SYLLABUS FOR

MASTERS OF PHYSIOTHERAPY (M.P.T)

IN

ORTHOPEDICS

M.P.T (ORTHOPAEDICS)

FIRST YEAR

Paper code	Subject	Hours
1.1	Medical and Surgical Management of Disorders of the Musculoskeletal System	100
1.2	Physiotherapy Management in Disorders of the Musculoskeletal System –I	125
1.3	Physiotherapy Management in Disorders of the Musculoskeletal System – II	125
1.4	Physiotherapy Management in Disorders of the Musculoskeletal 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	100
2.3	Bio-mechanics	150
2.4	Bio-mechanics (Lab Hours)	50
2.5	Dissertation	200
2.6	Seminars on Clinical Issues	150
	Clinical Practice	1100
	Total	1850 hours

MPT (ORTHOPAEDICS)

FIRST YEAR

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

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

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 musculoskeletal system. Surgical Management, indications, contra-indications for surgery, precautions after surgery.

GENERAL ORTHOPAEDICS

Metabolic Disorders of the Bone and Joints.
Infections Disorders of the Bone and Joints.
Congenital Disorders of the Bone and Joints.
Inflammatory Disorders of the Bone and Joints.
Myopathies.
Neurological Disorders.
Bone and Joint Tumours.
Complex Regional Pain Syndromes.

REGIONAL ORTHOPAEDICS

Disorders of Upper Limb
Disorders of Lower Limb
Disorders of the Spine

TRAUMATOLOGY

Trauma of the Upper Limb
Trauma of the Lower Limb
Trauma of the Spine
Trauma of the Peripheral Nerves

(M.P.T) 1.2 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE MUSCULOSKELETAL SYSTEM

This course provides students with the principles of Physiotherapy management in disorders of the musculoskeletal system and the application of these principles in specific disorders.
Through lectures, case conference, 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 include but not limited to:

SECTIONS -1 GENERAL PRINCIPLES

P.T. Assessment

Manipulation and Mobilization Techniques

Critical Analysis of Electrotherapeutic Modalities.

Exercise Training Programmes

Various Stretching Techniques

Disability Evaluation.

Assessment and Management of Pain.

Soft Tissue Mobilizations.

Muscle Energy Techniques.

PT in home setting.

SECTION – II PHYSIOTHERAPY MANAGEMENT IN SPECIFIC CONDITIONS

Topics as listed in (M.P.T) 1.1

MPT 1.3 P.T. MANAGEMENT IN DISORDERS OF THE MUSCULOSKELETAL SYSTEM- II

Topics as listed in (M.P.T) 1.1

(MPT) 1.4 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE MUSCULOSKELETAL 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 musculoskeletal orders. Students will on their experience 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

How are read and critique research.

Introduction to research: framework; levels of measurement; variables.

Basic research concepts; validity and reliability

Design, instrumentation and analysis for qualitative research

Design, instrumentation and analysis for quantitative research

Design, instrumentation and analysis for quasi- experimental research

How to write a research proposal

The use and protection of human and animal subjects.

SECTION – II BIOSTATISTICS

Descriptive and Inferential statistics

Types of data: Qualitative and Quantitative

Frequency distributions

Describing data with Graphs

Describing data with Averages Mode, Median, Mean

Describing variability Variance, Standard deviation, etc.

Normal Distributions

Interpretation of r

Hypothesis testing

T tests

ANOVA

Probability

Type I and Type II errors

Parametric and Non- Parametric tests

Which tests to use

Basic of computers – Hardware and Software

Basic of Computer Applications – Windows, MS word, Power Point, etc.

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 Department of Orthopaedic Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

MPT (ORTHOPAEDIC)

SECOND YEAR

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

This course will be provided 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
   Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
   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, Writing Instructional Objectives in Behavioural 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 and 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 recruitment 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, licenser.
1. 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.

3. Director care and referral relationship and confidentially.

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 physiotherapist 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.

MPT 2.3 BIOMECHANCS

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

FUNDAMENTAL MECHANICS

Forces

Moments

Newton's lows

Composition and Resolution of forces.

Static Equilibrium

Dynamic Equilibrium

Force systems

Levers

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

Modules of rigidity & 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

Mechanisms to prevent fracture present in bone

Fracture of prediction

Behaviour of bone under load

Clinical applications

Failure criteria

MUSCLES MECHANICS

Structure & composition of muscle

Fiber length & cross section area

Mechanical propertied

EMG changes during fatigue & contraction

Changes in mechanical properties because of aging and exercised & immobilization

Clinical applications

LIGAMENT & TENDON MECHANICS

Structure and composition

Mechanical properties

Cross sectional area measurements

Muscle tendon properties

Temperature sensitivity

Changes in mechanical properties because of aging exercise and immobilization

Mechanorecptors

Clinical applications

JOINT MECHANICS

- Joint Design
- Joint categories
- Joint functions
- Arthrokinematics
- Osteokinematics
- Kinematics chairs
- Joint forces, equilibrium & distribution of these forces
- Joint stability & its mechanism
- Articular Cartilage Mechanics
- Clinical applications

MEASUREMENT INSTRUMENTS

Goniometer

Acceleremeter

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.

Degenerative changes in weight bearing joints & compensatory actions.

BIOMECHANICS IN SPORTS CONDITIONS

This course involves application of bio-mechanical principles to sports conditions.

CARDIOPULMONARY MECHANICS

Rheology

Cardiac Mechanics

Pulmonary Mechanics

Rib Cag Movements

GAIT

1. Gait parameter
   - Kinetic
   - Kinematic
   - Time- Space
2. Pathological gait
3. Running
4. Stair climbing
5. Changes in gait following various surgeries/ diseases/ disorders

ORTHOSIS & PROSTHOSIS

1. Orthosis of spine
2. Orthosis of upper limb
3. Orthosis of lower limb
4. Prescriptions checkouts & proper fittings
5. Bio-mechanical principles governing them
6. Aids used in management of disability.

(M.P.T) 2.4 A BIOMECHANICS IN MUSCULOSKELETAL CONDITIONS (LAB HOURS)

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

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

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.

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

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

CLINICAL PRACTICE

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