

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 201physiotherapy 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)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5th edition (Charles C Thomas, 1977)
3. Joint Structure & Function :A comprehensive analysis by Cynthia C Norkin, Pamela K Levangie (Jaypee Brothers, 2006)
4. Brunnstrom's Clinical Kinesiology by Laura K. Smith & Don Lehmkuh, 5th edition (F A Davis, 1996)
5. The Physiology of the Joints by Kapandji & Matthew J Kendel (Churchill Livingstone, 2008)
6. Clinical Biomechanics of the Spine by Augustus A White & Manohar M Panjabi, 2nd Edition (Lippincott Williams & Wilkins; 1990)
7. Kinesiology :The mechanics and Pathomechanics of Human Movement by Carol Oatis (Lippincott Williams & Wilkins; 2008)
8. Kinesiology: Application to pathological motion by Soderberg, 2nd Edition (Wiliams & Wilkins, 1997)

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)
3. **Clinical Exercise Testing and Prescription Theory and Applications** by Scott O. Roberts, Peter Hanson (C RC Press, 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.
3. Developmental screening, development diagnosis, neurodevelopment assessment and motor learning – Voluntary control assessment.
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
7. Electro-diagnosis, clinical and kinesiological electromyography and evoked potential studies. Biophysical measurements, physiotherapy modalities, techniques and approaches. Electro-diagnosis, conventional methods, electromyography, sensory and motor nerve conduction velocity studies, spinal and somatosensory evoked potentials.
8. 14. ICDH 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
4. Pain

Part II Joints Mobilization Techniques

(Terminology, Principles, Indications, Contra-indications, Assessment and method of application of the following techniques)

Unit

1. Kalten born
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 Livingstone)
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

1. **Therapeutic Exercise: Treatment Planning for Progression** by Francis E. Huber, Christly. Wells (W.B. Saunders Company, 2006)
2. **Therapeutic Exercise: Foundations and Techniques** by Carolyn Kisner and Lynn Allen Colby (W.B. Saunders Company, 2007)
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. Ionotopporosis

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)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2nd edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

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

1. **Electromyography in clinical practice** by Michael J. Aminoff, 3rd edition (Churchill Livingstone)

2. **Clinical neurophysiology** by UK Misra and Kalita, 2nd edition (Churchill Livingstone)

3. **Electro diagnosis in diseases of nerve and muscle: Principles and practice** by Jun Kimura (Oxford university press)

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)