CHAUDHARY CHARAN SINGH UNIVERSITY MEERUT

SYLLABUS

FOR

MASTER OF PHYSIOTHERAPY COURSES

BRANCHES

M.P.T (SPORTS MEDICINE)

M.P.T (ORTHOPAEDICS)

M.P.T (NEUROLOGY)

M.P.T (CARDIOTHORACIC)

SYLLABUS FOR

MASTERS OF PHYSIOTHERAPY (M.P.T)

IN

SPORTS MEDICINE

M.P.T (SPORTS MEDICINE)

FIRST YEAR

1.	Medical and Surgical Management of Sports Injuries	100
2.	Physiotherapy Management in Sports Injuries – I	125
3.	Physiotherapy Management in Sports Injuries – II	125
4.	Physiotherapy Management in Sports Injuries – (Lab Hours)	50
5.	Research Methodology and Biostatistics	100
6.	Seminars on Clinical Issues	100
	Clinical Practice	1100
	Total	**1700 hours**

SECOND YEAR

1.	Pedagogy in Physiotherapy Education	100
2.	Management, Administration and Ethical Issues	75
3.	Biomechanics	150
2.3A	Biomechanics in Sports (Lab Hours)	25
2.4	Dissertation	200
2.5	Seminars on Clinical Issues	100
	Clinical Practice	1100
	Total	**1750 hours**

MPT (SPORTS MEDICINE)

FIRST YEAR

M.P.T 1.1 MEDICAL AND SURGICAL MANAGEMENT SPORTS RELATED INJURIES

This course provides the student with in information on the epidemiology, Pathomechanics, clinical presentation, relevant diagnostic test and medical and surgical management in sports related injuries.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:

SPORTS RELATED INJURIES

1. **Sports injuries of the upper limb.**
2. **Sports injuries of the lower limb.**
3. **Sports injuries of the spine**
4. **Sports injuries of the Head and Neck**
5. **Medical Problems of the athlete**
6. **Emergency care**
7. **Sports psychology**

   Definition of the term

   Sports psychology, Role of sports psychology in sports performance

   Dynamics of human behaviour

   1. Instincts
   2. Attention, interest and motivation

   Personality in the sports person

   Learning

   Nature and meaning of learning and maturation

   Characteristics of learning

   Laws of learning maturation

   Transfer of training

Group behaviours & leadership

Nature of group behaviours

Types, quality, training and function of leadership

Anxiety, model stress and its implications on performance

Isolated training
Sudden change in opponent
Audience stresses
Strategy changes
Cognitive stress modeling.
Contemporary stress reduction strategies
Biofeedback
Mental coping strategies
Visual imagery
Meditation

Performance factors

Stress and performance

Motivation & performance

Diet and nutrition

Nutrition for sports person

Nutritional assessment in different sports

Nutritional recommendations in various sports

Weight management

Body composition analysis

Uses & importance of various micro & macro NutrieNTS

SURGICAL MANAGEMENT OF SPORTS RELATED INJURIES

Surgical management of the above conditions, indications, contraindications for surgery, precautions after surgery.

M.P.T 1.2 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE SPORTS MEDICINE - I

This course provides students with the principles of Physiotherapy management in sports related injuries and in sports training and the application of these principles in specific

disorders.

Through lectures, case conferences, journal discussions and class discussion 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 – I GENERAL PRINCIPLES

1. **P.T. Assessment**
2. **Physiology of rehabilitation**
3. **Applied Bio-mechanics in sports Rehabilitation**
4. **Protective equipment considerations**
5. **Special consideration like female athlete, adolescent athlete. Disabled athlete, doping, etc.**
6. **Emergency care**
7. **Special exercise programmes for sports person**
8. **Sports for disabled**
9. **Sports massage**
10. **Taping**
11. **PNF techniques in sports.**

MPT 1.3 P.T. MANAGEMENT IN DISORDERS OF THE SPORTS INJURIES – II TOPICS AS LISTED IN (M.P.T) 1.1

PHYSIOTHERAPY MANAGEMENT OF INJURIES RELATED TO SPECIFIC SPORTS

This includes the application of the above two sections to specific sports like the following:

1. Injuries related to cricket
2. Injuries related to judo
3. Injuries related to throw ball
4. Injuries related to basket ball

5. Injuries related to discuss throw
6. Injuries related to Base- ball
7. Injuries related to Badminton
8. Injuries related to Tennis
9. Injuries related to Gymnastics
10. Injuries related to Javelin
11. Injuries related to Football

M.P.T 1.4 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE SPORTS INJURIES (LAB HOURS)

Students will be instructed via demonstration, hands of techniques, field visits and case conference on specific techniques used in management of patients with sports injuries. 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:

SECTOION – I 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 qualitative 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 Quantitative
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 provided to them.

CLINICAL PRACTICE

Students will engage in clinical practice in physiotherapy in specialty wise settings to enhance their clinical skills and apply theoretical knowledge gained during teaching

sessions.

MPT (SPORTS MEDICINE)

SECOND YEAR

MPT 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 education and Emerging Issues in Education**

   Need for Education Philosophy :Some Major Philosophies, Idealism, Naturalism, Pragmatism and their Implications for 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 Disabilities.

2. **Concept of Teaching and Learning**

   Meaning scope of Educational Psychology

   Meaning and Relationship between Teaching and Learning

   Learning Theories

   Dynamics of Behaviour

   Individuals Differences

3. **Curriculum**

   Meaning and concept

   Basis of curriculum Formulation & Development

   Framing Objectives for Curriculum

   Process of Curriculum Development and Factors Affecting Curriculum

Developmental 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

MPT 2.2 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

This course deals with issues of management to assist the practitioner in efficient

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,**
    a. Classical theory
    b. System Approach
    c. Contingency approach
3. **Management process**

    Planning, Organization, Direction, Controlling, Decision making
4. **Introduction to personnel management.**

    Staffing, Recruitment, Selection, Performance appraisal, Collective bargaining, discipline, Job satisfaction.
5. **Quantitative methods of management**

    Relevance of statistical and/ or technique 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 Aide, Volunteer.

3. Directed 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 BIOMECHANCIS

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

FUNDAMENTAL MECHANICS

1. Forces
2. Moments
3. Newton's lows
4. Composition and Resolution of forces.
5. Static Equilibrium
6. Dynamic Equilibrium
7. Force systems
8. Levers
9. Pulley Systems
10. Density & Mass
11. Segmental Dimensions

KINEMATICS

1. Types of Motion
2. Location of Motion
3. Magnitude of Motion
4. Direction of Motion
5. Angular motion and its various parameters
6. Linear motion and its various parameters.
7. Projectile motions.

KINETICS

1. Definitions of forces
2. Force vectors
3. Naming of Force
4. Force of gravity & Cog
5. Stability
6. Reaction forces
7. Equilibrium
8. Linear forces system
9. Friction and its various parameters
10. Parallel force system
11. Concurrent force systems
12. Work powers & energy
13. Moment arms of force
14. Force components
15. Equilibrium of force

FLUID MECHANICS

1. Various laws governing the flow of fluids
2. Various laws governing the volume of fluids
3. Various laws governing the pressure of fluids
4. Various laws governing the energy of fluids
5. Various parameters explaining the flow
6. Various parameters describing the fluids
7. Clinical applications

BONE MECHANICS

1. Structure & composition of bone
2. Stress
3. Strain
4. Modules of rigidity & modular of elasticity
5. Poisson's effect
6. Strain energy
7. Static & cyclic load behaviours
8. Load
9. Mechanical properties of trabecular bone
10. Mechanical properties of cortical bone
11. Bone remodeling
12. Response of the bone to aging & exercise & immobilization
13. Mechanisms to prevent fracture present in bone
14. Fracture of prediction
15. Behaviour of bone under load
16. Clinical applications
17. Failure criteria

MUSCLES MECHANICS

1. Structure & composition of muscle
2. Fiber length & cross section area
3. Mechanical propertied
4. EMG changes during fatigue & contraction
5. Changes in mechanical properties because of aging and exercised & immobilization
6. Clinical applications

LIGAMENT & TENDON MECHANICS

1. Structure and composition
2. Mechanical properties
3. Cross sectional area measurements
4. Muscle tendon properties

5. Temperature sensitivity
6. Changes in mechanical properties because of aging exercise and immobilization
7. Mechanorecptors
8. Clinical applications

JOINT MECHANICS

1. Joint Design
2. Joint categories
3. Joint functions

- Arthrokinematics
- Osteokinematics
- Kinematics chairs

4. Joint forces, equilibrium & distribution of these forces
5. Joint stability & its mechanism
6. Articular Cartilage Mechanics
7. Clinical applications

MEASUREMENT INSTRUMENTS

1. Goniometer
2. Acceleremeter
3. Photo optical devices
4. Pressure transducers and force plates
5. Gait analyzer
6. Isokinetic device
7. EMG
    - Electro physiology of muscle contraction
    - Recording
    - Processing
    - Relationship between EMG and bio-mechanical variables.

MECHANICAL ENERGY, WORK AND POWER

1. Definitions

2. Positive and Negative work of muscle
3. Muscle of mechanical power
4. Causes of inefficient movement

- Co-contraction
- Isometric contraction
- Energy generation at one joint and absorption at another
- Energy flow

5. Energy storage

ERGONOMICS

BIOMECHANICS IN SPORTS CONDITIONS

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

CARDIOPULMONARY MECHANICS

1. Rheology
2. Cardiac Mechanics
3. Pulmonary Mechanics
4. 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. Prescription checkouts & proper fittings
5. Bio-mechanical principles governing them
6. Aids used in management of disability

MPT 2.4 BIOMECHANICS IN SPORTS INJURIES (LAB HOURS)

This involves application of topics in MPT 2.3 via demonstrations, field visits and case presentations.

MPT 2.5 THESIS (DISSERTATION)

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 sports disorders may be studied on patients or normal individuals.

MPT 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 sports setting to enhance their clinical skills and apply theoretical knowledge gaining during teaching sessions.