

SYLLABUS FOR
MASTERS OF PHYSIOTHERAPY (M.P.T)
IN
NEUROLOGY

M.P.T (NEUROLOGY)

FIRST YEAR

Paper Code	Subject	Hours
1.1	Medical and Surgical Management of Disorders of the Nervous system.	100
1.2	Physiotherapy Management in Disorders of the Nervous system – I	125
1.3	Physiotherapy Management in Disorders of the Nervous system - II	125
1.4	Physiotherapy Management in Disorders of the Nervous system – (Lab Hours)	50
1.5	Research Methodology and Bio-Statistics	100
1.6	Seminars on Clinical Issues	100
	Clinical Practice	1100
	Total	1700 hours

SECOND YEAR

Paper Code	Subject	Hours
2.1	Pedagogy in Physiotherapy Education	100
2.2	Management, Administration and Ethical Issues	75
2.3	Bio-mechanics	150
2.3A	Bio-mechanics (Lab Hours)	25
2.4	Dissertation	200
2.5	Seminars on Clinical Issues	100
	Clinical Practice	1100
	Total	1750 hours

M.P.T (NEUROLOGY)

FIRST YEAR

M.P.T 1.1 MEDICAL AND SURGICAL MANAGEMENT OF DISORDERS OF THE NERVOUS SYSTEM

This course provides the student with information on the epidemiology, Pathomechanics, clinical presentation, relevant diagnostic test and medical and surgical management of disorders of the Nervous system. Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

NEUROLOGY

Following are the topics to be included but not limited to: Epidemiology, Pathomechanics, clinical presentation, relevant diagnostic test and medical management of disorders of the Nervous system.

1. **Congenital and hereditary disorders.**
2. **Disorders of cerebral circulation**
3. **Head injury**
4. **Infections disorders**
5. **Disorders of spinal cord and cauda equine**
6. **Disorders of Peripheral Nerves**
7. **Disorders of Muscle**
8. **Cerebellar disorders**
9. **RSD, Epilepsy, Dementia, Alzheimer's**
10. **Disorders of the Vestibular system**
11. **Extrapyramidal disorders etc.**

NEURO SURGERY

Surgical Management of the above conditions, indications, contra-indications for surgery, precautions after Surgery. Also included:

General Principles

Tumours

Intracranial abscess

Hydrocephalus

Stereotactic surgery

Cerebral Malformations

Operations on the discs-cervical & Lumbar disc operation

Malformation of the spine and spinal cord

Lumbar and cisternal punctures technique and complications

General rules of surgical repair of the peripheral nerves

Muscle Lengthening/ Release

Spasticity

ICU Management of the neurologically impaired patients

(M.P.T) 1.2 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE NERVOUS SYSTEM- 1

This course provides students with the principles of Physiotherapy management in disorders of the nervous system and the application of these principles in specific disorders.

Through lectures, case conferences, journal discussions and class discussions students will be able to set up a treatment programme tailored to the patient's needs.

Following are the topics to be included but not limited to:

SECTION – 1 GENERAL PRINCIPLES

1. **Development of a child**
2. **Neuro development techniques**
3. **Principles and technique of MRP**
4. **Principles and technique of PNF**
5. **Motor control and learning**
6. **Balance and coordination**
7. **Assessment and management of pain**
8. **Group exercises**
9. **P.T. in home setting**
10. **Bio-feed back**
11. **Critical analysis of exercise and electro therapeutic modalities.**
12. **Disability evaluation.**

MPT 1.3 P.T. MANAGEMENT IN DISORDERS OF THE NERVOUS

SYSTEM-II

Assessment and management of condition Topics as listed in (M.P.T) 1.1

(M.P.T) 1.4 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE NERVOUS SYSTEM (LAB HOURS)

Students will be instructed via demonstration, hands of techniques, field visits and case conferences on specific techniques used in management of patients with neurological disorders.

Students will on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.

(M.P.T) 1.5 RESEARCH METHODOLOGY AND BIOSTATISTICS

Students will be provided an understanding of statistical measures used in the analysis and interpretation of research data. Information on research designs and their implementation will be provided.

This course will be the students to read critique research articles and understand and apply the principles of research to perform a guided research as part of their course requirement following are the topics to be included but not limited to:

SECTION -1 RESEARCH METHODOLOGY

1. How are read and critique research
2. Introduction to research: framework; levels of measurement; variables
3. Basic research concepts; validity and reliability
4. Design, instrumentation and analysis for qualitative research
5. Design, instrumentation and analysis for quantitative research
6. Design, instrumentation and analysis for quasi-experimental research
7. How to write a research proposal
8. The use and protection of Human and Animal Subjects.

SECTION- II BIOSTATISTICS

1. Descriptive and inferential statistics
2. Types of data: Qualitative and Quantative
3. Frequency distributions
4. Describing data with Graphs
5. Describing data with Averages Mode, Median, Mean
6. Describing variability Variance, Standard deviation, etc.

7. Normal Distributions
8. Interpretation of r
9. Hypothesis testing
10. T tests
11. ANOVA
12. Probability
13. Type I and Type II errors
14. Parametric and Non- Parametric tests
15. Which tests to use
16. Basic of computers – Hardware and Software
17. Basic of computer Applications – Windows, MS Word, Power Point, etc.
18. Simple statistical analysis using available software.

(M.P.T) 1.6 SEMINARS ON CLINICAL ISSUES

These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provide to them.

CLINICAL PRACTICE

Students will engage in clinical practice in physiotherapy Department in the neurological setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

M.P.T (NEUROLOGY)

SECOND YEAR

(M.P.T) 2.1 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

This course will be provide students information on improving their teaching skills in the classroom and clinical setting

Following are the topics to be included but not limited to:

- 1 **Philosophy of educational and Emerging Issues in Education**
Meaning, Functions and Aims of Education
Formal, informal and Non-formal Education.
Agencies of Education
Current Issues and trends in Higher Education
Issue of quality in Higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilitlies.
Need for Education Philosophy
Some major philosophies, Idealism Naturalism, Pragmatism and their Implications for Education.
- 2 **Concept of Teaching and Learning**
Meaning scope of Educational Psychology
Meaning and Relationship between Teaching and Learning
Learning Theories
Dynamics of Behaviour
Individual Differences
- 3 **Curriculum**
Meaning and concept
Basis of curriculum Formulation Development
Framing Objectives for Curriculum
Process of Curriculum Development and Factors Affecting Curriculum
Development Evaluation of Curriculum
- 4 **Method and Techniques of Teaching**
Lecture, Demonstration,
Discussion, Seminar, Assignment, Project and Case Study
- 5 **Planning for Teaching**
Bloom's Taxonomy of Instructional Objectives, in Behaioural terms, Unit planning and Lesson Planning.
- 6 **Teaching Aids**
Types of teaching Aides
Principles of Selection, Preparation and Use of Audio – Visual aids.
- 7 **Measurement and Evaluation**
Nature of Educational Measurement: Meaning, Process, Types of Tests.
Construction of an Achievement test and analysis
Standardized Test.
Introduction of some Standardized tools, important tests of Intelligence, Aptitude, Personality.

- Continuous and Comprehensive Evaluation.
- 8 **Guidance and Counseling**
 Meaning and Concepts of Guidance and Counseling
 Principles
 Guidance and Counseling Services of Students and Faculty members
 Faculty Development and Development of Personnel for P.T. Services
- 9 **Clinical Education**
 Awareness and Guidance to the Common people about Health & Diseases and Available professional Services.
 Patient Education
 Education of the Practitioners

(M.P.T) 2.2 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

This course deals with issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department following are the topics to be included but limited to:

MANAGEMENT

1. **Functions of management,**
2. Evaluation of management through scientific management theory,
 Classical theory
 System approach
 Contingency approach
3. **Management process**
 Planning, Organization, direction, controlling decision making
4. **Introduction of personnel management**
 Staffing recruiting selection, performance appraisal, collective bargaining, discipline, job satisfaction.
5. **Quantitative methods of management**
 Relevance of statistical and/or techniques in management
6. **Marketing**
 Market segmentation, marketing research production planning pricing, channels of distribution, promotion, consumer behaviour, licensor.
7. **Total quality management**
 Basis of quality management- acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization**
 Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.
- 2 **Roles of Physiotherapist, Physiotherapy Director, Physiotherapy Supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.**

1. Directed care and referral relationship and confidentiality.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct.
3. Legal responsibility for their actions in the professional context and understanding the physiotherapy liability and obligations in the case of medical legal action.
4. Code of ethics ,A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.
8. Current issues.

M.P.T 2.3 BIOMECHANICS

Students will be able to identify and apply principles of bio-mechanics while setting up individualized treatment protocols.

FUNDAMENTAL MECHANICS

Forces

Moments

Newton's laws

Composition and resolution of forces

Static equilibrium

Dynamic equilibrium

Force systems

Lever

Pulley Systems

Density & Mass

Segmental dimensions

KINEMATICS

Types of Motion

Location of Motion

Magnitude of Motion

Direction of Motion

Angular motion and its various parameters

Linear motion and its various parameters

Projectile motions

KINETICS

Definitions of forces

Force vectors
Naming of Force
Force of gravity & Cog
Stability
Reaction forces
Equilibrium
Linear forces system
Friction and its various parameters
Parallel force system
Concurrent force systems
Work powers & energy
Moment arms of force
Force components
Equilibrium of force

FLUID MECHANICS

Various laws governing the flow of fluids
Various laws governing the volume of fluids
Various laws governing the pressure of fluids
Various laws governing the energy of fluids
Various parameters explaining the flow
Various parameters describing the fluids
Clinical applications

BONE MECHANICS

Structure & composition of bone
Stress
Strain
Modulus of rigidity of modular of elasticity
Poisson's effect
Strain energy
Static & cyclic load behaviours
Load
Mechanical properties of trabecular bone
Mechanical properties of cortical bone
Bone remodeling
Response of the bone to aging & exercise & immobilization
Mechanism to prevent fracture present in bone
Fracture of prediction
Behavior of bone under load
Clinical applications
Failure criteria

MUSCLES MECHANICS

Structure & composition of muscle

Fiber length & cross section area

Mechanical properties

EMG changes during fatigue & contraction

Changes in mechanical properties because of ageing and exercised & immobilization

Clinical applications

LIGAMENT & TENDON MECHANICS

Structure and composition

Mechanical properties

Cross section area measurements

Muscle tendon properties

BIOMECHANICS IN NERVOUS CONDITION

This course involves application of bio-mechanical principles to Nervous conditions

MEASUREMENT INSTRUMENTS

Goniometer

Accelerometer

Photo optical devices

Pressure transducers and force plates

Gait analyzer

Isokinetic device

EMG

Electro physiology of muscle contraction

Recording

Processing

Relationship between EMG and bio-mechanical variables.

MECHANICAL ENERGY, WORK AND POWER

Definitions

Positive and Negative work of muscle

Muscle of mechanical power

Causes of inefficient movement

Co-contraction

Isometric contraction

Energy generation at one joint and absorption at another

Energy flow

Energy storage

ERGONOMICS

APPLICATION OF BONE AND JOINT MECHANICS

Load sharing & load transfer

Prosthetic design criteria

Bio-mechanical analysis of implants internal fixations

Regenerative change in weight bearing joints & compensatory actions

GAIT

Gait parameter

Kinetic

Kinematic

Time-Space

Pathological gait

Running

Stair climbing

Changes in gait following various surgeries/ diseases/ disorders

ORTHOSIS & PROSTHESIS

Orthosis of spine

Orthosis of upper limb

Orthosis of lower limb

Prescriptions checkouts & proper fittings

Bio-mechanical principal governing them

Aids used in management of disability

NEURODYNAMICS

(M.P.T) 2.4 (A) BIOMECHANICS IN NEUROLOGICAL CONDITION (LABOURS)

This involves application of topics in M.P.T 2.4 via demonstrations, field visits and case presentations

(M.P.T) 2.5 THESIS (DESSERTATION)

As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide.

Issues of Neurological disorders may be studied on patients or normal individuals.

(M.P.T) 2.6 SEMINARS ON CLINICAL ISSUES

These will serve a platform for students to integrate various components of patient management. Students will give presentations on topics provided to him.

CLINICAL PRACTICE

Student will engage in clinical in Physiotherapy Departments in the neurology setting to enhance their clinical skills and apply theoretical knowledge gaining during sessions.