MASTERS OF PHYSIOTHERAPY (MPT)
DEGREE COURSE
First year MPT

Paper Code – MPT101 Basic Sciences
Paper Code – MPT 102 Physical and functional diagnosis
Paper Code – MPT 103 Advanced physiotherapeutic
Paper Code - MPT 104 Clinical training
Paper Code – MPT 105 Practical 1 - Physiotherapeutic

Second year MPT

3. SPECIALITIES OFFERED:
Candidates shall be examined in one of the following Specialty branches

Paper Code - MPT 201 Physiotherapy assessment
Paper Code – MPT 202 Physiotherapy Interventions

1. Branch I Physiotherapy in Orthopedics
2. Branch II Physiotherapy in Neurology
3. Branch III Physiotherapy in Cardio - Respiratory
4. Branch IV Physiotherapy in Pediatrics
5. Branch V Sports Physiotherapy
6. Branch VI Physiotherapy in Obstetrics and Gynecology
7. Branch VII Physiotherapy in Hand conditions
8. Branch VIII Community Physiotherapy
9. Branch IX Geriatric Physiotherapy
COURSE CONTENT AND STRUCTURE

PAPER I
APPLIED BASIC SCIENCES

This paper consists of 4 Modules:

I Bio Statistics and Research Methodology
II. Biomechanics and Pathomechanics
III. Ergonomics
IV. Nutrition and Exercise Physiology

Module I - Bio Statistics, Research Methodology

PART I.
1. Research fundamentals
Research in Physiotherapy
Theory in Physiotherapy research
Research ethics
2. Research design
Research problems, questions and hypotheses
Research paradigms
Design overview
Research validity
Selection and assignment of subjects
3. Experimental designs
Group designs
Single system design
4. Non experimental design
Overview of non experimental research
Qualitative research
Epidemiology
Outcome research
Survey research

Part II Measurement and Analysis
1. Measurement
Measurement theory
Methodological research
Measurement tools for Physiotherapy research

2. Data Analysis
   Statistical reasoning
   Statistical analysis of differences: The basics
   Statistical analysis of differences: Advanced and special techniques
   Statistical analysis of relationship: The basics
   Statistical analysis of relationship: Advanced and special techniques

Part III Locating and Evaluating the Literature

Part IV Implementing Research
1. Implementing the projects
2. Publishing and presenting research

Recommended Books
1. Rehabilitation Research: Principles and Applications by Elizabeth Domholdt (Elsevier Science Health Science Div, 2004)

Module II Biomechanics and Pathomechanics

Part I Foundational concepts in Bio and Pathomechanics
Unit:
1. Basic concepts in biomechanics
2. Biomechanics of tissues and structures of the musculoskeletal system
   • Bone
   • Articular cartilage
   • Tendons and ligaments
   • Peripheral nerves
   • Skeletal muscle
3. Functional adaptation of bone under pathological conditions
4. Mechanics of joint and muscle action
5. Body balance and equilibrium

Part II Biomechanics and Pathomechanics of joints
Unit:
1. Upper extremity
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2. Lower extremity
3. Vertebral column  
4. Thorax and chest wall  
5. Temporal mandible joint 

**Part III Biomechanics of integrated function**  
**Unit:**  
1. Gait  
2. Posture  
3. Arm as a whole  

**Recommended books**  
1. Basic biomechanics of the musculoskeletal system by Margareta Nordin and Victor H. Frankle, 2nd edition (Lea and Febiger)  
5. The Physiology of the Joints by Kapandji & Matthew J Kendel (Churchill Livingstone, 2008)  
7. Kinesiology :The mechanics and Pathomechanics of Human Movement by Carol Oatis (Lippincott Williams & Wilkins; 2008)  

**Module III Ergonomics**  

**Unit**  
1. History of ergonomics  
2. Worker care spectrum  
3. Functional assessment  
4. Weighted capabilities  
5. Participation level  
6. Postural examination  
7. Job analysis  
8. Work hardening programme  
9. Exit assessment
10. Pre-employment screening
   - Job analysis
   - Job task analysis
   - Job site analysis
11. Work capacity analysis
12. Role of Physiotherapy in industrial set up
13. Workers functional capacity assessment
14. Industrial therapy
15. Educational programme for prevention of injury
16. Adult education
17. Injury prevention and ergonomics
Recommended books
1. Industrial Therapy by Glenda L. Key, 1st Edition (Mosby)

Module IV Nutrition and Exercise physiology

Part I Basic Exercise Physiology
Unit
1. Introduction to exercise physiology
2. Nutrition and Performance
3. Energy transfer
4. Measurement of human energy expenditure
5. Systems of energy delivery and utilization
   • Pulmonary system
   • Cardiovascular system
   • Musculoskeletal
   • Nervous System
   • Endocrine system

Part II Applied Exercise Physiology
Unit
1. Aerobic power training
2. Anaerobic power training
3. Special aids in performance and conditioning
4. Exercise at different altitudes
5. Exercise at various climatic conditions
6. Sport diving
7. Obesity and weight control
8. Exercise and aging
9. Clinical exercise physiology

Recommended Books
1. Exercise Physiology by Mc Ardle, Katch & Katch (Lippincott Williams and Wilkins, 2000)
2. Exercise Physiology: Exercise, Performance, and Clinical Applications by Robert A. Roberts and Scott O Roberts William C Brown, 1997)
PAPER - II

Physical and Functional diagnosis-I

1. Clinical examination in general and declaration of movement dysfunction.
2. Principles of pathological investigations and imaging techniques related to neuromuscular, skeletal and cardiopulmonary disorders with interpretation.
4. Anthropometric measurements
5. Physical fitness assessment by
   a. ROM
   b. Muscle strength, endurance and skills
   c. Body composition
   d. Cardiac efficiency tests and spirometry
   e. Fitness test for sports
6. Psycho-physiological and neuro-psychological tests
8. 14. ICIDH and ICF
9. Massage, mobilization and manipulations
10. Geriatric physiotherapy
11. Aids and appliances, adaptive functional devices to improve neurological dysfunction
12. Inhibition and facilitation techniques
13. Exercise ECG testing and monitoring
14. Pulmonary function testing
15. Cardiovascular function disorders and principles of management, cardio respiratory function disorders and assessment
16. Physical disability evaluation and disability diagnosis. Gait analysis and diagnosis
PAPER III
PHYSIOTHERAPEUTICS

This paper consists of 4 Modules:
• Manual therapy
• Exercise therapy
• Electrotherapy
• Electrophysiology

Module I Manual Therapy
Part I Foundational concepts in Manual therapy
Unit
1. History of manual therapy
2. Biomechanical principles in manual therapy
   • Concave-Convex rule
   • Close pack and Loose pack Positions
   • Resting positions
   • Joint status
   • Barrier concepts
   • Fryette’s Laws
   • Articular neurology
3. Pain

Part II Joints Mobilization Techniques
(Terminology, Principles, Indications, Contra-indications, Assessment and method of application of the following techniques)
Unit
1. Kaltenborn
2. Maitland
3. Mulligan
4. McKenzie
5. Cyriax
6. Butler neural mobilization

Part III Soft Tissue Techniques and Recent Advances in Manual Therapy
(Terminology, Principles, Indications, Contra indications, Assessment and method of Application of the following techniques)
Unit
1. Myofascial release techniques
2. Muscle energy techniques
3. Trigger point release
4. High velocity thrust techniques
5. Positional release techniques
6. Lymphatic manipulations

**Recommended Books**

1. *Grieve's modern manual therapy: The vertebral column* By Jeffrey Boyling and Grad Dip Man Ther (Churchill Livingston)
2. *Concern manual therapy books*

**Module II Exercise Therapy**

**Part I Foundational Concepts**

**Unit**

1. Application of Disablement and Enablement models in therapeutic exercise
2. Principles of self management and exercise instruction
3. Prevention, health and wellness

**Part II Applied Science of Exercise and Techniques**

**Unit**

1. Range of motion
2. Stretching
3. Resisted exercise
4. Principles of aerobic exercise
5. Exercise for balance and posture
6. Aquatic exercises
7. Training with functional devices

**Part III Evidenced Based Clinical Applications of Exercise and Techniques**

**Recommended books**

3. *Therapeutic Exercise, Moving Towards Function* by Carrie M. Hall and Lori Thein Brody (Lippincott Williams & Wilkins, 2004)
Module III Electrotherapy
Part I Foundational Concepts in Electrotherapy
Unit
1. Bioscience of therapeutic electrical currents
   • Basic physics
   • Basic principles of electricity
   • Types of current
   • Classification of therapeutic electrical currents
   • Parameters of therapeutic electrical currents
2. Bioscience of therapeutic thermal modalities
   • Thermal physics
   • Bio physics
   • Basic principles of thermal agents
   • Classification of thermal agents
   • Parameters of thermal agents
3. Physiology
   • Electrical properties of tissues
   • Skin
   • Tissue repair and healing
   • Sensory and motor nerves
   • Pain
   • Circulatory system and edema
4. Physiological response to electrical stimuli
5. Physiological response to thermal stimuli
6. Clinical effects of electrical and thermal modalities
   • Soft tissue
   • Joints
   • Neuronal activity
   • Muscle performance
   • Visceral tissues
   • Abnormal tissues (Hematomas and malignant tumors)
7. Current concepts in electrotherapy

Part II. Thermal Modalities
Unit
1. Shortwave diathermy
2. Microwave diathermy
3. Infrared radiation
4. Ultrasound
5. Cryotherapy

Part III. Photo Chemical Agents
Unit
1. Laser
2. Ultra violet radiation

Part IV. Electrical Stimulation Modalities
Unit
1. Faradic current
2. Galvanic current
3. Neuromuscular electrical stimulation
4. Transcutaneous electrical nerve stimulation
5. Interferential therapy
6. Functional electrical stimulation
7. High voltage pulsed galvanic stimulation
8. Didynamic currents
9. Russian currents
10. Micro current therapy
11. Low intensity alternating current
12. Rebox
13. Ionotoporosis

Part V. Mechanical Modalities
Unit
1. Traction
2. Compression
3. Hydrotherapy

Part VI. Recent Advances in Electrotherapy
Unit
1. Shock wave therapy
2. Combination therapy
3. Long wave diathermy
4. Magneto therapy

Part VII. Evidence Based Clinical Application of Electrotherapeutics
Unit
1. Pain
2. Muscle strengthening and prevention of atrophy
3. Muscle spasm
4. Central nervous system lesions
5. Peripheral nervous system lesions
6. Edema and peripheral vascular dysfunctions
7. Wound healing
8. Pelvic floor dysfunctions
9. Obesity

**Recommended Books**
1. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2nd edition (Pearson prentice hall 2006)

**Module IV Electrophysiology**

**Part I Foundational Concept**

**Unit**
1. Historical perspective
2. Terminology
   • Electro diagnosis
   • Electro neuromyography (ENMG)
3. Effectiveness of electrical stimuli

**Part II Basic Physiology of Nerve and Muscles**

**Unit**
1. Membrane physiology
2. Muscle physiology
3. Nerve physiology
4. Physiological variables affecting electrophysiological tests

**Part III Instrumentation**

**Unit**
1. Components of electro diagnostic apparatus
2. Technical variables

**Part IV Principles of Electro Physiological Techniques**

**Unit**
1. Traditional methods
• Faradic galvanic test
• Strength duration test
• Chronaxie test
• Rheobase test
• Reaction of regeneration test
• Nerve excitability test

2. Recent Methods
Principles of NCS and EMG

Part V Evidence Based Application of Electrophysiological studies in Physiotherapy
Unit
1. Kinesiological electromyography
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2. EMG biofeedback
3. Application of traditional and contemporary techniques in Physiotherapy
4. Common parameters used in Physiotherapy research

Recommended books
4. The ABC of EMG: A practical introduction to Kinesiological electromyography by Peter Conrad (Noroxon Inc. USA 2005)
5. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2nd edition (Pearson prentice hall 2006)