



## SRU COLLEGE OF PARAMEDICAL TECHNOLOGY SunRise University Campus, Alwar, Rajasthan, India

### SYLLABUS

#### MASTER OF PHYSIOTHERAPY

#### MPT ., [PHYSIOTHERAPY IN NEURO] / M.Sc.,PT IN NEURO

##### PROGRAM TITLE

Master of Physiotherapy (MPT)  
Physiotherapy in NEURO.

##### COURSE OUTLINE

The Master Degree in Physiotherapy is a two-year program consisting of classroom teaching, self-academic activities and clinical posting. In the first year, theoretical basis of specialty physiotherapy is refreshed along with research methodology and biostatistics. The students are posted in their areas of clinical expertise specialty during this period. They are required to choose their study for dissertation and submit a synopsis. During the second year the students will be posted in their area of specialty. They are required to complete and submit their dissertation. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference, workshop to enhance their knowledge during the course of study. University examinations are held at the end of second year.

##### GOALS OF COURSE

Preparation of a post graduate student towards his/ her professional autonomy with self-regulating discipline at par with global standards. 2. Formation of base of the professional practice by referral as well as first contact mode using evidence-based practice. 3. Impartation of research basis in order to validate techniques & technology in practice to physiotherapy. 4. Acquainting a student with concept of quality care at the institutional as well as the community levels. 5. Inculcation of appropriate professional relationship in multidisciplinary set up, patient management and co partnership basis. 6. Preparation of students to address problems related to health education and community physiotherapy. 7. Practicing the concept of protection of rights of the community during referral as well as first contact practice. 8. Incorporation of concept of management in physiotherapy. 9. Experience in clinical training and undergraduate teaching partly. 10. Providing the honest, competent and accountable physiotherapy services to the community.

##### ELIGIBILITY

Eligibility to offer Master Degree Program in Physiotherapy (MPT)

Eligibility for Admission Candidates who have passed B.Sc. (PT) or BPT degree from institutions where the mode of study is a full time program, with minimum 3½ years / 4 ½ years duration from this university or any other university in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy Colleges recognized by UGC approved University are eligible.

Candidates who have passed BPT through correspondence or Distance Education program are not eligible.

OR

Candidates who have passed BPT through Bridge Course or through Lateral Entry after completing their Diploma in Physiotherapy from institutions where the mode of study is a full time program from this university

or any other university in India or abroad as equivalent with not less than 50% of marks in aggregate and have completed 6 months of compulsory rotating internship in Physiotherapy Colleges recognized are eligible. Candidates who have passed BPT through correspondence or Distance Education program are not eligible. Obtaining Eligibility Certificate .

No candidate shall be admitted for the postgraduate degree course unless the candidate has obtained and produced the eligibility certificate issued by the University . The candidate has to make the application to the university with the following documents along with the prescribed fee.

1. B.P.T. or B.Sc. (PT) provisional / degree certificate issued by the respective university.
2. Marks cards of all the university examinations passed.
3. Completion of internship certificate.
4. Proof of SC/ST or category-I as the case maybe. Candidate should obtain the eligibility certificate before the last date for admission as notified by the university.

A candidate who has been admitted to postgraduate course should register his/her name in the University within a month of admission after paying the registration fee.

#### DURATION OF THE COURSE

The duration of master of physiotherapy course shall be extended over a period of two continuous Years' on a full-time basis. Any break in the career, power of extension of the course and the fixation of the term shall be vested with the University.

#### MEDIUM OF INSTRUCTION

English will be the medium of instruction for the subjects of study and for the examination of the MPT course.

#### INTAKE

The intake of students to the course shall be in accordance with the ordinance in this behalf. The guide student ration should be 1:3 Intake to the Course: (a) An Institution while starting MPT for the first time, the fresh intake to the Master Degree Program in Physiotherapy (MPT) shall not exceed THREE students/ specialty. (b) The University may increase the intake subject to availability of Post Graduate guides and the Institution/College may apply for increase in intake, only after the first batch of students have successfully completed the above course. (c) The Post Graduate intake in the Institution/ College shall not exceed SIX seats/ specialty. (d) Existing institutions affiliated to RGUHS offering MPT, may continue their admission with their existing total intake capacity as approved by RGUHS and Government of Karnataka order. (e) Existing institutions affiliated to RGUHS offering MPT must decide the number of seats they would like to opt for in each specialty and offer them based on the availability of recognized guide for a particular specialty infrastructure and facilities available. However, The Post Graduate intake in the Institution/ College affiliated to RGUHS offering MPT shall not exceed SIX seats/ specialty. (f) Whereas, the University may increase the intake subject to availability of Post Graduate guides and the Institution/ College may apply for increase in intake in existing institutions affiliated to RGUHS offering MPT for not more than SIX seats/ specialty.

b) However, the intake for fresh commencement in new colleges for the first time shall be THREE per specialty. c) The allotment of seats for any specialty shall be subject to availability of recognized guides by RGUHS in the area of specialty chosen. d) A new institution imparting a Master's degree in Physiotherapy can apply for seat enhancement only after the first batch of Master in Physiotherapy students have passed. No increase of intake shall exceed THREE seats per year and per specialty at a time.

#### GUIDE

Post Graduate Guide: (a) The teacher in a Physiotherapy College having 5 years of full-time teaching experience after obtaining Master Degree Program in Physiotherapy (MPT) and the teacher has been recognized as guide by the University.

(b) Every recognized Post Graduate teacher can guide THREE students/year (c) Whereas, the existing MPT postgraduate guides in institutions affiliated to RGUHS may reapply for their recognition to guide specialty of their choice as per the specialty available in accordance to this ordinance. (d) This ordinance proposes to introduce a total of 7 specialties. This creates a need for guides in 2 additional areas in addition to the existing elective branches. A onetime measure is provided to PG guides to select the specialty branch they would guide. Once selected, the individual will be recognized as a guide for the specialty at University.

The academic qualification and teaching experience required for recognition by this university is as per the criteria for recognition of MPT teachers for guides. Criteria for recognition of MPT teacher / guide 1. M.Sc. (PT) /MPT with five years teaching experience working on a full-time position at a Recognized institution. 2. The age of guide / teacher shall not exceed 63years. 3. The guide student ratio should be 1:3 Change of Guide In the event of registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

## COURSE CONTENT & STRUCTURE

The course and structure are outlined under Subjects of Specialty as follows

SPECIALTY	Teaching & Learning Methods	Weekly Class Hours	Total Hours
a) Principles of Physiotherapy Practice b) Research Methodology and Biostatistics c) Exercise Physiology d) Electrophysiology e) Applied Anatomy, Applied Physiology and Biomechanics in the area of specialty f) Physical and Functional Diagnosis relevant to specialty g) Treatment planning and Physiotherapy Management h) Recent Advances in the area specialty	Lectures	3	180
	Seminars	3	180
	Practical and Demonstrations	5	360
	Discussions	3	180
	Case presentations Journal	3	180
	Teaching / Pedagogy	3	180
Synopsis & Dissertation work	Training	3	210
Field Visits, Participation in Workshops & Conference			60

### ATTENDANCE:

A candidate is required to attend a minimum of 80% of training and of the total classes conducted during each academic year of the MPT course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% of training period every year. Any student who fails to complete the course in this manner shall not be permitted to appear the University Examinations. A candidate who does not satisfy the requirement of attendance even in one subject or more will not be permitted to appear for University Examination. He / She will be required to make up the deficit in attendance to become eligible to take subsequent examination.

### METHOD OF TRAINING:

The training of postgraduate for MPT degree shall be on a full-time pattern with graded responsibilities in the management and treatment of patients entrusted to his / her care. The participation of all the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, clinical rounds, care demonstrations, clinics, journal review meetings & Continuing Professional Education. Every candidate should be required to participate in the teaching and training programs of undergraduate students. Training should include involvement in laboratory experimental work and research studies. Clinical Facility: Every Institution/College shall have provision for clinical facility for the specialties offered. This must be available in your own hospital or affiliated hospital. Clinical Department required in the Hospital. Every Institution/College shall have provision for clinical facility as specified in Schedule III of the BPT Ordinance

2016 The minimum number of beds required for Master degree program is 150. They may be distributed for the purposes of clinical teaching as specified in Schedule III of the BPT Ordinance 2016. OPD – in campus requirement Minimum number of outpatient flow shall be 20 per day in the College campus. This is in addition to the OPD at the attached hospital of the college. OPD Unit: Mandatory 2000 sq. ft (minimum) to accommodate exercise and electro therapy units and make provision for mat area and a consultation room. An outpatient department at the tie up facility cannot be considered as an independent OPD Unit of the college. Staff Room of 200 Sq. ft. to be provided for staff in OPD unit. Laboratories: (a) Every Institution/College running Master Degree Program in Physiotherapy (MPT) shall have adequate laboratory facilities as specified in the ordinance for Bachelor of Physiotherapy, BPT (b) The standard of such laboratory, space, equipment, supplies, and other facilities shall be in consonance with the ordinance for BPT i. Biomechanics / (Research Lab) ii. Electro therapy Lab iii. Exercise therapy Lab Each lab shall have a minimum area of 800 sq. ft comprising of 5 treatment tables. The Physiotherapy Labs must have the necessary equipment as prescribed the BPT Ordinance Practical: (a) The students shall carry out the practical learning under the guidance and supervision of a recognized guide. (b) Every batch for practical learning shall consist of not more than SIX students. (c) e – Learning shall be part and parcel of the Master Degree Program in Physiotherapy (MPT). Laboratories: (a) Every Institution/College running Bachelor Degree Program in Physiotherapy shall have adequate laboratory facilities specified in Schedule IV of the BPT Ordinance. (b) The standard of such laboratory, space, equipment, supplies, and other facilities shall be in consonance with Schedule IV of the BPT Ordinance. MPT course – Mandatory additional clinical section/ equipment/ Lab requirement. The detailed list is provided in the curriculum under each Specialty area and the same is a part of this ordinance (a) MPT –MSK i. Affiliation with a hospital having Orthopedic department must be established if offering this elective ii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty. (b) MPT –Sports i. Affiliation with a Sports facility must be established if offering this elective. ii. A working MOU for utilizing the Lab facilities at the Affiliated Sports facility will be acceptable. iii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty. iv. (c) MPT –CVP i. Affiliation with a hospital having General Medicine, General Surgery, Pulmonary and Cardiac department, Medical and surgical ICU, Burns and Plastic surgery department must be established if offering this specialty. ii. The center MUST have the equipment and facilities mentioned in the curriculum for this specialty.

#### MONITORING PROCESS OF STUDENTS (INTERNAL MONITORING)

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model checklist are given in the table 1 to 7 (APPENDIX) which may be copied and used Portfolio: Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars etc. Special mention may be made of the presentations by the candidate as well as details of clinical of laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution and presented in the university examination. Periodic tests: The College may conduct periodic tests. The test may include written theory papers, practical, viva voce and clinical in the pattern of university examination. Records and marks obtained in such tests will be maintained by the Head of Department and sent to the University, when called for.

#### DISSERTATION

Every candidate pursuing MPT degree course is required to carry out work on a selected research Project under the guidance of a recognized postgraduate teacher. This may include qualitative research, systematic review or empirical research. The results of such a work shall be submitted in the form of dissertation. 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 of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions. Every candidate shall submit to the Registrar of university in the prescribed proforma a synopsis containing particulars of proposed dissertation work within 6 months from the date of commencement of the course on or before the dates notified by the university. The synopsis shall be sent through the proper channel. Such synopsis will be reviewed and the university will register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the university. Guide will be only a facilitator, advisor of the concept and hold responsible in correctly directing the candidate in the methodology and not responsible for the outcome and results. The written text of dissertation shall not be less than 50 pages and shall not exceed 200

pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27"x 11.69") and bound properly. Spiral binding should be avoided. The guide, head of the department and head of the institution shall certify the dissertation. Dissertation thus prepared shall be submitted to the Registrar (Evaluation) as per the format notified by the University, three months before final examination on or before the dates notified by the university. The examiners appointed by the university shall value the dissertation. Approval of dissertation work is an essential precondition for a candidate to appear in the university examination. The dissertation shall be valued by the evaluator (Examiners) apart from the guide out of which one is external outside the university and one internal from other college of the same university. Any one-evaluator acceptance other than the guide will be considered as a precondition for eligibility to take the examination. Dissertation once defended need not be defended at successive examination attempts.

#### SCHEDULE OF EXAMINATION

The University shall conduct examination for MPT course at the end of 2nd year. The Examinations shall be known as MPT Final Examination. A student shall register for all the papers when he/she appears for the first time. If a student fails in theory and/or practical of MPT Final Examination, he/she has to reappear for all the papers of examination in both theory and practical respectively.

#### PAPER I IS COMMON FOR ALL THE SPECIALTIES

A written examination consisting of 4 question papers each of three hours duration & each paper carrying 100 marks. Particulars of Theory question paper & distribution of marks are shown here in this syllabus.

#### PARTICULARS OF PRACTICAL AND VIVA-VOCE

Examination will be aimed at examination of clinical skills and competence of the candidates for undertaking independent work as a specialist.

#### PARTICULARS OF VIVA VOCE

Viva- Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence & oral communication skills and spotters. Special emphasis shall be given to dissertation work during the MPT Part examination. (The Student need not defend their dissertation at successive attempts). The marks of Viva-Voce examination shall be included in the clinical examination to calculate the percentage and declaration of results.

#### EXAMINERS

Practical- I - There shall be 2 examiners. One of them shall be external outside the zone from the same specialty and the other shall be internal from the same specialty from the same college. Practical - II - There shall be 2 examiners. One of them shall be external outside the University from the same specialty and the other will be guide assigned to the student from the same college.

#### CRITERIA FOR DECLARING PASS IN THE UNIVERSITY EXAMINATION

A candidate shall be declared pass if he / she secures a 50% of marks in theory aggregate and secures a 50% of marks in Practical / Clinical and Viva-Voce aggregate. **DECLARATION OF CLASS** First class with distinction - 75% & above in aggregate provided the candidate passes the examination in 1st attempt. First class - 60% & above in aggregate provided the candidate pass the examination in 1st attempt. Pass - 50% of maximum marks in theory aggregate and 50% of maximum marks in clinical and Viva-Voce aggregate.

#### DESCRIPTIVE COURSE CONTENT

##### Paper I

Fundamentals in Physiotherapy , Pedagogy and Research

Principles of Physiotherapy

Definition of Physiotherapy, Scope of Practice

b. General and Professional competencies

c. Physiotherapy Knowledge, Skill and Education Framework

d. Principles of Evidence Based Practice in Physiotherapy

a. History taking, assessment tests, Patient Communication, documentation of findings, treatment planning and organization.

b. Documentation of rehabilitation assessment and management using International Classification of Functioning Disability and Health (ICF).

c. Use of Standardized scales and tests in various assessments. Psychometric properties and its Interpretation in Physiotherapy practice.

2. Core Professional Values in Physiotherapy including Professional and Research Ethics

- a. Introduction to World Physiotherapy Standards of Physical Therapy Practice Guideline
- b. Core Professional Values across Different Countries and Regions
- c. ICMR Ethical Guidelines
- d. Ethical issues in practice of physiotherapy.
3. Research Methodology and Biostatistics
  - a. Designing Clinical Research: Basic Ingredients
    - i. Getting Started:  
The Anatomy and Physiology of Clinical Research
    - ii. Fundamentals of Literature Search and Review
    - iii. Conceiving the Research Question and Developing the Study Plan
    - iv. Choosing the Study Subjects: Specification, Sampling, and Recruitment
    - v. Planning the Measurements: Precision, Accuracy, and Validity
    - vi. Hypotheses and Underlying Principles to Estimating Sample Size and Power
  - b. Designing Clinical Research: Study Designs
    - i. Designing Cross-Sectional, Case–Control and Cohort Studies
    - ii. Enhancing Causal Inference in Observational Studies
    - iii. Designing a Randomized Blinded Trial, Alternative Clinical Trial Designs and their Implementation Issues
    - iv. Designing Studies of Diagnostic Tests
    - v. Research Using Existing Data
    - vi. Fundamentals of Qualitative Research Methods
    - vii. Fundamentals of Systematic Reviews and Metaanalysis
    - viii. Designing a systematic review protocol
  - c. Implementation of Clinical Research
    - i. Designing Questionnaires, Interviews, and Online Surveys
    - ii. Implementing the Study and Quality Control
    - iii. Data Management
    - iv. Designing qualitative studies
  - d. Biostatistics
    - i. Basic Fundamentals of Biostatistics
    - ii. Probability and Normal Distribution
    - iii. Descriptive Statistics: Measures of Central Tendency and Spread
    - iv. Hypothesis Testing: One-Sample Inference, Two-Sample Inference, Multi-sample Inference,
    - v. Hypothesis Testing: Nonparametric Methods, Categorical Data
    - vi. Regression, Correlation Methods and Diagnostic Tests
    - vii. Data synthesis in qualitative design
  - e. Consuming and Disseminating Research
    - i. Strategies for following Emerging Evidence, Clinical Practice Guidelines and Clinical pathways
    - ii. Best Practices in Research Dissemination
    - iii. Writing a Manuscript for Publication
4. Exercise Physiology
  - a. Fundamentals of Human Energy Transfer
  - b. Source of Nutrition and Energy, Macro and Micro Nutrients, Food Energy and Optimum Nutrition for Exercise
  - c. Energy Expenditure During Rest and Physical Activity
  - d. Measuring and Evaluating Human Energy-Generating Capacities During Rest and Exercise
  - e. Responses and Adaptations of Pulmonary, Cardiovascular, Neuromuscular, Musculoskeletal, Endocrine System to Different Types of Exercise and Training
  - f. Body Composition, Its Evaluation, Obesity and Weight Control
  - g. Training the Anaerobic and Aerobic Energy Systems
  - h. Training Muscles to Become Stronger
  - i. Factors Affecting Physiological Function: The Environment and
  - Special Aids to Performance
  - j. Influence of Age and Gender in Exercise and Training.

5. Electrophysiology

- a. Anatomy and physiology of peripheral nerve, muscle and neuromuscular junction.
- b. Electrical properties of muscle and nerve.
- c. Instrumentation for neuromuscular electrical stimulation.
- d. Muscles plasticity in response to electrical stimulation.
- e. Electrical stimulation and its effects on various systems.

6. Pedagogy in Physiotherapy Education

- a. Competency Based Education in Physiotherapy
- b. Basics of Adult Learning Theories including Learning Styles and Motivation
- c. Formulating Intended Learning Outcomes Including Tyler's principles, Bloom's Taxonomy, Miller's Pyramid, Clinical Competence, and Dreyfus' Model of Skill Acquisition
- d. Instructional Design and Individual Assessment such as Multiple-choice Question Writing, Skill assessment, Oral Presentation, and Rubrics and Standardization
- e. Instructional Techniques: Knowledge Transfer
- f. Instructional Techniques: Skill Development
- g. Instructional Techniques: Attitudes
- h. Instructional Techniques: Teaching with Technology
- i. Academic Planning and Organisation

7. Management, Entrepreneurship and Leadership in Physiotherapy Practice

- a. Introduction to Management in Physiotherapy: Definition, Principles, Functions and Evolution of Management Thought
- b. Management Process: Planning, Organizing, Directing, Controlling. Decision making.
- c. Responsibilities of the Physiotherapy Manager: Staffing Responsibilities; Responsibility for Patient Care; Fiscal Responsibilities; Responsibility for Risk Management; Legal and Ethical Responsibilities; Communication Responsibilities
- d. Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers
- e. Leadership: Need, Relevance, Competencies and Characteristics

References

1. World Physiotherapy (2019) Description of Physical Therapy: Policy Statement. Available from

World Physiotherapy (2011) Physical Therapist Professional Entry Level Education Guideline. (Available from: <https://world.physio/sites/default/files/2020-07/G-2011-Entrylevel-education.pdf>)

3. CSP (2011)

Physiotherapy Framework: Putting physiotherapy Behaviours, Values, Knowledge & Skills into Practice [updated May 2020](Available from: <https://www.csp.org.uk/professionalclinical/cpd-education/professional-development/professionalframeworks>) 4. Expected Minimum Competencies for an Entry Level Physiotherapist in the Europe Region World Physiotherapy Guidance Document (Available from: [https://www.erwcpt.eu/education/expected\\_minimum\\_competencies\\_for\\_entry\\_level](https://www.erwcpt.eu/education/expected_minimum_competencies_for_entry_level)) 5. Evidence-Based Medicine: How to Practice and Teach EBM, 2nd Edition: By David L. Sackett, Sharon E. Straus, W. Scott Richardson, William Rosenberg, and R. Brian Haynes, Churchill Livingstone, 2000 6. Rob Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead. Practical Evidence-Based Physiotherapy (Second Edition), Churchill Livingstone, 7. 2011, ISBN 9780702042706, 8. World Physiotherapy (2011) Standards of Physical Therapy Practice Guideline(Available from: <https://world.physio/sites/default/files/2020-06/G-2011-Standards-practice.pdf>) 9. 2017 ICMR National Ethical Guidelines for Biomedical and Health Research involving Human Participant 10.2020 ICMR Policy on Research Integrity and Publication Ethics (RIPE) 11.Designing Clinical Research 4th Edition. Stephen B. Hulley et al. Published By: Lippincott Williams & Wilkins. ISBN-13: 9781469840543 12.Medical Biostatistics (Chapman & Hall/CRC Biostatistics Series). 4th Edition 2017. Abhaya Indrayan, Rajeev Kumar Malhotra. Chapman and Hall/CRC. ISBN 9781498799539 13.Exercise Physiology Nutrition, Energy, and Human Performance. 8th Edition. William D. McArdle PhD, Frank I. Katch , Victor L. Katch. Lippincott Williams & Wilkins. ISBN/ISSN: 9781451191554 14.Principles of Medical Education. 4th Edition. Tejinder Singh, Piyush Gupta, Daljit Singh. 2013. Jaypee Publishers. 15.Management in Physical Therapy Practices, 2nd Edition. Catherine G. Page PT, MPH, PhD. ISBN-13: 978-0-8036-4033-7 16.Heather A. Current thinking on Leadership and Physiotherapy Practice. 2016. Report Prepared for AGILE Professional Network of the Chartered Society of Physiotherapy (Available from: [https://agile.csp.org.uk/system/files/current\\_leadership\\_thinking\\_and\\_physiotherapy\\_practice.pdf](https://agile.csp.org.uk/system/files/current_leadership_thinking_and_physiotherapy_practice.pdf))

Master of Physiotherapy Neurological Science MPT-Neuro /M.Sc.,(PT IN NEURO)

**OBJECTIVES:**

On Completion of the course, the post graduate will be able to 1. Exercise professional autonomy based on sound knowledge, skills and discipline at par with global standards in prevention, management and rehabilitation of patients with neuro-medical and neuro-surgical conditions 2. Practice within the professional code of ethics and conduct, and the standards of practice within legal boundaries. 3. Identify and analyse specific risks and dysfunction related to neurological conditions within the boundaries of physiotherapy practice and arrive at an appropriate hypothesis based on sound clinical reasoning 4. Work with integrity and autonomy in an interdisciplinary team 5. Involve in undergraduate and postgraduate teaching with competence 6. Conduct research activities and utilize findings for professional development and lifelong learning.

**SCOPE:**

A Neuroscience specialised physiotherapist will be competent to evaluate, assess and arrive at reasoning-based hypothesis in patients with neuro-medical or neuro-surgical trauma or disease. Neurology Physiotherapists work based on the ICF framework to develop, maintain, restore and optimize health and function. They will be competent to use current evidence to treat and manage Neurological dysfunctions in children, adults and elders. They will be competent to act as a team leader of a multidisciplinary rehabilitation team and contribute to interdisciplinary care planning and implementation of Neurorehabilitation methods. They will be competent to take up academic and research positions in their area of expertise. They are competent to be autonomous clinical practitioners.

**PAPER II**

**BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY I,II,III,IV**

1. Anatomy and Physiology of nervous system a. Central nervous system, b. Peripheral nervous system and c. Autonomic Nervous system 2. Pathology and clinical features of nervous system disorders a. Pathological changes and clinical features in progressive and nonprogressive disorders of Central and peripheral nervous system causing movement dysfunction. 3. Motor

control a. Physiology of Motor control [Movement organization at a cortical level, contributory role of cerebellum, basal ganglia and other subcortical structures] b. Theories of Motor Control [Reflex Theory, Hierarchical Theory, Systems Theory, Dynamical systems theory, Equilibrium point theory, Ecological Theory, Uncontrolled Manifold Theory] c. Kinematic and Kinetic Motor Control variables

4. Motor Development a. Motor development [Reflex, Gross Motor, Fine Motor] b. Sensory development c. Cognitive development d. Social development

5. Motor behavior of basic tasks [Walking, Postural control and Object interaction with hands] a. Goal and description of motor tasks b. Development and variation of motor tasks across different age groups c. Neural control of motor tasks d. Biomechanics of motor tasks e. Role of environment variables in task performance across different stages of development

6. Motor learning and principles of promoting neuroplasticity a. Physiology of Motor learning b. Stages of Learning c. Classification of Motor Tasks d. Practice and feedback for motor tasks e. Measurement of Motor Learning

7. Exercise promotion and disease prevention a. Concept of Health, disease, disability and neuro-rehabilitation care delivery within the Indian context incorporating caregiver education and training. b. Need for motivation in neurological patients c. Defining and describing health behavior d. Causes of positive and negative health behaviors e. Theories of behavior and behavior change for exercise health behavior f. Measurement of behavior and behavior change supported by modern technology. g. Application of basic Behavior change h. Techniques for promoting positive healthy lifestyle behavior.

8. Reorganization and recovery a. Neural Plasticity b. Adaptation across musculoskeletal system in nervous system disorders c. Genetic and metabolic influences on neural plasticity d. Effect of Neuropharmacology on exercise, recovery and reorganization

#### PAPER III

#### NEUROPHYSIOTHERAPY ASSESSMENT I,II,III,IV

1. Body Structure and Function Assessment in neurological disorders a. Assessment of Cerebral Cortical function [Such as Consciousness, Higher Functions, Sensory functions, Perception, Motor functions, Synergy, Speech, Vision etc] b. Assessment of cerebral cortical dysfunction in Progressive and Nonprogressive disorders of Central Nervous System c. Assessment of Basal Ganglia functions [Motor planning, Movement initiation and control, Muscle Tone] d. Assessment of dysfunction in movement disorders e. Assessment of Cerebellar functions [Such as Motor coordination, Sensory integration of visual, vestibular and proprioceptive systems] f. Assessment of movement dysfunction in cerebellar disorders g. Assessment of Spinal Cord & Brainstem functions [Such as Muscle functions, Sensory functions, Reflexes and Autonomic functions] h. Assessment of movement dysfunction in Progressive and Nonprogressive disorders of spinal cord i. Assessment of Peripheral nervous system including Muscle and Neuromuscular junction functions [Such as Motor, sensory and peripheral autonomic functions] j. Assessment of sensory, motor and autonomic dysfunction in peripheral nerve injuries, polyneuropathies, neuromuscular junction and muscle disorders k. Screening and Assessment for Primary prevention and Risk reduction of secondary impairments in all neurological disorders. [Such as musculoskeletal, cardiopulmonary, integumentary and vascular system functions] l. Assessment for primary prevention and Risk reduction such as Falls in conditions such as senility, prolonged inactivity, dementia, depression, polypharmacy, vestibular pathology, Fall history etc.
2. Neurological investigations a. Electrophysiological investigations [EMG, SD curve and FG Test, Nerve conduction studies and Evoked Potentials] b. Neuroimaging [Ultrasound, CT, MRI, FMRI, PET, TMS, EEG] c. Biochemical [CSF, Muscle and Nerve Biopsy]
3. Motor Behavior Assessment a. Motor Control and Motor Behavior Assessment in clinical and natural environment i. Postural control assessment ii. Gait assessment and Other Gross movement assessment iii. Reach, Grasp and manipulation Assessment iv. Motor control and Motor Learning Assessment of motor tasks



and functional activities utilizing performance measures and energetics v. Kinematic and kinetic analysis of motor tasks and functional activities and retention measures b. Physical assessment of functions in clinical and natural environment i. Assessment of Activities and Instrumental activities of daily function ii. Assessment of Health Behaviors and Exercise adherence iii. Assessment of Environmental Barriers and Facilitators iv. Assessment of Personal Barriers and Facilitators 4. Activity limitation and Participation Restriction assessment using Functional Outcome Measures a. Generic outcome measures i. Activities of Daily Living ii. Instrumental Activities of Daily Living iii. International Classification of Functioning Outcome measure iv. Participation Level Measure v. Quality of Life Measures b. Disease Specific Measures relevant to Activity and Participation i. CNS Disorder including Movement Disorders and Cerebellar Disorders ii. Spinal Disorders iii. Peripheral Nerve and Muscle Disorders c. Goal setting in progressive and non-progressive neurological disorders across ICF domain outcomes based on rate of prognosis. d. Assessment for assistive technological interventions

#### PAPER IV

#### NEUROPHYSIOTHERAPY TREATMENT I,II,III,IV

1. Treatment of Body structure and Function impairments in neurological disorders. a. Treatment of cerebral cortical dysfunction impairments affecting movement in Progressive and Non-progressive disorders of Central Nervous System. i. Assisting and leading exercise, teaching, enhancing and developing skills of functions of the brain including Global and Specific mental functions. ii. Practice Training of caregivers for Practical and Emotional support with mental functions iii. Training motor planning and control. iv. Assisting and leading exercise for movement functions. Supporting or guiding exercise focusing on functions of motor reflex, involuntary movement reaction, control of voluntary movement, gait pattern functions and sensations related to muscles and movement functions b. Treatment of movement dysfunction and in movement disorders and cerebellar disorders i. Assisting, Training and development of exercises for inhibiting involuntary movement dysfunction and incoordination. ii. Supporting or guiding exercise focused on functions of unintentional, non- or semi - purposive involuntary movements iii. Supporting or guiding exercise focused on initiating and controlling functions of voluntary movements such as cueing c. Treatment of sensory, motor and autonomic dysfunction in Progressive and Non-progressive disorders of spinal cord, peripheral nerves, muscles and neuromuscular junction. i. Training for touch, temperature and other stimuli ii. Teaching, enhancing or developing skills - of sensory functions of sensing surfaces and their texture or quality, sensing temperature, vibration, pressure and noxious stimulus through practice. iii. Education and advice about touch functions, Stimulation of touch functions. iv. Training for Proprioceptive functions v. Teaching, enhancing or developing skills - of sensory functions of sensing the relative position of body parts - through practice vi. Assisting and leading exercise for Proprioceptive functions vii. Training muscle functions viii. Training, Supporting or guiding exercise-focusing functions related to muscle power, muscle tone and muscle endurance ix. Electrical stimulation of muscle functions x. Training Autonomic functions xi. Training control of central and peripheral sympathetic and parasympathetic functions through exercises and biofeedback d. Treatment for Risk reduction of secondary impairments in all neurological disorders. Such as musculoskeletal, cardiopulmonary, integumentary and vascular system functions i. Supporting, Guiding, Educating and Training for the following exercises: Functional Strength Training, Stretching Exercise, Aerobic exercise Planning and prescription, Wound management, Managing DVT, Relaxation Training. e. Treatment for Risk reduction such as Falls in conditions such as senility, prolonged inactivity, dementia, depression, polypharmacy, vestibular pathology, Fall history etc. 2. Neurological Approaches and Technology enabled treatment techniques in retraining CNS and PNS disorders. a. Understanding of Classical

Approaches such as Rood, Bobath, NDT, Brunnstrom, PNF, Sensory Integration and their merits and demerits. b. Retraining with Technology Based Interventions: i. Virtual Reality, ii. Robotic Therapy, iii. Functional Electrical Stimulation, iv. Brain and Spinal cord Stimulation, v. Brain computer interface training vi. Neuro biofeedback therapy vii. Assistive technology

3. Functional Interventions for Promoting Neuroplasticity for improving Motor Behavior in various clinical disorders a. Principles of Neuroplasticity and Motor learning b. Motor Relearning Program c. Systems Model of retraining postural control, locomotion and upper limb activities. d. Task oriented and Functional Training for carrying out General tasks such as lifting and carrying objects, Mobility, self-care, domestic life, and Major life activities. e. Action Observation training and Mirror Therapy

4. Interventions for activity promotion and Participation Facilitation in various neurological disorders a. Behavior Change Techniques for promoting positive health behavior i. Training to influence health behaviours and exercise adherence ii. Education to influence health behaviours and exercise adherence. iii. Advocacy, Advising, counselling and emotional support for health behaviours b. Environmental Enrichment i. Prescription, Education, Advice, Training in and deconditioning from the use of products and technology those adapted or specially designed to assist functioning such as orthotic and assistive devices and technology. ii. Capacity building interventions targeting aspects of natural environment and human-made changes to environment such as environmental remodeling in their home environment. c. Social Environment Enrichment i. Providing education and advice about practical, physical or emotional support provided by people, to encourage a change of functioning, environment, attitude or behavior in relation to health (or risks)

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Wheel: A Guide To Designing Interventions. Silverback Publishing. ISBN-10 : 1912141000 ISBN-13 : 978-1912141005 URL <https://www.who.int/classifications/icf/en/> Recommended Journals 1. Journal of Neurologic Physical Therapy 2. Journal of Motor Behavior 3. Stroke 4. The Journal of Spinal cord Medicine 5. Journal of Parkinson’s Disease 6. Human Movement Science 7. Gait and Posture 8. Motor Control 9. Neural plasticity 10. Neurorehabilitation 11. Neurorehabilitation and Neural repair 12. Journal of neuroengineering and rehabilitation 13. Disability and Rehabilitation 14. African journal of disability 15. International Journal of Behavioral Nutrition and Physical activity 16. International journal of Stroke 17. Movement Disorders 18. Parkinsonism and related disorders 19. Journal of Head Trauma Rehabilitation 20. Topics in spinal cord Injury Rehabilitation 21. Neuromuscular disorders 22. Neurology Asia 23. Neurology India

**FACULTY & INFRASTRUCTURE REQUIREMENTS**

1. Minimum Faculty Position for MPT- Neuro program a. Professor/ Associate Professor – ONE b. Assistant Professor – ONE c. Faculty must be recognized from the area of Neurological sciences Specialty d. Faculty position is inclusive from the minimum faculty position for BPT program 2. Minimum Infrastructure requirement a. Affiliation with a hospital having Neurology department (with both in-patient and out-patient facility) must be established if offering this elective b. The center MUST have ALL the equipment and facilities mentioned under the METHODS OF TRAINING in this ordinance for this specialty in consonance with Schedule IV of the BPT Ordinance. c. A Neuro physiotherapy unit must be established/ available in the institution/ affiliated hospital with the facilities and equipment required to assess and treat Neurological disorders/ dysfunctions. d. Separate Lab or Shared with Movement Science of 1000 sq.ft area Walkway and Community ambulation Training path 10 metres e. Own or in attached facility [Neuroimaging, Electro diagnostic and Biochemical investigation facility] f. The Neuro-physiotherapy unit MUST have all facilities and equipment for Neuro-rehabilitation viz Cognition assessment, Perception assessment, Sensory assessment, Muscle Strength assessment, Motor assessment, Balance, Gait assessment, Grip and Grasp assessment, Functional Assessment, Physical Activity Measurement, Assistive devices, Mobility devices .

**FIRST SEMESTER**

PAPER CODE	SUBJECT	INTERNAL	EXTERNAL	TOTAL
1MPTN01	Fundamentals in Physiotherapy , Pedagogy and Research I	40	60	100
1MPTN02	BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY I	40	60	100
1MPTN03	NEUROPHYSIOTHERAPY ASSESSMENT I	40	60	100
1MPTN04	NEUROPHYSIOTHERAPY TREATMENT I	40	60	100
1MPTN05	PRACTICALS I	40	60	100

**SECOND SEMESTER**

PAPER CODE	SUBJECT	INTERNAL	EXTERNAL	TOTAL
1MPTN01	Fundamentals in Physiotherapy , Pedagogy and Research II	40	60	100
1MPTN02	BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY II	40	60	100
1MPTN03	NEUROPHYSIOTHERAPY TREATMENT II	40	60	100
1MPTN04		40	60	100
1MPTN05	PRACTICALS II	40	60	100

THIRD SEMESTER

PAPER CODE	SUBJECT	INTERNAL	EXTERNAL	TOTAL
3MPTN01	Fundamentals in Physiotherapy , Pedagogy and Research III	40	60	100
3MPTN02	BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY III	40	60	100
3MPTN03	NEUROPHYSIOTHERAPY ASSESSMENT III	40	60	100
3MPTN04	NEUROPHYSIOTHERAPY TREATMENT III	40	60	100
3MPTN05	PRACTICALS III	40	60	100

FOURTH SEMESTER

PAPER CODE	SUBJECT	INTERNAL	EXTERNAL	TOTAL
4MPTN01	Fundamentals in Physiotherapy , Pedagogy and Research IV	40	60	100
4MPTN02	BASIC SCIENCES FOR NEUROLOGICAL PHYSIOTHERAPY 1V	40	60	100
4MPTN03	NEUROPHYSIOTHERAPY ASSESSMENT IV	40	60	100
4MPTN04	NEUROPHYSIOTHERAPY TREATMENT IV	40	60	100
4MPTN05	PRACTICALS IV	40	60	100

CHECK LISTS

APPENDIX 1:

TEACHING SKILL EVALUATION FORM

Student:

Date :

Evaluator:

Rating of Skill

5 - Outstanding

4 - Good

3 - Satisfactory

2 - Poor

1 - Unacceptable

1. Specifies purposes of the lecture clearly in the Introduction
  2. Makes clear transitions between segments of the lecture
  3. Presents divergent view points for contrast and comparison
  4. Uses clear, relevant examples to illustrate main ideas
  5. Clarifies technical terminology
  6. Speaks at suitable volume/ pace, speaking style
  7. Uses eye contact (Scans total audience)
  8. Uses a variety of facial expressions
  9. Uses hands and arms appropriately/moves purposefully
  10. Effectively used Black Board, AV Aids
  11. Summary of main points
  12. Ask questions
  13. Answer questions asked by audience
  14. Content coverage
  15. Rapport with students
- Total Score Overall  
 Score 61 – 75 : Excellent  
 51 – 60 : Good  
 41 – 50 : Satisfactory  
 31 – 20 : Poor  
 Less than 20 : Unacceptable

APPENDIX 2:

JOURNAL CLUB PRESENTATION EVALUATION FORM Student : Date : Evaluator : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Article chosen 2. Specifies purposes / goal of the study 3. Whether cross references have been consulted 4. Presents the Methodology Clearly 5. Clarifies Outcome measures 6. Presents the Results Clearly 7. Power of the study 8. Presents the discussion clearly 9. Limitations of the study 10. Ethical issues 11. Describe how the results can or cannot be applied in our situation 12. Their own decision about the utility of the study in our practice 13. Does not needed to reread article 14. Summarizes Presentation 15. Ability to defend their study Total Score Overall Score 61 – 75 : Excellent 51 – 60 : Good 41 – 50 : Satisfactory 31 – 20 : Poor Less than 20 : Unacceptable

APPENDIX 3:

PERFORMANCE EVALUATION FORM Student : Date : Evaluator : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Patient Interview 2. Physiotherapy observation skills 3. Physiotherapy assessment skills 4. Procedural skills 5. Knowledge of physiotherapy Instrumentation 6. Treatment planning 7. Principle of treatment intervention 8. Execution of treatment intervention 9. Evidence Based Practice 10. Practice based learning and improvement 11. Planning and conducting clinical research 12. Work Ethics 13. Interpersonal skills / Communication skills 14. Instructional skills 15. Documentation Total Score Overall Score 61 – 75 : Excellent 51 – 60 : Good 41 – 50 : Satisfactory 31 – 20 : Poor Less than 20 : Unacceptable

APPENDIX 4:

SEMINAR EVALUATION FORM Student : Date : Evaluator : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Met the Professional objectives 2. Makes clear transitions between segments of the lecture 3. Presents divergent view points for contrast and comparison 4. Presentation was logical and clear 5. Clarifies terminologies in Physiotherapy 6. Speaks at suitable volume/ pace, speaking style 7. Eye contact 8. Absence of distracting mannerisms 9. Effectively used Black Board, AV Aids 10. Content coverage 11. Provide appropriate du ration 12. Interaction with others was beneficial 13. Provided concise and thoughtful answer to the questions asked by the audience 14. Demonstrated competence in Subject matter 15. Present the references and Sources effectively Total Score Overall Score 61 – 75 : Excellent 51 – 60 : Good 41 – 50 : Satisfactory 31 – 20 : Poor Less than 20 : Unacceptable

APPENDIX 5:

CASE PRESENTATION EVALUATION FORM Student : Date : Evaluator : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Subjective Examination 2. Objective Examination 3. Logical sequences 4. Treatment planning 5. Demonstration of examination skills 6. Demonstration of intervention skills 7. Explain the rationale of Treatment interventions 8. Understanding of movement dysfunction 9. Clarity of Presentation 10. Answer to the questions Total Score Overall Score 41 – 50 : Excellent 31 – 40 : Good 21 – 30 : Satisfactory 15 – 20 : Poor Less than 15 : Unacceptable

APPENDIX 6:

DISSERTATION PRESENTATION EVALUATION FORM Student : Date : Evaluator : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Selection of topic 2. Knowledge about the selected topic 3. Need of the study 4. Statement of hypothesis 5. Review of literature 6. Selection of research design 7. Selection of appropriate Sample size 8. Selection of appropriate Sampling technique 9. Selection of appropriate statistical tool 10. Selection of appropriate Outcome measures 11. Quality of protocol 12. Power of the study 13. Logical sequence of presentation 14. Answer questions asked by evaluators 15. Use of research terminologies Total Score Overall Score 61 – 75 : Excellent 51 – 60 : Good 41 – 50 : Satisfactory 31 – 20 : Poor Less than 20 : Unacceptable

APPENDIX 7:

EVALUATION OF DISSERTATION WORK BY THE GUIDE Student : Date : Guide : Rating of Skill 5 - Outstanding 4 - Good 3 - Satisfactory 2 - Poor 1 - Unacceptable 1. Periodic consultation with the guide 2. Regular collection of case material 3. Depth of analysis and discussion 4. Presentation of findings 5. Quality of final output Total Score Overall score: 21 – 25 - Outstanding 16 – 20 - Good 11 – 15 - Satisfactory 6 – 10 - Poor 5 and below 5 – Unacceptable

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