention diagnosis and treatment, Lippincot Williams & wilkins
40. Krusen's: Hand book of physical rehabilitation, kottke, lehmann, Saunder's Publications
41. Ropper A.H, Brown R.H: Adam and victors principle of neurology, Mcgraw – hill companies USA
42. Richard S. Snell: Clinical Neuroanatomy for medical students, Lippincott Williams & wilkins
43. Martha Freeman Somers: Spinal cord injury functional rehabilitation
44. David S Butler: Mobilisation of the nervous system Churchill Livingstone, New York
45. Darcy A. Umphred: Neurological rehabilitation, Mosby, Sydney
46. Lindsay, K. W., & Bone, I. Neurology and Neurosurgery Illustrated. Churchill Livingstone.
47. Beal, M. F., Lang, A. E., & Ludolph, A. Neurodegenerative Diseases. Cambridge University Press, USA.
48. Suarez, J. I. Critical Care Neurology and Neurosurgery. Humana Press, USA.
49. Lynch, D. R. Neurogenetics: Scientific and Clinical Advances. Taylor & Francis Group, New York.
50. Asbury, A. K., McKhann, G. M., & McDonald, W. I. Diseases of the Nervous System (Vol. I & II). McArthur, 3rd edition.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Dissertation (DSS-II)	MPT - 204 (P)	2	Practical	22	660

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Execute the study, collect and manage data, and apply appropriate statistical methods to analyse and interpret findings. **(P)**	2	2	-	-	1	2	-	1	2	3
CO2: Communicate the research through a structured scientific dissertation and defend it in an oral examination, adhering to accepted scientific writing and referencing standards. **(P)**	1	-	3	1	1	2	1	1	2	3

B. COURSE CONTENT:

Each candidate will have to carry out a dissertation on the Speciality related subject of MPT. Ethical approval certificate from the Registered Institutional Ethical committee and Clinical Trial Registration is mandatory for interventional Dissertation study topics. The dissertation to be guided by Guide of the speciality of faculty of physiotherapy of the department under whom the student is pursuing MPT. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean/Principals office with the result. The dean/ Principal's office will send the dissertation to the library for record.

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Skills Acquisition and Refinement (SAR-II)	MPT - 205 (P)	2	Practical	8	240

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform advanced and specialised physiotherapy examination, assessment, and intervention skills independently and safely across a range of clinical presentations. **(P)**	3	3	1	-	2	2	-	-	1	1
CO2: Demonstrate refined manual, therapeutic, and technical handling skills, adapting technique, positioning, and dosage to patient-specific needs. **(P)**	3	3	1	-	2	3	-	-	2	1
CO3: Analyse and integrate clinical reasoning and current best evidence into the selection, modification, and justification of clinical skills. **(SH)**	3	3	1	-	1	2	-	1	3	3
CO4: Demonstrate effective communication of clinical findings, treatment rationale, and instructions to patients, caregivers, and multidisciplinary team members. **(SH)**	1	2	3	3	2	2	1	2	-	-
CO5: Perform clinical skills with professional ethics, patient safety, accountability, and a commitment to continuous self-improvement. **(P)**	1	2	1	2	3	3	2	2	3	1

B. COURSE CONTENT:

Master's candidates should be subjected to at least 4-hrs of formal teaching per week per subject.

The departments may select a mix of the following sessions:

- Journal club once a week Seminar;
- Lecture twice a week
- Case discussions twice a week
- Interdepartmental case or seminar once a week

Course Name	Course Code	Year	Course Description	Credit	Total Hours
Clinical Training (CT-II)	MPT - 206 (P)	2	Practical	20	660

A. COURSE OUTCOMES (CO):

Course Outcome Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO1: Perform a comprehensive, specialty-specific patient assessment (subjective history, systematic examination, validated outcome measures) and formulate a physiotherapy diagnosis independently during rotatory postings. (P)	3	3	2	1	-	2	-	-	1	1
CO2: Plan and execute evidence-based, patient-specific physiotherapy management across specialties, progressing or modifying intervention in response to clinical outcomes. (P)	3	3	1	2	1	3	-	1	2	2
CO3: Communicate professionally with patients, caregivers, and multidisciplinary team members, and maintain accurate, timely clinical documentation. (SH)	1	2	3	3	2	1	1	1	-	-
CO4: Demonstrate ethical, safe, and accountable clinical conduct including consent, patient dignity, infection control, and adherence to scope of practice. (SH)	1	2	1	2	3	2	1	2	-	-
CO5: Apply reflective self-appraisal and current evidence to improve clinical performance, showing commitment to lifelong learning and a scientific approach to practice. (SH)	1	1	-	-	1	2	2	1	3	2

B. COURSE CONTENT:

Clinical Training: Compulsory rotatory Clinical Posting as per the Speciality and Clinical Assessment during Clinical posting is mandatory.

21. MODEL PAPERS:

MPT 1ST YEAR EXAMINATION: PAPER-SETTER INSTRUCTIONS

1	Set exactly 5 questions of 20 marks each (total 100, 3 hours). All compulsory. Every question must have 2 – 4 sub-parts whose marks add up to exactly 20.
2	Build every question on a real clinical, research, or ethics scenario; not a bare topic. The vignette must carry enough specific detail (setting, numbers, constraints) that a generic textbook answer cannot score.
3	Tag every sub-part with [CO ; Bloom's level]. No sub-part may go untagged. Ensure all Course Outcomes of the subject are covered across the paper, with none left out or over-used.
4	Keep the paper cognitively high. At least 60% of marks must sit at L4–L6 (Analyse / Evaluate / Create). L1 (Remember) stays under 10% and is never a standalone question; only a foundation part.
5	Design each question as a staircase; start lower and climb (typical: L2 → L4 → L5 → L6), exactly like the model ethics question.
6	The bloom's weightage: L1 - 5%; L2 - 10%; L3 - 15%; L4 - 25%; L5 - 25%; L6 - 20%
7	Reward reasoning, not volume. Give higher marks to parts needing more justification. Where the scenario allows an unsafe or unlawful "confident" answer, build that trap deliberately; such answers must not pass that sub-part.
8	Submit a model answer and component-wise marking scheme with every question, showing how each sub-part's marks are split and separating reasoning marks from recall marks.

Question Paper Structure:

Subject Code **Subject Abb.**

MPT (Main/ Remanded) Examination Month /Year

Subject Name

Paper I

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q1. Write Question Stem Here *[CO: ___ ; L:__]*

Q2. Write Question Stem Here *[CO: ___ ; L:__]*

Q3. Write Question Stem Here *[CO: ___ ; L:__]*

Q4. Write Question Stem Here *[CO: ___ ; L:__]*

Q5. Write Question Stem Here *[CO: ___ ; L:__]*

MPT 101 **LEM**

MPT (Main/ Remanded) Examination Month /Year

Laws, Ethics & Administration and Educational Methodology

Paper I

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A postgraduate scholar in your department proposes a randomised controlled trial of a novel neuromuscular electrical stimulation protocol in institutionalised elderly residents with moderate dementia at a government-run home. Several residents cannot comprehend the consent document; the home's superintendent offers to sign "on behalf of all residents". The protocol offers a stipend of ₹500 per session. You are the Member-Secretary of the Institutional Ethics Committee. **(6+5+5+4)**

(a) List the parts of a valid informed consent document. Also describe how consent should be taken. *[CO1, CO2 ; L2]*

(b) Using the four principles of bioethics, point out the ethical problems in this study.

[CO1, CO2 ; L4]

(c) Explain why these participants are called "vulnerable", and why the payment of ₹500 per session is a problem. *[CO1, CO2 ; L5]*

(d) Decide whether the ethics committee should approve, ask for changes, or reject this study. Give your decision and list the changes you would ask for. *[CO1, CO2 ; L6]*

Q.2 An MPT student has finished her dissertation and is writing a paper from it. She collected and analysed all the data. The Head of Department, who did not plan or read the study, asks for first authorship. The statistician who did the analysis is only thanked in the acknowledgements. The study was funded by the company that makes the device tested, and the paper recommends that device by its brand name. The plagiarism software shows 26% similarity, mostly in the introduction. **(6+5+5+4)**

(a) State the four ICMJE criteria for authorship. Explain who should be an author and who should only be acknowledged. *[CO1, CO2 ; L2]*

(b) Identify the four ethical problems in this case and name the breach in each.

[CO1, CO2 ; L4]

(c) Explain why a plagiarism software score alone is not enough to prove or disprove plagiarism.

[CO1, CO2 ; L5]

(d) Write four rules for a departmental policy that would have prevented all these problems.

[CO1, CO2 ; L6]

Q.3 You have been asked to set up a new physiotherapy department in a 200-bed hospital. You are given 1,800 square feet, a fixed budget, and permission to hire staff. Patients will come from orthopaedics, ICU, cardiology and neurology. **(6+5+5+4)**

(a) Explain the five functions of management. For each function, give one decision you would take while setting up this department. *[CO3, CO4 ; L3]*

(b) Choose three quality indicators for your department. For each, explain how you would measure it. *[CO3, CO4 ; L4]*

(c) Describe the steps of the medical audit cycle. Show how you would use it to improve one of your indicators. *[CO3, CO4 ; L5]*

(d) Plan the department space, staff and equipment. Explain two decisions where you had to give up something because of the budget. *[CO3, CO4 ; L6]*

Q.4 A first-year MPT student scores well in written exams. But in the clinic she cannot decide which tests to do for a patient in front of her. She can name all the shoulder special tests but cannot choose or order them. Her supervisor's only feedback so far has been "be more confident". **(6+5+5+4)**

(a) Explain the difference between Bloom's Taxonomy, Miller's Pyramid and the Dreyfus model. State what each one is used for. *[CO5, CO4 ; L2]*

(b) Explain why the written exam did not detect her problem. Name the level of Miller's Pyramid at which she is failing. *[CO5, CO4 ; L4]*

(c) Write three learning outcomes for this student. Place each one on the correct level of Miller's Pyramid, and state how you would assess it. *[CO5, CO4 ; L5]*

(d) Plan the teaching method and the feedback session you would use. Explain why "be more confident" is poor feedback. *[CO5, CO4 ; L6]*

Q.5 You plan to start a private physiotherapy clinic along with a paid online-plus-offline course for working physiotherapists. You want to advertise on social media, promise a "money-back guarantee of complete cure" for back pain, and give certificates to those who finish your course. **(6+5+5+4)**

(a) Explain the main principles of adult learning. Show how each one would change the way you design your course. *[CO5, CO2 ; L2]*

(b) Explain the four levels of Kirkpatrick's model. State what you would measure at each level to prove your course worked. *[CO5, CO2 ; L4]*

(c) Identify the parts of your plan that are unlawful or professionally wrong. Give the reason and the law or code for each. *[CO5, CO2 ; L5]*

(d) Rewrite the plan so that it is lawful and ethical. Defend your changes. *[CO5, CO2 ; L6]*

MPT 102 **RMB**

MPT (Main/ Remanded) Examination Month /Year

Research Methodology, Biostatistics and Evidence Based Practice

Paper II

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 Patients in your department cannot tolerate heavy weight training soon after knee ligament surgery. You want to test whether low-load training with blood flow restriction works as well as normal heavy training. You plan to measure thigh muscle strength and knee function at 12 weeks. **(6+5+5+4)**

(a) Write this problem as a research question in PICO format. Name the study design you would use and give one reason for your choice. *[CO1, CO2 ; L3]*

(b) Explain randomisation, allocation concealment and blinding. For each one, state the bias it prevents. *[CO1, CO2 ; L4]*

(c) Explain what decides the sample size of this study. Show where Type I error and Type II error enter the calculation. *[CO1, CO2 ; L5]*

(d) Choose one primary and one secondary outcome measure. Justify each using reliability, validity, responsiveness and MCID. *[CO1, CO2 ; L6]*

Q.2 A study compared three groups Group A (manual therapy + exercise), Group B (exercise alone) and Group C (no treatment). Pain was measured on a 100 mm VAS at baseline, 4 weeks and 12 weeks in 90 patients. The results are given below. **(6+5+5+4)**

Group × Time interaction: $F(4, 174) = 6.42$, $p = 0.003$, partial $\eta^2 = 0.13$

At 12 weeks:

A vs B = 8.1 mm (95% CI 2.4 to 13.8), $p = 0.004$;

A vs C = 21.5 mm (95% CI 15.2 to 27.8), $p < 0.001$.

Known MCID for VAS in this condition = 20 mm.

Patients lost to follow-up: A = 4, B = 3, C = 11.

(a) Name the study design. Explain why a mixed-model ANOVA is used instead of repeated t-tests. List the assumptions of this test. *[CO3, CO1 ; L2]*

(b) Interpret the given output. Explain what the interaction term and the partial η^2 tell you.

[CO3, CO1 ; L4]

(c) The authors say “manual therapy plus exercise is better than exercise alone”. Judge this claim against the MCID. Explain the difference between statistical significance and clinical importance. *[CO3, CO1 ; L5]*

(d) More patients dropped out from Group C than from the other groups. Explain the bias this creates. State whether you would demand an intention-to-treat or a per-protocol analysis, and why. *[CO3, CO1 ; L6]*

Q.3 A new paper claims that a dry-needling protocol “removes” chronic neck pain. In the study: 40 patients; treatment allotted alternately by the treating therapist; the outcome assessor knew the group; the main outcome was changed from disability to pain after looking at the data; 22% of patients dropped out and were left out of the analysis; the study was funded by the company that sells the needles; the final p value was 0.048. **(6+5+5+4)**

(a) Place this study in the hierarchy of evidence. List the domains of a standard risk-of-bias tool for randomised trials. *[CO4 ; L2]*

(b) Name the bias created by each of the six features listed above. *[CO4 ; L4]*

(c) For each bias, state whether it would make the treatment look better or worse than it really is. Give the overall certainty of this evidence. *[CO4 ; L5]*

(d) A senior colleague wants to start this protocol in your OPD next week. State what you would do instead, and give your reasons. *[CO4 ; L6]*

Q.4 A factory has 2,000 workers. At the start of the year, 160 workers had lumbar radiculopathy. During the year, 80 new cases appeared. A clinical test was compared with MRI in 200 workers with symptoms: **(6+5+5+4)**

	MRI positive	MRI negative
Test positive	72	24
Test negative	18	86

(a) Define prevalence, incidence and odds ratio. Calculate the point prevalence and the annual incidence for this factory. Show your working. *[CO3, CO4 ; L3]*

(b) From the table, calculate sensitivity, specificity, positive likelihood ratio and negative likelihood ratio. *[CO3, CO4 ; L4]*

(c) A worker has a pre-test probability of 30%. Calculate his post-test probability after a positive test and after a negative test. State whether this test is better for ruling in or ruling out the condition. *[CO3, CO4 ; L5]*

(d) The factory wants to replace clinical examination with a published clinical prediction rule. List the stages a prediction rule must pass before it can be used this way, and state whether you would accept the proposal. *[CO3, CO4 ; L6]*

Q.5 You are preparing your dissertation for publication. This sentence appears in your discussion:

> *"Our results prove that the technique is effective and should be the treatment of choice, although the difference was not significant (p = 0.07) and the sample was small."* **(6+5+5+4)**

(a) Describe the structure of a thesis and of an original research article. List the parts of a structured abstract. *[CO5, CO4 ; L2]*

(b) Find the mistakes in the sentence above. Name each type of error. *[CO5, CO4 ; L4]*

(c) Explain what a non-significant result in a small study can and cannot tell the reader. Rewrite the sentence in the correct form. *[CO5, CO4 ; L5]*

(d) Write the reporting and integrity plan for this manuscript trial registration, reporting guideline, authorship, conflict of interest, and plagiarism check. *[CO5, CO4 ; L6]*

MPT 103 **BCT**

MPT (Main/ Remanded) Examination Month /Year

Biomechanics & Therapeutics

Paper III

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A 48-year-old man walks with a limp. When he stands on his right leg, his trunk leans to the right and his left hip drops. He walks slowly and takes a shorter step with the left leg. **(6+5+5+4)**

(a) Describe the phases of the gait cycle. For each phase, name the main muscle groups that are working and state what they are doing. *[CO1 ; L2]*

(b) Explain the difference between kinematics and kinetics. Name the instruments used to measure each, and state what information each instrument gives. *[CO1 ; L4]*

(c) Analyse this patient's gait. Name the deviations you can identify, explain the mechanical reason for each, and state which muscle is most likely to be weak. *[CO1 ; L5]*

(d) Plan a gait-training programme for this patient. State how you will check whether the gait has actually changed. *[CO1 ; L6]*

Q.2 A 40-year-old woman has been in bed for four weeks after a long illness. She is now medically stable. She gets breathless and tired on walking a short distance, and she cannot get up from a low chair without using her hands. **(6+5+5+4)**

(a) Explain the principles of exercise training overload, specificity, progression, reversibility and individuality. Give one example of each in this patient. *[CO2 ; L2]*

(b) Explain how muscle responds to strength training and how it responds to endurance training. State the changes that take place in each case. *[CO2 ; L4]*

(c) Explain how you would decide the intensity, sets, repetitions, frequency and rest for her strengthening programme. Give your reasons. *[CO2 ; L5]*

(d) Design a six-week programme for her. State the objective measures you will use to show that she has improved. *[CO2 ; L6]*

Q.3 A 25-year-old man has a Grade II lateral ligament sprain of the ankle. He comes to you three weeks after the injury. There is no fracture. The ankle is still slightly swollen, movement is limited, and he cannot stand on that leg for long. **(6+5+5+4)**

(a) Describe the stages of soft-tissue healing. Give the approximate time period of each stage and the main event that takes place in it. *[CO2, CO3 ; L2]*

(b) Explain how mechanical loading affects a healing tissue. State what happens if the tissue is loaded too little, and what happens if it is loaded too much. *[CO2, CO3 ; L4]*

(c) Compare the basic idea behind any two of the following approaches, and state what each one looks for in a patient: Maitland, Kaltenborn, Cyriax, Mulligan, McKenzie. *[CO2, CO3 ; L5]*

(d) Plan the loading and manual therapy for this patient for the next four weeks. Justify your choice against the stage of healing. *[CO2, CO3 ; L6]*

Q.4 A 58-year-old woman has had pain in both knees for three years. There is no swelling and no redness. She has been referred to you for electrotherapy for pain relief. **(6+5+5+4)**

(a) Explain the physiological basis of pain relief by TENS. Describe the gate control theory and the endogenous opioid mechanism. *[CO5 ; L2]*

(b) Explain how you would select the parameters of the current frequency, pulse width, intensity, electrode placement and treatment time. State the difference between conventional TENS and acupuncture-like TENS. *[CO5 ; L4]*

(c) List the indications, contraindications and precautions for TENS and IFT. Explain why each contraindication exists. *[CO5 ; L5]*

(d) Choose one modality for this patient and write the complete dosage. State one modality you would not use here and give the reason. *[CO5 ; L6]*

Q.5 A 45-year-old man cannot lift his right foot while walking. There is weakness of ankle dorsiflexion and eversion, and numbness over the top of the foot. The nerve conduction study report is given below. **(6+5+5+4)**

Common peroneal nerve, motor study:

Conduction velocity below the fibular head = 52 m/s (normal)

Conduction velocity across the fibular head = 31 m/s

CMAP amplitude:

below the fibular head = 6.4 mV

above the fibular head = 3.0 mV

Needle EMG: a few fibrillation potentials in tibialis anterior; lumbar paraspinal muscles are normal.

(a) Describe the parts of an electrodiagnostic machine. Explain what latency, amplitude and conduction velocity each measures. *[CO4 ; L2]*

(b) Explain the strength–duration curve. State what the rheobase and the chronaxie mean, and how the curve differs between a normally innervated and a denervated muscle. *[CO4 ; L4]*

(c) Interpret the given report. Explain how you can tell demyelination from axonal loss, and state where the lesion is. Give the reason for each finding. *[CO4 ; L5]*

(d) State how these findings change your physiotherapy plan. Mention what you would avoid, and why. *[CO4 ; L6]*

MPT 104 (N) **NCPFD**

MPT (Main/ Remanded) Examination Month /Year

Clinical, Physical and Functional Diagnosis in Neuro-Physiotherapy

Paper IV

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A 58-year-old right-handed man is brought to the emergency department 90 minutes after suddenly becoming weak. He cannot speak fluently, but he understands what is said to him and is frustrated by his own speech. He has right sided facial weakness but he can wrinkle his forehead. The right arm is weaker than the right leg. The right plantar response is extensor, but the right limbs are flaccid and the deep tendon reflexes are absent. BP 178/96 mmHg. **(6+5+5+4)**

(a) Give the clinical features that distinguish an upper motor neurone lesion from a lower motor neurone lesion. List the components of the NIHSS. *[CO1, CO2, CO3; L2]*

(b) Localise the lesion. Use each clinical finding the type of speech problem, the forehead sparing, and the arm being weaker than the leg to justify your answer. *[CO1, CO2, CO3 ; L4]*

(c) The flaccidity and absent reflexes seem to contradict the extensor plantar response. Explain this apparent contradiction, and state which of the two signs you would trust.

[CO1, CO2, CO3 ; L5]

(d) State which imaging you would order in the first hour and why. Explain how the imaging result and not the weakness decides what physiotherapy you may give in the first 24 hours.

[CO1, CO2, CO3 ; L6]

Q.2 A 71-year-old man with Parkinson's disease has fallen twice in three months. Both falls happened while he was turning in the kitchen. He was assessed 90 minutes after taking his levodopa. **(6+5+5+4)**

Berg Balance Scale = 38/56; Mini-BESTest = 17/28 Timed Up-and-Go = 18 s; TUG while counting backwards = 26 s 10-metre walk speed = 0.72 m/s He sways more when standing on foam with his eyes closed. He reports freezing gait when turning in narrow spaces.

(a) Explain the systems that control standing balance. State how each system is tested.

[CO1, CO5 ; L2]

(b) Interpret each of his scores against its accepted cut-off value. State his fall risk.

[CO1, CO5 ; L4]

(c) Explain the meaning of the increase in his TUG time when he counts backwards. Explain why it matters that he was tested in the "on" state. State which of his problems the Berg Balance Scale cannot detect. *[CO1, CO5 ; L5]*

(d) Choose the outcome measures you would use to follow him for six months. For each, state the change that would be a real change and not measurement error, and give your reason.

[CO1, CO5 ; L6]

Q.3 A 34-year-old woman has had progressive weakness of both legs for 12 days. The weakness began in the feet and has moved up to the thighs. She has tingling in her hands and feet. She had a diarrhoeal illness three weeks ago. All reflexes are absent. There is no sensory level. Power is 3/5 at the hips and 4/5 at the ankles. Cranial nerves are normal. Her forced vital capacity is 1.6 litres (predicted 3.2 litres). **(6+5+5+4)**

> Nerve conduction study: conduction velocities reduced to 28–34 m/s in several nerves; prolonged distal latencies; conduction block and temporal dispersion in two nerves; F-waves absent or very prolonged. Repetitive nerve stimulation: no decrement. Needle EMG: reduced recruitment; no fibrillations.

(a) Describe the parts of an electrophysiological machine. State what nerve conduction studies, repetitive nerve stimulation, F-waves and needle EMG each measure. *[CO1, CO2, CO5 ; L2]*

(b) From the report, state whether the problem is demyelinating, axonal, at the neuromuscular junction, or in the muscle. Give the reason for each finding you use. *[CO1, CO2, CO5 ; L4]*

(c) Explain how these findings rule out myasthenia gravis, a myopathy and a spinal cord lesion. Give the diagnosis. *[CO1, CO2, CO5 ; L5]*

(d) One number in this case is more urgent than all the others. Name it, explain why, and state the monitoring you would insist on. State what physiotherapy you would avoid in the progressive stage, and why. *[CO1, CO2, CO5 ; L6]*

Q.4 A 14-month-old boy is brought with delayed milestones. He was born at 32 weeks, needed a ventilator for 5 days, and had a grade III intraventricular haemorrhage. He is not sitting on his own and does not crawl. On examination: increased tone in both legs, brisk reflexes, sustained ankle clonus, a persistent asymmetrical tonic neck reflex, absent sideways protective reaction of the arms, and scissoring of the legs when held up. He reaches with either hand and smiles socially. **(6+5+5+4)**

(a) Describe the components of a neurodevelopmental assessment. Explain the importance of primitive reflexes, righting reactions, protective reactions and equilibrium reactions, and give the age at which each appears or disappears. *[CO2, CO4, CO3 ; L2]*

(b) Calculate his corrected age. List the findings that are abnormal for that corrected age, and the findings that are within normal variation. *[CO2, CO4, CO3 ; L4]*

(c) Give the most likely diagnosis with your reasons. Classify the motor type and the distribution. Name two other conditions you would consider, and state how you would exclude each. *[CO2, CO4, CO3 ; L5]*

(d) Name the tools used for the early detection of cerebral palsy and state why early detection matters. State what you would tell the parents at this visit, and what you would not say.

[CO2, CO4, CO3 ; L6]

Q.5 A 28-year-old man is in the neuro-ICU, six days after a severe head injury (initial GCS 6; diffuse axonal injury on MRI). He is on a ventilator with minimal sedation (RASS −1). He has sudden episodes lasting about 20 minutes with heart rate 140/min, BP 180/100 mmHg, fast breathing, temperature 38.9 °C, heavy sweating and stiff, dystonic posturing. These episodes often start when he is turned or suctioned. His MRC sum score cannot be tested. His family asks whether he is in pain. **(6+5+5+4)**

(a) Describe the Glasgow Coma Scale, the FOUR score and the RASS. Describe how ICU-acquired weakness is assessed. *[CO1, CO4, CO5 ; L2]*

(b) Name the syndrome that these episodes represent. Explain its pathophysiology, and explain why turning and suctioning trigger it. *[CO1, CO4, CO5 ; L4]*

(c) Explain how you would distinguish this syndrome from sepsis, from a seizure and from pain. State how you would assess pain in a patient who cannot speak. *[CO1, CO4, CO5 ; L5]*

(d) Prepare an ICF-based assessment plan for him. State how these episodes would change the way you deliver physiotherapy, and state the two opposite mistakes you must avoid.

[CO1, CO4, CO5 ; L6]

MPT 2nd YEAR EXAMINATION: PAPER-SETTER INSTRUCTIONS

1	Set exactly 5 questions of 20 marks each (total 100, 3 hours). All compulsory. Every question must have 2 – 4 sub-parts whose marks add up to exactly 20.
2	Build every question on a real clinical, research, or ethics scenario; not a bare topic. The vignette must carry enough specific detail (setting, numbers, constraints) that a generic textbook answer cannot score.
3	Tag every sub-part with [CO ; Bloom's level]. No sub-part may go untagged. Ensure all Course Outcomes of the subject are covered across the paper, with none left out or over-used.
4	Keep the paper cognitively high. At least 60% of marks must sit at L4–L6 (Analyse / Evaluate / Create). L1 (Remember) stays under 10% and is never a standalone question; only a foundation part.
5	Design each question as a staircase; start lower and climb (typical: L2 → L4 → L5 → L6), exactly like the model ethics question.
6	The bloom's weightage: L1 - 5%; L2 - 10%; L3 - 15%; L4 - 25%; L5 - 25%; L6 - 20%
7	Reward reasoning, not volume. Give higher marks to parts needing more justification. Where the scenario allows an unsafe or unlawful "confident" answer, build that trap deliberately; such answers must not pass that sub-part.
8	Submit a model answer and component-wise marking scheme with every question, showing how each sub-part's marks are split and separating reasoning marks from recall marks.

Question Paper Structure:

Subject Code **Subject Abb.**

MPT (Main/ Remanded) Examination Month /Year

Subject Name

Paper I

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q1. Write Question Stem Here *[CO: ___ ;L:__]*

Q2. Write Question Stem Here *[CO: ___ ;L:__]*

Q3. Write Question Stem Here *[CO: ___ ;L:__]*

Q4. Write Question Stem Here *[CO: ___ ;L:__]*

Q5. Write Question Stem Here *[CO: ___ ;L:__]*

MPT 2nd YEAR

MPT 201 **EP**

MPT (Main/ Remanded) Examination Month /Year

Exercise Physiology

Paper I

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
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4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A 24-year-old middle-distance runner trains for an 800-metre event. During a hard interval session his coach notices he tires quickly in the last 200 metres. **(6+5+5+4)**

(a) Describe the three energy systems and the type of exercise each one mainly supplies.

[CO1;L2]

(b) Analyse how the body shifts from one energy system to another as the 800-metre run proceeds, and explain which system limits his last 200 metres. *[CO1; L4]*

(c) Explain how exercise intensity and duration decide whether he burns mostly carbohydrate or mostly fat, and why protecting his carbohydrate stores matters in this event. *[CO1; L5]*

(d) Design an interval-training change that would improve his performance in the final 200 metres. Justify it using the energy systems. *[CO1; L6]*

Q.2 A sports nutritionist and you are planning the pre-competition diet of a 20-year-old marathon runner. She weighs 55 kg and complains of fatigue in the second half of her long runs. **(6+5+5+4)**

(a) Define BMR and RMR, and describe the factors that affect them. State what a MET is and how it is used to measure the energy cost of exercise. *[CO2, CO3; L2]*

(b) Analyse the role of carbohydrate, fat, protein and water in her performance, and explain what happens to her body fluids and performance if she becomes dehydrated during the run.*[CO3; L4]*

(c) Evaluate the practice of carbohydrate loading for this runner, what it is, how it is done, and its benefits and limits. *[CO4; L5]*

(d) Design her pre-game meal and her fluid-and-energy replacement plan for a long run. Justify each choice. *[CO4; L6]*

Q.3 A 30-year-old recreational cyclist wants to improve his endurance. He asks you why his heart rate and breathing settle down after a few weeks of the same training. **(6+5+5+4)**

(a) Describe the normal cardiovascular and respiratory responses to a single bout of aerobic exercise. *[CO5; L2]*

(b) Analyse the way blood flow is redistributed during exercise, and explain the central and peripheral mechanisms that regulate the cardiovascular system during a hard ride. *[CO5; L4]*

(c) Explain the concept of the anaerobic threshold and VO_2max, and evaluate how each one limits or predicts his endurance performance. *[CO5; L5]*

(d) List the long-term cardiovascular and respiratory adaptations he will develop, and explain how these adaptations produce the lower resting heart rate and easier breathing he has noticed.

[CO5; L6]

Q.4 A footballer plays a full match on a hot, humid afternoon. Near the end he becomes confused, stops sweating and collapses. **(6+5+5+4)**

(a) Describe how the body regulates its temperature during exercise, and the ways it loses heat.

[CO5; L2]

(b) Analyse the stages of heat illness, heat cramps, heat exhaustion and heat stroke and use the features in this case to decide which one he has. *[CO5; L4]*

(c) Evaluate how acclimatisation, age and hydration change an athlete's ability to exercise safely in the heat. *[CO5; L5]*

(d) Design a heat-illness prevention plan for this team for the rest of the tournament. Justify each part. *[CO4, CO5; L6]*

Q.5 A 45-year-old man with type 2 diabetes on oral medication wants to start an exercise programme to control his blood sugar and lose weight. He is overweight with fat mainly around the abdomen. **(6+5+5+4)**

(a) Describe the hormonal responses to exercise, focusing on insulin, glucagon and the catecholamines. *[CO7; L2]*

(b) Analyse how regular exercise improves glucose tolerance and insulin sensitivity, and explain the link between his abdominal fat, energy balance and the metabolic syndrome.*[CO6, CO7; L4]*

(c) Evaluate the risks of exercise in a person with diabetes and how you would reduce them. Explain the role of acid–base balance after his heavy exercise sessions. *[CO6, CO7; L5]*

(d) Design a combined exercise-and-diet programme for healthy weight loss and better glucose control for this man. Justify your choices. *[CO4, CO7; L6]*

MPT (N) 202 **NPT**

MPT (Main/ Remanded) Examination Month /Year

Neurological Physiotherapy

Paper II

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
3. Any question having parts must be answered as a whole at one place only.
4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A 55-year-old man has a left-sided weakness three weeks after a stroke. He has increased tone in the arm, some return of movement, and difficulty walking. **(6+5+5+4)**

(a) Describe the ICF framework and how it is used to plan the management of a neurological patient. *[CO4; L2]*

(b) Analyse this patient's problems at the levels of body structure, activity and participation.

[CO2; L4]

(c) Evaluate the main treatment approaches for central motor control problems and decide which suits this patient. *[CO1, CO2; L5]*

(d) Design a stage-wise physiotherapy plan to improve his walking. Justify each part.

[CO1, CO4; L6]

Q.2 A 30-year-old woman has increased tone and stiffness in both legs after a spinal cord problem. Her spasticity interferes with sitting and transfers. **(6+5+5+4)**

(a) Describe the neurophysiological basis of tonal abnormalities and how spasticity is assessed.

[CO4; L2]

(b) Analyse how her spasticity affects her sitting, transfers and daily function. *[CO2; L4]*

(c) Evaluate the physiotherapy techniques and adjuncts used to manage spasticity, and their evidence. *[CO2, CO4; L5]*

(d) Design a spasticity-management plan for her, and state when you would refer her for medical or surgical help. *[CO1, CO3; L6]*

Q.3 A 45-year-old man has weakness and wasting of the small muscles of the hand and foot drop after a peripheral nerve injury. **(6+5+5+4)**

(a) Describe the physiotherapy assessment of a peripheral nerve injury and the signs of denervation and reinnervation. *[CO2; L2]*

(b) Analyse how you would decide which muscles to strengthen and which to protect during recovery. *[CO2, CO4; L4]*

(c) Evaluate the role of electrical stimulation, splinting and neural mobilisation in the recovery of a peripheral nerve injury. *[CO2, CO4; L5]*

(d) Design a rehabilitation programme for him, avoiding overwork weakness. State your precautions. *[CO1, CO2; L6]*

Q.4 A 62-year-old man with Parkinson's disease has slow movement, poor balance and freezing of gait. His family wants to know how physiotherapy can help. **(6+5+5+4)**

(a) Describe the physiotherapy approaches used for degenerative and central motor control disorders. *[CO4; L2]*

(b) Analyse how his slowness, balance loss and freezing each limit his daily activities.

[CO2; L4]

(c) Evaluate the use of cueing, treadmill training and task-oriented practice for a patient with Parkinson's disease. *[CO2, CO4; L5]*

(d) Design a physiotherapy programme to improve his walking, balance and safety at home. Justify each part. *[CO1, CO4; L6]*

Q.5 A 25-year-old man is in intensive care after a severe head injury. He is now medically stable but immobile, and the team asks for physiotherapy. **(6+5+5+4)**

(a) Describe the aims and methods of neuro-physiotherapy in the intensive care unit. *[CO2; L2]*

(b) Analyse the risks of prolonged immobility in this patient and how physiotherapy prevents them. *[CO2; L4]*

(c) Evaluate the role of FES, biofeedback and other equipment used in neuro-physiotherapy for such patients. *[CO2, CO4; L5]*

(d) Design an ICU-to-ward physiotherapy plan for him, including how you would manage his bladder, bowel and positioning needs. *[CO1, CO3; L6]*

MPT (N) 203 **NRAEB**

MPT (Main/ Remanded) Examination Month /Year

Recent Advances and Evidence Based Practice in Neuro-Physiotherapy

Paper III

Time: 3 hrs **Maximum Marks: 100**

General Instructions

1. All five questions are compulsory. Each question carries 20 marks.
2. Every question has sub-parts; marks for each sub-part are indicated.
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4. The student shall be allowed only one supplementary copy along with one main answer book.
5. Answers must demonstrate reasoning and justification. Marks are not awarded for volume or restatement of the stem.
6. A recommendation that would be unsafe or unlawful for the person described shall not receive a pass mark on that sub-part.

LONG ANSWER QUESTIONS **5 x 20**

Q.1 A 55-year-old man six months after a stroke still has a weak, poorly controlled arm. His family has read about new therapies like virtual reality and robotic training and asks whether they would help. **(6+5+5+4)**

(a) Describe the recent neuro-physiotherapy techniques for the upper limb virtual reality, robotic therapy, mirror therapy and mental imagery. *[CO1; L2]*

(b) Analyse how you would search for and judge the current evidence on these techniques for stroke recovery. *[CO2; L4]*

(c) Evaluate the evidence for virtual reality and robotic training compared with conventional therapy for the stroke-affected arm. *[CO2, CO3; L5]*

(d) Recommend an evidence-based upper-limb programme for this patient, and justify why you chose it. *[CO3; L6]*

Q.2 A 60-year-old woman with Parkinson's disease has been referred, and her clinic wants an evidence-based physiotherapy protocol rather than routine exercises. **(6+5+5+4)**

(a) Describe the recent advances and evidence-based approaches in the physiotherapy management of Parkinson's disease. *[CO1; L2]*

(b) Analyse how you would use current evidence to select cueing, treadmill and task-oriented training for her. *[CO2, CO3; L4]*

(c) Evaluate the evidence for these approaches in improving gait and balance in Parkinson's disease. *[CO2, CO3; L5]*

(d) Formulate an evidence-based physiotherapy protocol for the clinic. Justify the outcome measures you include. *[CO3; L6]*

Q.3 A young man with a spinal-cord-level peripheral nerve injury lives far from the hospital and cannot attend regularly. The team is considering tele-rehabilitation. **(6+5+5+4)**

(a) Describe tele-rehabilitation in neurological physiotherapy and the evidence for its use.

[CO1; L2]

(b) Analyse the barriers and challenges to using evidence-based practice and tele-rehabilitation in this patient's situation. *[CO2; L4]*

(c) Evaluate the evidence for physiotherapy management of peripheral nerve injuries delivered remotely versus in person. *[CO2, CO3; L5]*

(d) Design a tele-rehabilitation programme for him, and justify how you would keep it safe and effective. *[CO3; L6]*

Q.4 A rehabilitation centre wants to introduce advanced brain-stimulation and technology-based therapies and asks whether the evidence supports them. **(6+5+5+4)**

(a) Describe transcranial direct current stimulation, transcranial magnetic stimulation and other recent technology-based neuro-therapies. *[CO1; L2]*

(b) Analyse how you would appraise the evidence for a new brain-stimulation technique before using it on patients. *[CO2; L4]*

(c) Evaluate the current evidence and safety of these advanced therapies in neurological rehabilitation. *[CO2, CO3; L5]*

(d) Recommend which technologies the centre should adopt, and defend your recommendation using the evidence. *[CO3; L6]*

Q.5 A patient with cerebellar ataxia has poor balance and coordination. The team asks for an evidence-based management and long-term rehabilitation plan. **(6+5+5+4)**

(a) Describe the recent advances in the physiotherapy management of cerebellar ataxia, and the role of vocational and community-based rehabilitation. *[CO1; L2]*

(b) Analyse how you would use current evidence to plan balance and coordination training for this patient. *[CO2, CO3; L4]*

(c) Evaluate the evidence for balance and coordination training and for assistive technology in cerebellar ataxia. *[CO2, CO3; L5]*

(d) Design an evidence-based short- and long-term rehabilitation plan for him, including community reintegration. Justify each part. *[CO3; L6]*

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