

**SYLLABUS**

**for Courses affiliated to the**

**Kerala University of Health Sciences**

**Thrissur 680596**



**MASTER OF PHYSIOTHERAPY (MPT)**

**IN**

**NEUROLOGY**

**Course Code: 294**

**(2016-17 Academic year onwards)**

**2016**

## 2. COURSE CONTENT

### 2.1 Title of course:

#### MASTER OF PHYSIOTHERAPY DEGREE (NEURO PHYSIOTHERAPY)

### 2.2 Objectives of course

The Master of Physiotherapy Program is directed towards rendering training in the Neuro Physiotherapy so as to enhance individual competence in order to fulfill requirement and to meet the global standards of Physiotherapy education and practice. Specific aims are:

1. To gain in knowledge of the human body related Basic Medical and Physiotherapeutic sciences relevant to Neuro Physiotherapy.
2. To gain in knowledge of movement dysfunction of human body and evidence based Physiotherapeutic management for movement dysfunction
3. To develop skills in Physiotherapy assessment pertaining to neurological disorders by relevant current physiotherapeutic concepts.
4. To plan and implement appropriate Physiotherapeutic intervention for all clinical conditions related to neurological disorders in acute and chronic phases, critical care, indoor and outdoor institutional care and independent practice.
5. To develop skills as a self-directed learner, recognize continuous education needs, select and use appropriate learning resources.
6. To develop ability to teach post graduate and undergraduate Physiotherapy students
7. To demonstrate managerial, administrative skills and legislation applicable to compensation for functional disability and appropriate certification
8. Acquainting a student with concept of quality of care at the institutional as well as the community levels.

### 2.3 Medium of instruction:

Medium of instruction and examinations shall be in English.

### 2.4 Course outline

The Masters Degree in Physiotherapy is a two year program consisting of classroom teaching, self directed academic learning activities, a research project and clinical postings. In the first year theoretical basis of fundamental Physiotherapy subjects are refreshed. In the second year, the students learn on the clinical conditions, physiotherapy assessment and advanced techniques in neurological disorders. During these two years, the students will be posted in



neurological and neurosurgical departments. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference and workshop to enhance their knowledge during their entire course of the study. University examinations are held at the end of second year. To fulfill their course completion, the students are required to complete and submit their dissertation on the research project.

## **2.5 Duration**

The duration of the course shall be two years.

## **2.6 Syllabus**

### **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. Research Methods**

##### **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

## 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
2. Lower extremity
3. Vertebral column
4. Thorax and chest wall
5. Temporo-mandibular joint

## **Part III Biomechanics of integrated function**

### **Unit:**

1. Gait
2. Posture
3. Arm as a whole

## **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
18. Work capacity analysis
19. Role of Physiotherapy in industrial set up
20. Workers functional capacity assessment
21. Industrial therapy
22. Educational programme for prevention of injury
23. Adult education
24. Injury prevention and ergonomics
25. Work capacity analysis
26. Role of Physiotherapy in industrial set up
27. Workers functional capacity assessment
28. Industrial therapy

29. Educational programme for prevention of injury

30. Adult education

31. Injury prevention and ergonomics

## **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

## **PAPER II 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. 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

### **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**

#### **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. Ionotoprosis

#### **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

## **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. Kinesiographical electromyography
2. EMG biofeedback
3. Application of traditional and contemporary techniques in Physiotherapy
4. Common parameters used in Physiotherapy research

### Paper III NEURO PHYSIOTHERAPY

#### This paper consists of 3 Modules:

- **Neuro Anatomy, Physiology and Clinical conditions**
- **Physical and functional assessment**
- **Physiotherapy interventions**

#### Module I Neuro Anatomy, Physiology and Clinical conditions

#### Part I Overview of Growth and Development of Nervous System

### Unit

1. Normal development of nervous system
2. Aging of nervous system

#### Part II Basic and Applied Neuro Anatomy

### Unit

1. Neuron
2. Neuroglia
3. Peripheral nerves
4. Spinal cord

5. Medulla
6. Pons
7. Midbrain
8. Cerebellum
9. Basal ganglia
10. Other Sub cortical structure
11. Cerebrum
12. Reticular and Limbic system
13. Autonomic nervous system
14. Ventricular system
15. Blood supply of the brain
16. Meninges
17. Special senses

### **Part III Basic Physiology and Applied Neuro Pathophysiology**

#### **Unit**

1. Basic components of the motor system: Cells and tissues
  - Excitable cell: their morphology and physiology
  - Skeletal muscle: the somatic effectors
  - The neuromuscular junction: the nerve /muscle interface
  - Basic sensory mechanisms and the somatosensory system
2. Control of motor activity: Systems that regulate and coordinate movement
  - Motor control at the spinal cord level
  - Brainstem and motor control
  - Cortical motor systems
  - Cerebellar mechanisms
  - Basal ganglia and their connections

- Limbic system
- Special senses
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#### Part IV Basic elements of Neuro Diagnostic Tests

##### Unit

1. CT Scan
2. MRI
3. Carotid angiography
4. Myelography
5. Nerve conduction velocity
6. Late responses
7. Electromyography
8. Evoked potential tests
9. Muscle and Nerve biopsy
10. CSF examination

#### Part V Common Clinical Manifestation of Neurological Disorders

##### Unit

1. Disorders of motor unit (Neuromuscular disease)
  - Muscle pain and tenderness
  - Muscle weakness
  - Changes in muscle mass
  - Muscle hyperactivity states
  - Muscle fatigability
  - Abnormal muscle tone (Hypotonic)
  - Abnormalities of sensation
  - Reduced or absent stretch reflexes
2. Disorders of central motor control

- Abnormal muscle tone
  - Muscle weakness
  - Loss of muscular endurance
  - Altered muscle activation patterns
  - Involuntary movements
  - Associated reactions
  - Abnormalities of coordination
  - Apraxia
  - Hypokinesia
  - Abnormal skeletal muscle reflexes
  - Abnormal balance
  - Abnormalities of sensation
3. Other associated manifestations
- Altered mental, cognitive and perceptual functions
  - Abnormalities in communications
  - Abnormalities in swallowing
  - Abnormalities of bladder and bowel functions

## Part VI Clinical Conditions

### Unit

1. Disorders of the motor unit (Neuromuscular diseases)
2. Disorders of muscle (Myopathies)
3. Myasthenia gravis and other disorders of neuromuscular transmission
4. Disorders of the peripheral nervous system
5. Disorders of the anterior horn cells (Neuronopathies)
6. Disorders of the central motor control
7. Disorders of the spinal cord
8. Parkinsonism and other movement disorders of the basal ganglia
9. Disorders of the cerebellum and its connection
10. Traumatic brain injury
11. Cerebrovascular disease (Stroke)
12. Multiple sclerosis and other central demyelinating diseases
13. Vestibular disorders
14. Cerebral palsy



15. Neural tube defects
16. Cranio - vertebral junction anomalies
17. Learning disorders Visual dysfunction
18. Cognitive and perceptual dysfunction
19. Adverse effects of immobilization on the musculoskeletal system
20. Adverse effects of immobilization on visceral function
21. Miscellaneous conditions

## **Module II Physical and functional Assessment**

### **Unit**

#### **I. Introduction to Physiotherapy Assessment**

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy verses medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Musculoskeletal
- Neuromuscular
- Cardiovascular/pulmonary
- Integumentary
- Today's health care model

#### **II. Influence of Psychological Factors on Rehabilitation**

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

### **III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment**

- Process of assessment
- Values and valuing
- Code of ethics
- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

### **IV. Examination of Functional Status and Activity Level**

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

### **V. Examination of Environment**

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety Adaptive equipment
- Assistive technology Examination of the workplace Community access Documentation
- Funding for environmental modifications Legislation

### **VI. Guideline for Physiotherapy Documentation**

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

### **VII. Disablement and Enablement Concepts for Physiotherapy Research and Practice**

- Traditional model
- Consequences of disease model
- NAGI model
- International Classification of Impairments Disability and Handicap Model (ICIDH – 1
- National Center for Medical Rehabilitation Research Model 1 &2 (NCMRR)
- Components of Health

- International Classification of Functioning, Disability and Health (ICF / ICIDH - 2)

### VIII. ICF Coding

- History and development of the ICF
- The ICF and the WHO family of international classifications
- Components of the ICF
- ICF coding
- Benefits of Using ICF

### IX. Evidence Based Practice

- Principles of evidence-based Physiotherapy practice
- Elements of evidence
- Appraising the evidence
- Evidence in practice

### Part X Physical Therapy Assessment Procedures Used in Neurological Conditions

#### Unit

1. Patient interview
  - Present medical history
  - Past medical history
  - Social history
2. Assessment of level of consciousness
  - Orientation
  - Response to stimuli
  - Level of consciousness
3. Assessment of cognitive function
  - Memory
  - Attention
  - Emotional response
  - Higher level cognitive abilities
4. Assessment of speech and communication
5. Assessment of cranial nerve integrity
6. Assessment of vital signs
7. Assessment of autonomic nervous system function
8. Assessment of sensory integrity
  - Superficial sensation
  - Proprioceptive (Deep) sensation
  - Combined cortical sensation
9. Assessment of perceptual function
  - Homonymous hemianopsia

- Body scheme and body image disorders
  - Spatial relation syndrome
10. Assessment of motor function
    - Muscle bulk and firmness
    - Muscle tone
    - Muscle Strength
    - Voluntary movement control (Stages of recovery, Synergy pattern, Associated reaction)
    - Muscle endurance
    - Fatigue
    - Involuntary movements
  11. Assessment of reflex integrity
    - Superficial reflexes
    - Deep tendon reflexes
    - Primitive or spinal reflexes
    - Tonic or brainstem reflexes
  12. Assessment of coordination
    - Gross motor coordination
    - Fine motor coordination
  13. Assessment of balance
    - Sensory integration or organization
    - Limits of stability (Steadiness and Maximum balance range)
    - Availability of postural synergies (Postural strategies)
    - Balance reactions
    - Static balance (Sitting and Standing)
    - Dynamic balance (Functional movement tasks, Dual tasks and BOS challenges)
  14. Assessment of posture
    - Head, neck and trunk alignment
    - Attitude of extremities
    - Symmetrical and asymmetrical posture (weight bearing)
  15. Gait analysis
    - Kinematic analysis
    - Kinetic analysis
  16. Upper limb control
    - Reach
    - Grasp
    - Manipulation
  17. Functional movement analysis

(Based on NDTA, Stages of Motor control, MRP, Task oriented and Brunnstrom's concepts)

a) Movement analysis of individual components of body

- Trunk movements in sitting
- Upper extremity movements
- Upper extremity weight bearing movements
- Lower extremity movements in sitting

- Lower extremity movements in standing
- Trunk and extremity movements in supine

b) Movement analysis of functional mobility skills (tasks)

- Initial activities in supine or side lying position
- Rolling
- Sidelying
- Prone activities
- Prone extension (pivot prone)
- Prone on elbows
- Quadruped (prone kneeling)
- Lower trunk activities
- Hook lying (crook lying)
- Bridging
- Sitting activities
- Sitting
- Kneeling activities
- Kneeling (kneel standing)
- Movement transitions into half kneeling
- Half kneeling
- Modified plantigrade activities
- Modified plantigrade
- Standing activities
- Standing
- Movement transitions
- Supine to sit
- Sit supine
- Sit stand

- Stand to sit
  - Gait activities
18. Functional capacity evaluation (FCE) for patients with neurological impairments
  19. Work conditioning and work hardening programs for patients with neurological impairments
  20. Assessment of patients with assistive devices
    - Ambulatory aids
    - Orthotics
    - Wheel chair
  21. Assessment of adverse effect of immobilization
    - Musculoskeletal
    - Visceral function

### **Module III Physiotherapy Interventions**

#### **Part I. Foundational Concepts in Neurological Physiotherapy**

##### **Unit**

1. History of neurological physiotherapy
2. Motor development concepts
3. Motor control and its clinical applications
4. Motor learning and its clinical applications
5. Recovery of function and neural plasticity
6. Conceptual framework for clinical practice
7. Constraints of motor control (Neurological impairments)
8. Interventions for neurological impairments
9. Psychological aspects of adaptation and adjustment during various phases of neurological disabilities
10. Principles of electro diagnosis (NCV, EMG, RNS and EP)

#### **Part II. Special Neuro Physiotherapeutic Approaches**

##### **Unit**

1. Traditional approaches

- Compensatory training approach
- Muscle reeducation approach
- Neuro physiological approaches

(Bobath, Brunnstrom, Roods, PNF, Sensory integration therapy and others)

## 2. Contemporary approaches

- Motor relearning programme
- Task oriented approach (Shumway cook)
- Novel approaches
- Constrained movement therapy
- Body weight supported treadmill training
- Functional electrical stimulation
- Neuro muscular electrical stimulation (NMES)
- Mirror box therapy
- Mental imagery technique
- Virtual reality therapy
- Robotic movement therapy (MAT)
- Bimanual approach
- Biofeedback
- Neuro dynamics in neurological conditions

## 3. Eclectic approach

### Part III. Physiotherapy Intervention for Neurological Conditions

#### Unit

#### 1. Disorders of the motor unit (Neuromuscular diseases)

- Disorders of muscle (Myopathies)
- Myasthenia gravis and other disorders of neuromuscular transmission
- Disorders of the peripheral nervous system
- Disorders of the anterior horn cells (Neuronopathies)

## 2. Disorders of the central motor control

- Disorders of the spinal cord
- Parkinsonism and movement disorders of the basal ganglia
- Disorders of the cerebellum and its connection
- Traumatic brain injury
- Cerebrovascular disease (Stroke)
- Multiple sclerosis and other central other central demyelinating diseases
- Vestibular disorders
- Cerebral palsy
- Neural tube defects
- Cranio - vertebral junction anomalies

## 3. Other conditions

- Learning disorders
- Visual dysfunction
- Cognitive and perceptual dysfunction
- Adverse effects of immobilization on the musculoskeletal system
- Adverse effects of immobilization on visceral function
- Miscellaneous conditions

## Part IV. Special Topics

### Unit

1. Vestibular rehabilitation
2. Pain management
3. Retraining of bladder and bowel dysfunctions
4. Management for oromotor dysfunctions
5. Visual deficits and its management
6. Myofascial release technique

7. Swiss ball therapy
8. Orthotics for neurological conditions
9. Alternative and complementary therapies

The concept of health care counseling shall be incorporated in all relevant areas.

## 2.7 Total number of hours

Total number of hours will be 3240 hours during the four years of study.

## 2.8 Branches if any with definition

## 2.9 Teaching learning methods

Teaching learning methods will include class room lectures, practical and laboratory demonstrations, and bed side clinical demonstrations by qualified faculty and self directed learning by the students through assignments, seminar and case presentations, journal clubs and research works under the faculty guidance.

## 2.10 Content of each subject in each year

As in 2.6 above

## 2.11 No: of hours per subject

Paper	Teaching and Learning Methods	Weekly class hours	Total hours
Paper I: Applied Basic Sciences Subjects: 1. Bio Statistics and Research Methodology 2. Biomechanics and Pathomechanics 3. Ergonomics 4. Nutrition and Exercise Physiology	Lectures	2	180
	Seminars	2	180
	Practicals and Demonstrations	4	360
	Clinical Discussions	2	180
	Clinical Case Presentations	2	180
Paper II: Physiotherapeutics Subjects: 1. Manual therapy 2. Exercise therapy 3. Electro therapy 4. Electrophysiology	Journal Club	2	180
	Class room teaching	1	90
	Library	3	270
	Clinical Training	15	1350
Paper III Neuro Physiotherapy			

Subjects: 1. Anatomy and Physiology 2. Clinical condition 3. Physiotherapy assessment 4. Foundational concepts and condition management 5. Special techniques			
Synopsis & Dissertation work			210
Community Camps, Field Visits, Participation in Workshops & Conferences	3		60
<b>TOTAL HOURS</b>	<b>36</b>		<b>3240</b>

### 2.12 Practical training

Practical training should be imparted under laboratory conditions for the basic science subjects with emphasis on carrying out the experiments and tests through demonstration by relevant faculty and repeated practice by the students. For physiotherapy assessment and treatment techniques these should be first demonstrated on human models and the students should practice on human models repeatedly until proficiency is gained. Later the techniques should be demonstrated on patients during bed side clinics and the students are encouraged to carry out the techniques on patients under supervision of faculty.

### 2.13 Records

In all subjects with practical components meticulous records should be kept regarding the topic of the practical training, procedure, materials and methods used, results and outcomes. The records should be submitted for inspection during practical or viva examination.

### 2.14 Dissertation: As per Dissertation Regulations of KUHS

### 2.15 Specialty training if any

### 2.16 Project work to be done if any

Not applicable

### 2.17 Any other requirements [CME, Paper Publishing etc.]

All students should attend at least two CME program each year preferably conducted in their own institution and two other conferences/workshops.

### 2.18 Prescribed/recommended textbooks for each subject

**Bio statistics, Research methodology**

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

### **Biomechanics and Pathomechanics**

1. Basic biomechanics of the musculoskeletal system by Margareta Nordin and Victor H. Frankle, 2<sup>nd</sup> edition ( Lea and Febiger)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5<sup>th</sup> 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, 2<sup>nd</sup> 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 (Williams & Wilkins, 1997)

### **Ergonomics**

1. Industrial Therapy by Glenda L. Key, 1<sup>st</sup> Edition (Mosby)

### **Nutrition and Exercise physiology**

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)

### **Manual Therapy**

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

### **Exercise Therapy**

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)

### **Electrotherapy**

1. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2<sup>nd</sup> edition (Pearson prentice hall 2006)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2<sup>nd</sup> edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

### **Electrophysiology**

1. Electromyography in clinical practice by Michael J. Aminoff, 3rd edition (Churchill Livingstone)
2. Clinical neurophysiology by UK Misra and Kalita, 2<sup>nd</sup> 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, 2<sup>nd</sup> edition (Pearson prentice hall 2006)

### **Clinical Neurology**

1. Text book of clinical neuroanatomy by Vishram singh (Elsevier 2007)
2. Clinical Neuroanatomy for Medical Students by Richard S Snell, 5<sup>th</sup> Edition (Lippincott Williams & Wilkins, 2001)
3. Neurophysiology by RHS Carpenter, 4<sup>th</sup> edition (Arnold 2003) Clinical neurology
4. Pathophysiology of the motor systems: Principles and Clinical presentations by Christopher M. Fredericks and Lisa K. Saladin (F.A. Davis Company 1996)
5. Brain's diseases of the nervous system by John Walton, 12<sup>th</sup> edition (Oxford University press)
6. A physiological approach to clinical neurology by James W. Lance and James G. McLeod, 3<sup>rd</sup> edition (Butterworth's 1981)

7. Muscle and its diseases: An outline primer of basic science and clinical methods by Irwin M. Siegel (Year book medical publishers 1986)
8. Neuroscience fundamental for rehabilitation by Laurie Lundy Ekman (W.B Saunders 1998)
9. Illustrated neurology and neuro surgery by Kenneth Lindsay and Ian Bone (Churchill Livingston, 2004)
10. Basic neurology by John Gilroy (Elsevier)

### **Physical and functional assessment**

1. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
2. Physical rehabilitation (4& 5<sup>th</sup> edition) by Susan B O Sullivan and Thomas J Schmitz. (Jaypee publication)
3. International Classification of Functioning, disability and health: Short version. (IT'S Publication)
4. Professionalism in physical therapy: History, Practice and Development by Laura Lee Swisher and Catherine G. Page, (Elsevier publication 2005)
5. Effective Documentation for Physical Therapy Professionals, by Eric Shamus and Debra (McGraw Hill company 2004)
6. Physical therapy Documentation: From examination to outcome by Mia Erickson, Ralph Utzman (Slack incorporated 2008)
7. Writing SOAP Notes with Patient / Client management Formats by Ginge Kettenbach, Ph. D., PT, 3<sup>rd</sup> Edition, 2004 ,F.A. DAVIS COMPANY. Philadelphia
8. Practical Evidence-Based Physiotherapy Rob Herbert, Gro Jamtvedt, Judy Mead, Kare Birger Hagen Elsevier Butter worth Heinemann; Oxford UK (2005)
9. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell, PT, PhD, Virginia Commonwealth University, Virginia
10. Hand book of neurologic rating scales by Robert M. Herndon, 2nd edition , (Demos publications 2005)
11. Bickerstaff's neurological examination in clinical practice by John Spillane, 6th edition (Blackwell science limited 1996)
12. Physical rehabilitation laboratory manual: Focus on functional training by Susan B O Sullivan and Thomas J Schmitz. (F.A. Davis Company)
13. The development of the infant young child: Normal and Abnormal by R.S. Illingworth, 9th edition (Churchill Livingstone 1996)

14. Functional Movement Reeducation – A contemporary model for stroke rehabilitation by Susan Ryerson and Kathryn Levit (Churchill Livingstone and Elsevier, 1997)

### **Physiotherapy Interventions**

1. Neurological rehabilitation by Darcy A. Umphred, 5th Edition, 2007 (Mosby Elsevier Publication.)
2. Physical management in neurological rehabilitation by Maria Stokes (Elsevier Mosby publication 2004)
3. Physiotherapy in neuro conditions by Gladys Samuel Raj (Jaypee Brothers 2006)
4. Spinal cord injury functional rehabilitation by Martha Freeman Somers, 2<sup>nd</sup> edition (Prentice Hall publication)
5. Physiotherapy in disorders of the brain : A clinical guide by Janet H. Carr and Roberta B. Shepherd (William Heinemann medical books limited)
6. Cash textbook of Neurology for physiotherapists by Patricia Downie, 4<sup>th</sup> edition (Jaypee Wolf 1992)
7. Neurologic interventions for physical therapy by Suzanne Tink Martin and Mary Kessler, 2<sup>nd</sup> edition (Saunders Elsevier)
8. Functional neurorehabilitation through the life span by Dolores B. Bertoti (F.A. Davis Company 2004)
9. Brunnstrom's movement therapy in hemiplegia: A neurophysiological approach by Kathryn A. Sawner and Jeanne M. La Vigne, 2nd edition (Lippincott Company 1992)
10. Motor control: Translating research into clinical practice by Anne Shumway - Cook and Marjorie Woollacott, 3rd edition (Lippincott Williams and Wilkins)
11. Neuro developmental treatment approach : theoretical foundations and principles of clinical practice by Janet M. Howle (NDTA 2002)
12. PNF in practice: Susan Adler
13. Vestibular rehabilitation by Susan J. Herdman, 2<sup>nd</sup> edition (F.A. Davis Company 2000)
14. Mobilization of the nervous system by David S. Butler (Churchill Livingstone 1996)
15. Myofascial release and NDT
16. Stroke Rehabilitation: Guidelines for exercise and training to optimize motor skill By Janet Carr and R. Shepherd (Elsevier, 2003)
17. Neurological Rehabilitation, Optimizing motor performance by Janet Carr and R. Shepherd (Butterworth and Heinemann Ltd, 2004)
18. Functional Movement Reeducation – A contemporary model for stroke Rehabilitation by Susan Ryerson and Kathryn Levitt (Churchill Livingstone and Elsevier, 1997)

19. A Motor Relearning Programme for Stroke by Janet Carr and R. Shepherd  
(Butterworth and Heinemann Ltd, Oxford Publication)

### **2.19 Reference books**

Same as 2.18

### **2.20 Journals**

1. Journal of Physical Therapy
2. Physiotherapy
3. Australian Journal of Physiotherapy
4. Indian Journal of Physiotherapy
5. Journal of Orthopaedics and Sports physiotherapy

### **2.21 Logbook**

Every student shall maintain a record of skills (Log book) he/she has acquired during each year of training period certified by the various heads of the department where he/she has undergone training. The Head of the department shall scrutinize the log book once in every three months. At the end of each year, the candidate should summarize the contents and get the log book certified by the Head of the Institution.

## **3. EXAMINATIONS**

### **3.1 Eligibility to appear for exams**

There shall be 80% attendance in theory and practical/clinical separately to appear for the University examination. The candidate must secure the minimum marks of 50% in internal assessment in theory and practical in a particular subject in order to be eligible to appear in the university examination of the subject.

### **3.2 Schedule of Regular/Supplementary exams**

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time.

Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of publication of results of regular examination.

### 3.3 Scheme of examination showing maximum marks and minimum marks

SUBJECT	THEORY		THEORY INTERNAL		PRACTICAL		PRACTICAL INTERNAL		VIVAS		TOTAL	
	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Max Marks
Paper I Applied Basic Sciences	100	50	50	25	***	***	***	***	***	***	150	75
Paper II Physiotherapeutics	100	50	50	25	100	50	50	25	50	25	350	175
Paper III Neuro Physiotherapy	100	50	50	25	100	50	50	25	50	25	350	175
Dissertation	APPROVED/NOT APPROVED								100	50	100	50

### 3.4 Papers in each year

As in 3.2

### 3.5 Details of theory exams

#### Question paper pattern for MPT theory examination

Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	20
Brief structured essay	10	6

### BROAD GUIDELINES

Paper	Subjects		Distribution of marks	Total marks
Paper I Applied Basic Sciences	1	Bio Statistics and Research Methodology	30	100
	2	Biomechanics and Pathomechanics	30	
	3	Ergonomics	10	
	4	Nutrition and Exercise Physiology	30	
Paper II Physiotherapeutics	1	Manual therapy	25	100
	2	Exercise therapy	25	
	3	Electro therapy	25	
	4	Electrophysiology	25	
Paper III(Speciality)	1.	Anatomy and Physiology	15	



Physiotherapy assessment	2.	Clinical Neurology	15	100
	3.	Physical and functional diagnosis	30	
	4.	Physiotherapy interventions	40	

Structured Essay should be explanatory and brief structured Essay should be descriptive.

### 3.6 Model question paper for each subject with question paper pattern

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

#### PAPER I – APPLIED BASIC SCIENCES

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

#### I. Long Essay (2 x 20 = 40 marks)

1. Explain in detail about the functional adaptation of bone under pathological conditions.
2. Discuss about exercise in different altitudes and various climatic conditions.

#### II. Short notes: (10 x 6 = 60 marks)

1. Back care for physiotherapist in clinics
2. Job analysis
3. Energy expenditure during walking and running
4. Ergonomic modifications for a software professional
5. DOMS
6. Plyometrics
7. Pre-competition meal
8. Hallux valgus
9. Methods of sampling
10. Hypothesis testing

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

#### PAPER II – PHYSIOTHERAPEUTICS

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**



**I. Long Essay (2 x 20 = 40 marks)**

1. Describe the types of Mckenzie's syndromes, use of repeated movements in Mckenzie's method of spinal examination and explain the treatment principles for derangement syndrome
2. Explain in detail the neurophysiological principles and treatment principles of proprioceptive neuromuscular facilitation techniques. Describe about various proprioceptive neuromuscular facilitation techniques to improve stability

**II. Short notes (10 x 6 = 60 marks)**

1. Neural mobilization
2. EMG changes in peripheral neuropathies
3. Principles of Muscle Energy Techniques
4. Concave-convex rule and its importance in manipulation
5. Russian currents
6. Iontophoresis
7. Pain assessment
8. Functional Electrical Stimulation
9. Skin fold measurement
10. Close pack and loose pack position

**MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION**

**NEURO PHYSIOTHERAPY**

**Q.P. Code:**

**Time: Three Hours  
marks**

**Maximum: 100**

**Answer ALL questions**

**I. Long Essay (2 x 20 = 40 marks)**

1. Enumerate the clinical signs and symptoms of cerebellar lesion and its PT Assessment.
2. Define motor control. Describe about the various factors affecting the motor control and enumerate upon the various theories of motor control

**II. Short notes (10 x 6 = 60 marks)**

1. Apraxia
2. Assistive device for cerebral palsy
3. Biofeedback in gait training
4. Rancho Los amigo scale.
5. Task Oriented Approach
6. Pain gate theory

7. Different mechanisms of sports injury.
8. Body supported treadmill training
9. Motor Nerve Conduction Study
10. Myasthneia gravis

### **3.7 Internal assessment component**

- a. There shall be a minimum of 3 periodic assessments, for theory and practical including viva separately, of which the final one shall be in the KUHS pattern and is mandatory.
- b. Average of the marks of the KUHS pattern examination and the best out of the remaining periodical assessments shall be taken as internal assessment mark of the candidate
- c. The class average of internal assessments mark of theory and practical should not exceed 75% of Maximum marks
- d. The class average of internal assessment for an examination shall be calculated based on the total number of candidates in a particular batch appearing for that internal assessment examination.
- e. The candidate must secure the minimum marks of 40% for internal assessment in theory, practical and viva voce in a particular subject order to be eligible to appear in the university examination of the subject.

### **3.8 Details of practical/clinical practicum exams**

#### **PRACTICAL 1 - Physiotherapeutics**

(Practical exam is emphasized only on Exercise and Electrotherapy)

- One long case - 60 marks
- One short case - 40 marks
- Viva - 50 marks

#### **PRACTICAL 2 – Neuro Physiotherapy**

(Practical exam is emphasized only on Physiotherapy assessment and Interventions)

- One long case - 60 marks
- One short case - 40 marks
- Viva - 50 marks

### **3.9 Number of examiners (Internal & External) and their qualifications**

There will be two examiners for each subject where practical/ or viva to be conducted. One examiner (INTERNAL EXAMINER) is preferably from the same institution or as decided by the

KUHS and the other examiner will be from another university (EXTERNAL EXAMINER). The examiners should have at least 5 years of teaching experience after post graduation.

**3.10 Details of viva:**

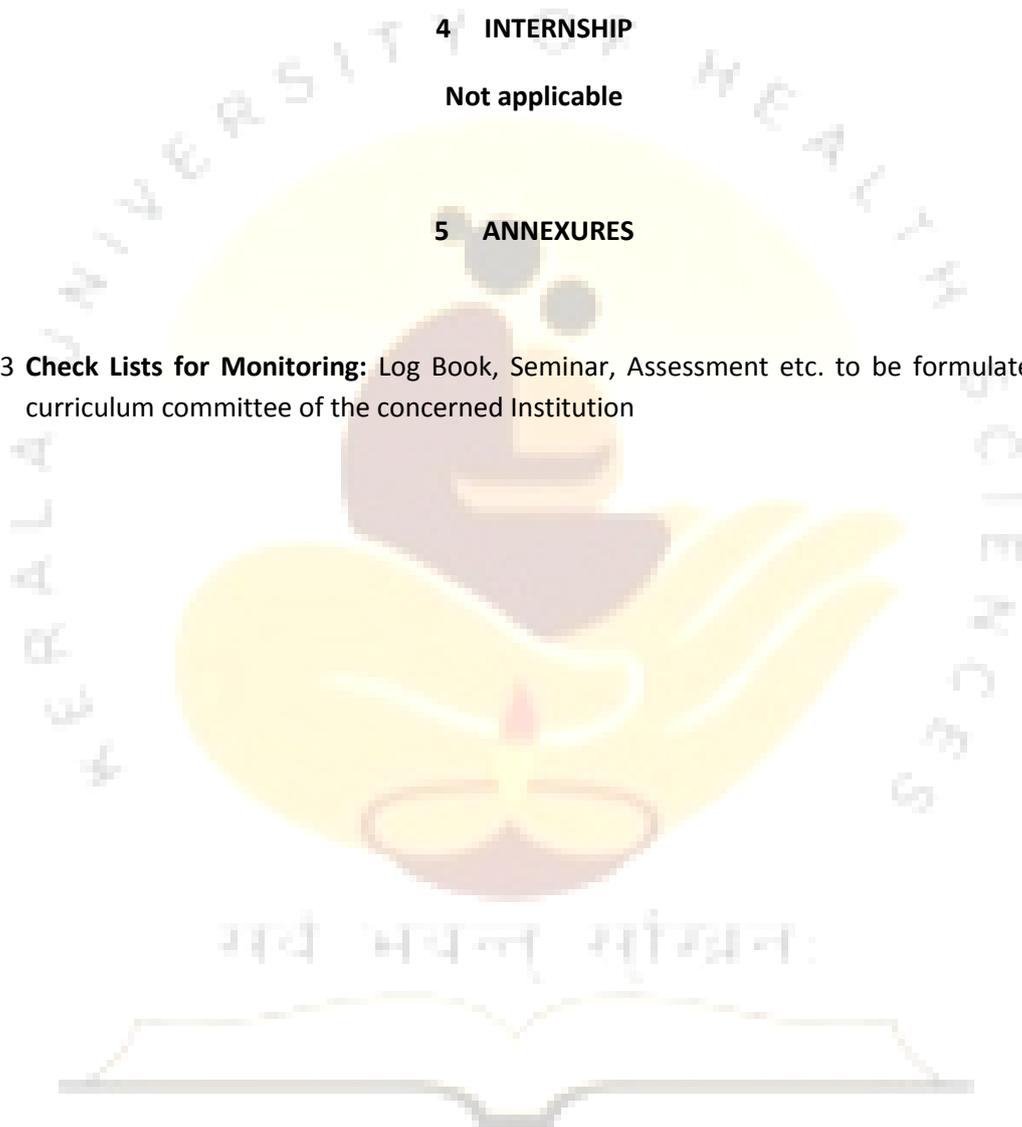
Wherever viva is prescribed the same will be conducted by the internal and external examiners appointed for practical examinations.

**4 INTERNSHIP**

Not applicable

**5 ANNEXURES**

5.3 **Check Lists for Monitoring:** Log Book, Seminar, Assessment etc. to be formulated by the curriculum committee of the concerned Institution



**SYLLABUS**

**for Courses affiliated to the**

**Kerala University of Health Sciences**

**Thrissur 680596**



**MASTER OF PHYSIOTHERAPY (MPT)**

**IN**

**MUSCULO SKELETAL AND SPORTS**

**Course Code: 296**

**(2016-17 Academic year onwards)**

**2016**

## 2. COURSE CONTENT

### 2.1 Title of course:

**MASTER OF PHYSIOTHERAPY DEGREE (MUSCULOSKELETAL AND SPORTS PHYSIOTHERAPY)**

### 2.2 Objectives of course

The Master of Physiotherapy Program is directed towards rendering training in Musculoskeletal and Sports Physiotherapy so as to enhance individual competence in order to fulfill requirement and to meet the global standards of Physiotherapy education and practice. Specific aims are:

1. To gain in knowledge of the human body related Basic Medical and Physiotherapeutic sciences relevant to Musculoskeletal and Sports Physiotherapy.
2. To gain in knowledge of movement dysfunction of human body and evidence based Physiotherapeutic management for movement dysfunction
3. To develop skills in Physiotherapy assessment pertaining to musculoskeletal disorders and sports by relevant current physiotherapeutic concepts.
4. To plan and implement appropriate Physiotherapeutic intervention for all clinical conditions related to musculoskeletal disorders and sports in acute and chronic phases, critical care, indoor and outdoor institutional care and independent practice.
5. To develop skills as a self-directed learner, recognize continuous education needs, select and use appropriate learning resources.
6. To develop ability to teach post graduate and undergraduate Physiotherapy students
7. To demonstrate managerial, administrative skills and legislation applicable to compensation for functional disability and appropriate certification
8. Acquainting a student with concept of quality of care at the institutional as well as the community levels.

### 2.3 Medium of instruction:

Medium of instruction and examinations shall be in English.

## 2.4 Course outline

The Masters Degree in Physiotherapy is a two year program consisting of classroom teaching, self directed academic learning activities, a research project and clinical postings. In the first year theoretical basis of fundamental Physiotherapy subjects are refreshed. In the second year, the students learn on the clinical conditions, physiotherapy assessment and advanced techniques in musculoskeletal disorders and sports. During these two years, the students will be posted in musculoskeletal disorders and sports departments. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference and workshop to enhance their knowledge during their entire course of the study. University examinations are held at the end of second year. To fulfill their course completion, the students are required to complete and submit their dissertation on the research project.

## 2.5 Duration

The duration of the course shall be two years.

## 2.6 Syllabus

### 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. Research Methods

##### 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

## **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
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

### 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
18. Work capacity analysis
19. Role of Physiotherapy in industrial set up
20. Workers functional capacity assessment

21. Industrial therapy
22. Educational programme for prevention of injury
23. Adult education
24. Injury prevention and ergonomics
25. Work capacity analysis
26. Role of Physiotherapy in industrial set up
27. Workers functional capacity assessment
28. Industrial therapy
29. Educational programme for prevention of injury
30. Adult education
31. Injury prevention and ergonomics

#### **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

## **PAPER II 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. 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

## **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**

### **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. Ionotoprosis

### 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

## **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
2. EMG biofeedback
3. Application of traditional and contemporary techniques in Physiotherapy
4. Common parameters used in Physiotherapy research

### **Paper III MUSCULOSKELETAL AND SPORTS PHYSIOTHERAPY**

This paper consists of 3 Modules:

- **Musculoskeletal Anatomy, Physiology and Clinical conditions**
- **Physical and functional assessment**
- **Physiotherapy interventions**

#### **Module I Musculoskeletal Anatomy, Physiology and Clinical conditions**

##### **Part I Fundamentals in Musculoskeletal and Sports**

###### **Unit**

1. Embryological development, Growth & maturation of musculoskeletal system
2. Healing of muscle, tendon and ligament injuries
3. Pathomechanics of bone, joint & soft tissue injuries
4. Basic exercise physiology - Physiological responses and adaptations to Exercise in central nervous, musculoskeletal, cardio respiratory, sensory, Autonomic nervous and endocrine systems

##### **Part II Clinical Orthopedics and Sports**

###### **Unit**

###### **1. General musculoskeletal disorders**

- Congenital malformations & deformities
- Developmental disorders of bone
- Infections of bone & joints
- Tumors of the musculoskeletal system
- Neuro muscular disorders
- Nerve injuries
- Soft tissue injuries including burns

- Spinal deformities
- Metabolic and endocrine disorders
- Degenerative joint disorders & arthritis
- Regional conditions of upper, lower limb & spine
- Amputation

## 2. Fractures and Dislocations

- Introduction to fractures of bone & joints and classification of fractures
- Introduction to dislocation & recurrent dislocations of Joints
- Fractures & dislocations of upper limb
- Fractures & dislocations of lower Limb
- Fractures & dislocations of spine
- Fractures of pelvis

## 3. General principles of Orthopaedic surgery

- Arthrodesis
- Osteotomy
- Arthroplasty
- Bone grafting
- Internal and external fixations
- Distraction and limb reconstruction
- Correction of bone deformities and joint contractures.
- Tendon transfers
- Nerve suturing and grafting.
- Wound debridement
- Orthopaedic implants

## 4. Clinical Conditions related to sporting emergencies:

### Injuries of:

- Head, face and neck

- Shoulder
- Elbow, forearm, wrist and hand
- Trunk (Hip, Spine and Ribs)
- Internal (Abdominal/Thoracic)
- Knee and thigh
- Lower leg, ankle and foot
- Epiphysis
- Skeletally immature athletes, female athletes and differently abled
- Injuries Related to Specific Sports - E.g. Foot Ball, Volley Ball, Basket Ball, Swimming etc.

## **Module II Physical and functional Assessment**

### **Unit**

#### **I. Introduction to Physiotherapy Assessment**

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy verses medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Musculoskeletal
- Neuromuscular
- Cardiovascular/pulmonary
- Integumentary
- Today's health care model

#### **II. Influence of Psychological Factors on Réhabilitation**

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation

- Suggestions for rehabilitative interventions

### **III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment**

- Process of assessment
- Values and valuing
- Code of ethics
- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

### **IV. Examination of Functional Status and Activity Level**

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

### **V. Examination of Environment**

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety Adaptive equipment
- Assistive technology Examination of the workplace Community access Documentation
- Funding for environmental modifications Legislation

### **VI. Guideline for Physiotherapy Documentation**

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

### **VII. Disablement and Enablement Concepts for Physiotherapy Research and Practice**

- Traditional model
- Consequences of disease model
- NAGI model
- International Classification of Impairments Disability and Handicap Model (ICIDH – 1
- National Center for Medical Rehabilitation Research Model 1 &2 (NCMRR)

- Components of Health
- International Classification of Functioning, Disability and Health (ICF / ICIDH - 2)

### **VIII. ICF Coding**

- History and development of the ICF
- The ICF and the WHO family of international classifications
- Components of the ICF
- ICF coding
- Benefits of Using ICF

### **IX. Evidence Based Practice**

- Principles of evidence-based Physiotherapy practice
- Elements of evidence
- Appraising the evidence
- Evidence in practice

### **X Musculoskeletal and sports Assessment**

**(A)** General Orthopaedic Physiotherapy assessment procedures which includes, Demographic data collection, History, Observatory, Palpatory & examination findings which includes the assessment of pain, Motor examination, Joint laxity, Sensory examination, Posture and Gait evaluation and Other relevant system E.g. Cardio respiratory / Neurological examination methods along with disease specific / joint specific/ soft tissue specific tests assigned according to its sensitivity & specificity and obtaining a Physiotherapy assessment)

### **(B) Basic skills of physical & functional and sports specific assessment of various sports injuries**

- 1. Pre participation evaluation**
- 2. Orientation to investigatory procedures in Orthopedics and Sports**
  - Basics of X-ray and views taken
  - Basics of CT Scan
  - Basics of MRI Scan
  - Basics of biopsy procedures
  - Basics of critical care Investigatory procedures
  - Basics of electromyography & interpretation
  - Basics of isokinetic testing

## **Module III Physiotherapy Interventions**

### **Part I Fundamental concepts**

## Unit

- **Basic Skills in Orthopaedic Physiotherapy evaluative procedures**
- **Physical assessment including relevant investigations of musculoskeletal System and appropriate outcome measures.**
- **Evidence based practice**

## Part II Physiotherapy Management Procedures

### Unit

#### 1. General musculoskeletal disorders

- Congenital malformations & deformities
- Developmental disorders of bone
- Infections of bone & joints
- Tumors of the musculoskeletal system
- Neuro muscular disorders
- Nerve injuries
- Soft tissue injuries including burns
- Spinal deformities
- Metabolic and endocrine disorders
- Degenerative joint disorders & arthritis
- Regional conditions of upper, lower limb & spine
- Amputation

#### 2. Fractures & Dislocations

- Fractures & dislocations of upper limb
- Fractures & dislocations of lower Limb
- Fractures & dislocations of spine
- Fractures of pelvis

#### 3. Importance of orthosis, prosthesis & mobility aids in musculoskeletal problems

- Orthoses & mobility aids – materials, designs and biomechanical compatibility.
- Applied mechanics in the application of prostheses

- Procedures in prosthetic & orthotic fabrication of temporary splints for face, upper & lower Limb for support, prevention of deformities & Functional training.

#### 4. Special approaches in Musculoskeletal and Sports physiotherapy:

- Physiological and accessory movements, biophysics of contractile and non contractile tissues, response to mechanical loading. .
- History of manual therapy. Overview of various manual therapy approaches for all the skeletal joints.
- Principles and application of different soft tissue mobilizations like Myofascial Techniques, Neural Tissue Mobilization, Muscle Energy Technique etc.
- Pilates-school of thought, Chiropractic school of thought, Osteopathic school of thought
- Yoga Based Therapeutics
- Joint manipulation – peripheral joints and vertebral joints.
- Neuromuscular Taping techniques
- Advances in the field of manual medicine
- Proprioceptive Neuromucular Facilitation Techniques
- Soft tissue and Sports massage
- Core stability exercises – Pilates, Swiss ball exercises, Stabilization exercises
- Therapeutic exercise prescription
- Plyometric training
- Eccentric muscle training
- Proprioceptive training
- Muscle training and conditioning program
- Stretching
- Principles of injury prevention
- Athletic emergency care and first aid
- Protective and supportive equipments
- Individualized treatment programmes, protocols, preventive exercises, conditioning exercises, taping and wrapping techniques used for sports specific injuries

#### 5. Special topics

- Classification of sports specific injuries and its management
- Community based rehabilitation for musculoskeletal disorders
- Ergonomics in musculoskeletal dysfunctions with special emphasis to industrial safety.
- Understanding of disability & its compensation strategies
- Emergency care & musculoskeletal therapeutics
- Role of Physiotherapist as a member in disaster management team.
- Recent advances in pain evaluation & physiotherapy management.
- Team Approach of Physiotherapy management In poly trauma
- Home program & counseling of care givers
- Nutrition, pharmacology and psychology in sports
- Sports specific fitness training
- Ergonomics for sports
- Fitness testing and evaluation
- Fitness programming for healthy adults and special population

The concept of health care counseling shall be incorporated in all relevant areas.

### 2.7 Total number of hours

Total number of hours will be 3240 hours during the four years of study.

### 2.8 Branches if any with definition

### 2.9 Teaching learning methods

Teaching learning methods will include class room lectures, practical and laboratory demonstrations, and bed side clinical demonstrations by qualified faculty and self directed learning by the students through assignments, seminar and case presentations and project works under the faculty guidance.

### 2.10 Content of each subject in each year

As in 2.6 above

### 2.11 No: of hours per subject

Paper	Teaching and Learning Methods	Weekly class hours	Total hours
Paper I: Applied Basic Sciences	Lectures	2	180

Subjects:	Seminars	2	180
1. Bio Statistics and Research Methodology	Practicals and Demonstrations	4	360
2. Biomechanics and Pathomechanics	Clinical Discussions	2	180
3. Ergonomics	Clinical Case Presentations	2	180
4. Nutrition and Exercise Physiology	Journal Club	2	180
Paper II: Physiotherapeutics	Class room teaching	1	90
Subjects:	Library	3	270
1. Manual therapy	Clinical Training	15	1350
2. Exercise therapy			
3. Electro therapy			
4. Electrophysiology			
Paper III Musculoskeletal and sports Physiotherapy			
Subjects:			
1. Anatomy and Physiology			
2. Clinical condition			
3. Physiotherapy assessment			
4. Foundational concepts and condition management			
5. Special techniques			
Synopsis & Dissertation work			210
Community Camps, Field Visits, Participation in Workshops & Conferences	3		60
TOTAL HOURS	36		3240

### 2.12 Practical training

Practical training should be imparted under laboratory conditions for the basic science subjects with emphasis on carrying out the experiments and tests through demonstration by relevant faculty and repeated practice by the students. For physiotherapy assessment and treatment techniques these should be first demonstrated on human models and the students should practice on human models repeatedly until proficiency is gained. Later the techniques should be demonstrated on patients during bed side clinics and the students are encouraged to carry out the techniques on patients under supervision of faculty.

### **2.13 Records**

In all subjects with practical components meticulous records should be kept regarding the topic of the practical training, procedure, materials and methods used, results and outcomes. The records should be submitted for inspection during practical or viva examination.

### **2.14 Dissertation: As per Dissertation Regulations of KUHS**

### **2.15 Specialty training if any**

### **2.16 Project work to be done if any**

Not applicable

### **2.17 Any other requirements [CME, Paper Publishing etc.]**

All students should attend at least two CME program each year preferably conducted in their own institution and two other conferences/workshops.

### **2.18 Prescribed/recommended textbooks for each subject**

#### **Bio statistics, Research methodology**

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

#### **Biomechanics and Pathomechanics**

1. Basic biomechanics of the musculoskeletal system by Margareta Nordin and Victor H. Frankle, 2<sup>nd</sup> edition ( Lea and Febiger)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5<sup>th</sup> 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, 2<sup>nd</sup> 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 (Williams & Wilkins, 1997)

## **Ergonomics**

1. Industrial Therapy by Glenda L. Key, 1<sup>st</sup> Edition (Mosby)

## **Nutrition and Exercise physiology**

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)

## **Manual Therapy**

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

## **Exercise Therapy**

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)

## **Electrotherapy**

1. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2<sup>nd</sup> edition (Pearson prentice hall 2006)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2<sup>nd</sup> edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

## **Electrophysiology**

1. Electromyography in clinical practice by Michael J. Aminoff, 3rd edition (Churchill Livingstone)
2. Clinical neurophysiology by UK Misra and Kalita, 2<sup>nd</sup> 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, 2<sup>nd</sup> edition (Pearson prentice hall 2006)

### **Clinical Orthopedics and Sports**

1. Essentials of Orthopedics for Physiotherapists by John Ebenezer – Jaypee Publications
2. Practical Fracture Treatment by Ronald McRae, Max Esser – Churchill Livingston
3. Oxford Textbook of Orthopaedic & Trauma by Christopher Bulstrode, Joseph Buckwalter – Oxford University Press
4. Campbell's operative orthopedics. - By S. Terry Canale, James H. Beaty - Mosby
5. Fractures & joint injuries By Watson Jones – Churchill Livingston
6. Clinical Orthopaedic Examination by Ronald McRae – Churchill Livingstone
7. Daniels and Worthingham's muscle testing: Techniques of manual examination By Helen J Hislop, Jacqueline Montgomery Barbara – Elsevier
8. Muscles – Testing and Function by Florence Peterson Kendall – Lippincott
9. Joint Range of Motion and Muscle length testing By Nancy Berryman Reese - Saunders
10. Orthopedic Physical Assessment, By David J. Magee, PhD, BPT - Saunders
11. Illustrated Orthopedic Physical Assessment, 3e By Ronald C. Evans, - Mosby
12. Diagnostic Imaging for Physical Therapists by James Swain, Kenneth W. Bush, and Juliette Brosing – Elsevier
13. Differential Diagnosis for Physical Therapists: Screening for Referral, By Catherine C. Goodman, and Teresa Kelly Snyder – Saunders
14. Gait Analysis : Theory And Application By Rebecca Craik and Carol A Oatis – Mosby

### **Physical and functional assessment**

1. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
2. Physical rehabilitation (4& 5<sup>th</sup> edition) by Susan B O Sullivan and Thomas J Schmitz. (Jaypee publication)
3. International Classification of Functioning, disability and health: Short version. (IT'S Publication)
4. Professionalism in physical therapy: History, Practice and Development by Laura Lee Swisher and Catherine G. Page, (Elsevier publication 2005)

5. Effective Documentation for Physical Therapy Professionals, by Eric Shamus and Debra (McGraw Hill company 2004)
6. Physical therapy Documentation: From examination to outcome by Mia Erickson, Ralph Utzman (Slack incorporated 2008)
7. Writing SOAP Notes with Patient / Client management Formats by Ginge Kettenbach, Ph. D., PT, 3<sup>rd</sup> Edition, 2004 ,F.A. DAVIS COMPANY. Philadelphia
8. Practical Evidence-Based Physiotherapy Rob Herbert, Gro Jamtvedt, Judy Mead, Kare Birger Hagen Elsevier Butter worth Heinemann; Oxford UK (2005)
9. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell, PT, PhD, Virginia Commonwealth University, Virginia
10. Concern Specialty books for physical therapy assessment and outcome measures

### **Physiotherapy Interventions**

1. Skeletal Growth and development: Clinical issues and basic science advances. The Symposium Series by Joseph A Buckwalter – AAOS
2. Introduction to Physical Therapy, By Michael A. Pagliarulo - Mosby
3. Kinesiology: The mechanics and Pathomechanics of Human Movement by Carol A Oatis - Lippincott
4. Cash Text Book for Orthopedics and rheumatology for physiotherapist by John Elizabeth Cash & Patricia A Downie – Lippincott
5. Joint Mobilization / Manipulation: Extremity and Spinal Techniques by Susan L Edmond – Mosby
6. Foundations of Chiropractic by Meridel I Gatterman – Mosby
7. Grieve's Modern Manual Therapy: The Vertebral Column, By Jeffrey Boyling and Gwendolen Jull – Churchill Livingston
8. Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation, By Donald A. Neumann, PhD, PT – Mosby
9. Maitland's Peripheral Manipulation, By Elly Hengeveld, and Kevin Banks, - Butterworth-Heinemann
10. Maitland's Vertebral Manipulation, By Geoff D. Maitland, - Butterworth-Heinemann
11. Hand and Upper Extremity Rehabilitation: A Practical Guide, By Susan L. Burke, - Churchill Livingston
12. Manual Therapy for the Peripheral Nerves B y Jean-Pierre Barral, DO(UK) and Alain Croibier, Osteopathe DO, MRO (F) – Churchill Livingston

13. Neuromuscular Rehabilitation in manual and physical therapies: Principles and Practice by Eyal Lederman – Churchill Livingston
14. Orthopaedic Physical therapy Secrets by Jeffrey D Place - Elsevier
15. Principles and Practice of orthopedics and sports medicine by Garret
16. A Physiotherapist's Guide to Clinical Measurement by John Edward Fox, and Richard Jasper Day – Elsevier
17. Orthotics and Prosthetics in Rehabilitation, By Michelle M. Lusardi, PhD, PT and Caroline C. Nielsen, PhD - Butterworth-Heinemann
18. Clinical Application of Neuromuscular Techniques: The Upper Body by Leon Chaitow, and Judith DeLany, - Elsevier
19. Handbook of Postsurgical Rehabilitation Guidelines for the Orthopedic Clinician By Hospital for Special Surgery – Mosby
20. An Illustrated Guide to Taping Techniques – Principles & Practice By Thomas John Hewetson – Mosby
21. Paraplegia & Tetraplegia A Guide for Physiotherapists by Ida Bromley – Churchill Livingston
22. Therapeutic exercises using swiss ball By Caroline corning creager – Executive Physical therapy
23. Manual Mobilization of the Joints – The Kaltenborn Method Volume I, II By Freddy kaltenborn
24. Treat your own Back by Robin Mckenzie
25. Treat your own Neck by Robin Mckenzie
26. Cervical and Thoracic spine : Mechanical Diagnosis & Therapy Vol I & II By Robin Mckenzie
27. The Lumbar Spine: Mechanical Diagnosis & Therapy Vol I & II By R obin Mckenzie
28. The Human Extremities: Mechanical Diagnosis & Therapy by Robin Mckenzie
29. Manual Therapy by Brain R Mulligan
30. Clinical Orthopaedic Rehabilitation by S Brent Brotzman
31. Treatment and rehabilitation fractures by Vasantha L Moorthy & Stanley Hoppenfield - Lippincott
32. Physiotherapy for Amputees: The Roehampton Approach by Barbara Engstrom – Churchill Livingston
33. Textbook of orthopedic medicine Vol I & II by James Cyriax - Bailliere
34. Orthopedic Sports Medicine, Delee Drez Miller, 3<sup>rd</sup> edition: 2009, Saunders Elsevier Sports Physiotherapy, Maria Zuluaga, Christopher Briggs, John Carlisle.

35. Sports Injury Assessment and Management, David C Reid.
36. Orthopedic and sports physical therapy, Terry R. Macone: 3<sup>rd</sup> edition, 1997: Mosby.
37. Post surgical orthopedic sports rehabilitation knee and shoulder , Robert C. Maske: 2006: Mosby Elsevier.
38. Sports injuries diagnosis and management , Christopher N. Norris: 2<sup>nd</sup> & 3<sup>rd</sup> edition: 1998: BH.
39. Sports medicine secrets, Hanley and beltors, 2<sup>nd</sup> edition: 2001: jaypee.
40. Sports injuries prevention and their treatment, Lass Peterson: 1<sup>st</sup> edition: 2001: Martin dunitz.
41. Sports medicine problem and practical management, Eugene sherry, 1<sup>st</sup> edition: 1997: GMM.
42. Exercise and sports science, Garrett, Kirkendall: 2000: Lippincott Williams and Wilkins.
43. ACSM'S essentials of sports medicine, Robert E. salhi, fredy massimino: 1997: Mosby.
44. Sports medicine in primary care , Rob jonson M.D: 2000: saunders company.
45. Documentation for Rehabilitation: A Guide to Clinical Decision Making, By Lori Quinn, and James Gordon – Saunders

#### **2.19 Reference books**

Same as 2.18

#### **2.20 Journals**

1. Journal of Physical Therapy
2. Physiotherapy
3. Australian Journal of Physiotherapy
4. Indian Journal of Physiotherapy
5. Journal of Orthopaedics and Sports physiotherapy

#### **2.21 Logbook**

Every student shall maintain a record of skills (Log book) he/she has acquired during each year of training period certified by the various heads of the department where he/she has undergone training. The Head of the department shall scrutinize the log book once in every three months. At the end of each year, the candidate should summarize the contents and get the log book certified by the Head of the Institution.

### 3. EXAMINATIONS

#### 3.1 Eligibility to appear for exams

There shall be 80% attendance in theory and practical/clinical separately to appear for the University examination. The candidate must secure the minimum marks of 50% in internal assessment in theory and practical in a particular subject in order to be eligible to appear in the university examination of the subject.

#### 3.2 Schedule of Regular/Supplementary exams

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time.

Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of publication of results of regular examination.

#### 3.3 Scheme of examination showing maximum marks and minimum marks

SUBJECT	THEORY		THEORY INTERNAL		PRACTICAL		PRACTICAL INTERNAL		VIVA		TOTAL	
	Max Marks	Min. Marks	Max Marks	Min. Marks	Max Marks	Min. Marks	Max Marks	Min. Marks	Max Marks	Min. Marks	Max Marks	Min. Marks
Paper I Applied Basic Sciences	100	50	50	25	***	***	***	***	***	***	150	75
Paper II Physiotherapeutics	100	50	50	25	100	50	50	25	50	25	350	175
Paper III Musculoskeletal and Sports Physiotherapy	100	50	50	25	100	50	50	25	50	25	350	175
Dissertation	APPROVED/NOT APPROVED								100	50	100	50

#### 3.4 Papers in each year

As in 3.2

#### 3.5 Details of theory exams

Question paper pattern for MPT theory examination

Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	20

<b>Brief structured essay</b>	<b>10</b>	<b>6</b>

### BROAD GUIDELINES

Paper	Subjects		Distribution of marks	Total marks
Paper I Applied Basic Sciences	1	Bio Statistics and Research Methodology	30	100
	2	Biomechanics and Pathomechanics	30	
	3	Ergonomics	10	
	4	Nutrition and Exercise Physiology	30	
Paper II Physiotherapeutics	1	Manual therapy	25	100
	2	Exercise therapy	25	
	3	Electro therapy	25	
	4	Electrophysiology	25	
Paper III(Speciality) Physiotherapy assessment	1.	Anatomy and Physiology	15	100
	2.	Clinical Orthopaedics and Sports	15	
	3.	Physical and functional diagnosis	30	
	4.	Physiotherapy interventions	40	

Structured Essay should be explanatory and brief structured Essay should be descriptive.

### 3.6 Model question paper for each subject with question paper pattern

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

#### PAPER I – APPLIED BASIC SCIENCES

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

#### I. Long Essay (2 x 20 = 40 marks)

1. Explain in detail about the functional adaptation of bone under pathological conditions.

2. Discuss about exercise in different altitudes and various climatic conditions.

**II. Short notes: (10 x 6 = 60 marks)**

1. Back care for physiotherapist in clinics
2. Job analysis
3. Energy expenditure during walking and running
4. Ergonomic modifications for a software professional
5. DOMS
6. Plyometrics
7. Pre-competition meal
8. Hallux valgus
9. Methods of sampling
10. Hypothesis testing

**MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION**

**PAPER II – PHYSIOTHERAPEUTICS**

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

**I. Long Essay (2 x 20 = 40 marks)**

1. Describe the types of Mckenzie's syndromes, use of repeated movements in Mckenzie's method of spinal examination and explain the treatment principles for derangement syndrome
2. Explain in detail the neurophysiological principles and treatment principles of proprioceptive neuromuscular facilitation techniques. Describe about various proprioceptive neuromuscular facilitation techniques to improve stability

**II. Short notes (10 x 6 = 60 marks)**

1. Neural mobilization
2. EMG changes in peripheral neuropathies
3. Principles of Muscle Energy Techniques
4. Concave-convex rule and its importance in manipulation
5. Russian currents
6. Iontophoresis
7. Pain assessment
8. Functional Electrical Stimulation
9. Skin fold measurement
10. Close pack and loose pack position

**MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION**

**PAPER III – MUSCULO SKELETAL & SPORTS PHYSIOTHERAPY**

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions**

**I. Long Essay (2 x 20 = 40 marks)**

1. Physiotherapy evaluation of low back pain. Discuss about its differential diagnosis in detail.
2. 26 year old male foot ball player underwent ACL reconstruction with patellar graft. Prescribe a planned physiotherapy protocol.

**II. Short notes (10 x 6 = 60 marks)**

1. Cryotherapy in sports
2. Principles of aerobic fitness training.
3. Tendon gliding exercises in Carpal tunnel syndrome
4. DAPRE technique
5. Preparation of a sports physiotherapist when traveling with team.
6. Core stability exercises
7. Different mechanisms of sports injury.
8. Management of Thoracic Kyphosis
9. Special test for neck pain
10. Mckenzie approach for Low Back Pain

**3.7 Internal assessment component**

- a. There shall be a minimum of 3 periodic assessments, for theory and practical including viva separately, of which the final one shall be in the KUHS pattern and is mandatory.
- b. Average of the marks of the KUHS pattern examination and the best out of the remaining periodical assessments shall be taken as internal assessment mark of the candidate
- c. The class average of internal assessments mark of theory and practical should not exceed 75% of Maximum marks
- d. The class average of internal assessment for an examination shall be calculated based on the total number of candidates in a particular batch appearing for that internal assessment examination.
- e. The candidate must secure the minimum marks of 50% for internal assessment in theory, practical and viva voce in a particular subject order to be eligible to appear in the university examination of the subject.

**3.8 Details of practical/clinical practicum exams**

PRACTICAL 1 - PHYSIOTHERAPEUTICS

(Practical exam is emphasized only on Exercise, Electrotherapy and Manual Therapy)

- One long case - 60 marks

- One short case - 40 marks
- Viva - 50 marks

#### PRACTICAL 2 – Musculoskeletal and Sports Physiotherapy

(Practical exam is emphasized only on Physiotherapy assessment and Interventions)

- One long case - 60 marks
- One short case - 40 marks
- Viva - 50 marks

#### 3.9 Number of examiners (Internal & External) and their qualifications

There will be two examiners for each subject where practical/ or viva to be conducted. One examiner (INTERNAL EXAMINER) is preferably from the same institution or as decided by the KUHS and the other examiner will be from another university (EXTERNAL EXAMINER). The examiners should have at least 5 years of teaching experience after post graduation.

#### 3.10 Details of viva:

Wherever viva is prescribed the same will be conducted by the internal and external examiners appointed for practical examinations.

#### 4 INTERNSHIP

Not applicable

#### 5 ANNEXURES

5.3 **Check Lists for Monitoring:** Log Book, Seminar, Assessment etc. to be formulated by the curriculum committee of the concerned Institution

## SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596



**MASTER OF PHYSIOTHERAPY (MPT)**

**IN CARDIO RESPIRATORY**

**Course Code: 297**

**(2016-17 Academic year onwards)**

2016

## **2. COURSE CONTENT**

### **2.1 Title of course:**

**MASTER OF PHYSIOTHERAPY DEGREE (CARDIO RESPIRATORY PHYSIOTHERAPY)**

### **2.2 Objectives of course**

The Master of Physiotherapy Program is directed towards rendering training in the Cardio Respiratory Physiotherapy so as to enhance individual competence in order to fulfill requirement and to meet the global standards of Physiotherapy education and practice. Specific aims are:

1. To gain in knowledge of the human body related Basic Medical and Physiotherapeutic sciences relevant to Cardio Respiratory Physiotherapy.
2. To gain in knowledge of movement dysfunction of human body and evidence based Physiotherapeutic management for movement dysfunction
3. To develop skills in Physiotherapy assessment pertaining to Cardio Respiratory disorders by relevant current physiotherapeutic concepts.
4. To plan and implement appropriate Physiotherapeutic intervention for all clinical conditions related to Cardio Respiratory disorders in acute and chronic phases, critical care, indoor and outdoor institutional care and independent practice.
5. To develop skills as a self-directed learner, recognize continuous education needs, select and use appropriate learning resources.
6. To develop ability to teach post graduate and undergraduate Physiotherapy students
7. To demonstrate managerial, administrative skills and legislation applicable to compensation for functional disability and appropriate certification
8. Acquainting a student with concept of quality of care at the institutional as well as the community levels.

### **2.3 Medium of instruction:**

Medium of instruction and examinations shall be in English.

### **2.4 Course outline**

The Masters Degree in Physiotherapy is a two year program consisting of classroom teaching, self directed academic learning activities, a research project and clinical postings.

In the first year theoretical basis of fundamental Physiotherapy subjects are refreshed. In the second year, the students learn on the clinical conditions, physiotherapy assessment and advanced techniques in Cardio Respiratory disorders. During these two years, the students will be posted in Cardiology, Pulmonology and Cardiothoracic surgery and Intensive care departments. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference and workshop to enhance their knowledge during their entire course of the study. University examinations are held at the end of second year. To fulfill their course completion, the students are required to complete and submit their dissertation on the research project.

## **2.5 Duration**

The duration of the course shall be two years.

## **2.6 Syllabus**

### **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. Research Methods**

##### **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

## 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
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

## 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
18. Work capacity analysis
19. Role of Physiotherapy in industrial set up
20. Workers functional capacity assessment
21. Industrial therapy

22. Educational programme for prevention of injury
23. Adult education
24. Injury prevention and ergonomics
25. Work capacity analysis
26. Role of Physiotherapy in industrial set up
27. Workers functional capacity assessment
28. Industrial therapy
29. Educational programme for prevention of injury
30. Adult education
31. Injury prevention and ergonomics

#### **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

## **PAPER II 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. 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

## **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**

## **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. Ionotoprosis

## **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

## **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
2. EMG biofeedback
3. Application of traditional and contemporary techniques in Physiotherapy
4. Common parameters used in Physiotherapy research

## Paper III CARDIO RESPIRATORY PHYSIOTHERAPY

### This paper consists of 3 Modules:

- **Cardio Respiratory Anatomy, Physiology and Clinical conditions**
- **Physical and functional assessment**
- **Physiotherapy interventions**

### Module I Cardio Respiratory Anatomy, Physiology and Clinical conditions

#### Part I Fundamentals in Cardio-Respiratory Physiotherapy

### Unit

1. Anatomy, physiology, biomechanics, pathomechanics & applied anatomy related to Cardiovascular & Pulmonary System
2. Development of the Cardio Vascular, Pulmonary systems and deviations from the normal development.
3. Age related changes in Cardiovascular & Pulmonary System
4. Physiology of microcirculation and edema
5. Body positioning and various systemic changes
6. Respiratory muscle physiology, fatigue and training

7. Normal and abnormal responses of Cardiovascular & Pulmonary System during exercise
8. Breathing mechanism in normal and diseased.

## Part II Clinical Conditions

### Unit

#### 1. Respiratory Conditions

- Obstructive lung diseases
- Restrictive lung diseases
- Suppurative lung diseases
- Infective lung diseases
- Occupational lung diseases
- Chest trauma
- Chest wall deformities
- Lung cancers
- Children with respiratory dysfunction
- Diaphragmatic diseases
- Sleep apnoea
- Hyperventilation syndrome

#### 2. Cardio Vascular Conditions

- Congenital heart diseases
- Acquired heart diseases
- Myocardial infarction
- Hypertension
- Diseases of the myocardium
- Pericardial diseases
- Tumors of the heart
- Vascular diseases

- Peripheral vascular diseases

## **Module II Physical and functional Assessment**

### **Unit**

#### **I. Introduction to Physiotherapy Assessment**

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy versus medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Musculoskeletal
- Neuromuscular
- Cardiovascular/pulmonary
- Integumentary
- Today's health care model

#### **II. Influence of Psychological Factors on Réhabilitation**

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

#### **III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment**

- Process of assessment
- Values and valuing
- Code of ethics
- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care

- Value – Laden situation in rehabilitation

#### **IV. Examination of Functional Status and Activity Level**

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

#### **V. Examination of Environment**

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety Adaptive equipment
- Assistive technology Examination of the workplace Community access Documentation
- Funding for environmental modifications Legislation

#### **VI. Guideline for Physiotherapy Documentation**

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

#### **VII. Disablement and Enablement Concepts for Physiotherapy Research and Practice**

- Traditional model
- Consequences of disease model
- NAGI model
- International Classification of Impairments Disability and Handicap Model (ICIDH – 1)
- National Center for Medical Rehabilitation Research Model 1 &2 (NCMRR)
- Components of Health
- International Classification of Functioning, Disability and Health (ICF / ICIDH - 2)

### **VIII. ICF Coding**

- History and development of the ICF
- The ICF and the WHO family of international classifications
- Components of the ICF
- ICF coding
- Benefits of Using ICF

### **IX. Evidence Based Practice**

- Principles of evidence-based Physiotherapy practice
- Elements of evidence
- Appraising the evidence
- Evidence in practice

### **Part X Assessment of cardio respiratory conditions**

1. Skills of physiotherapeutic & functional Assessment of Cardiopulmonary system.
2. Basic principles and concepts of thoracic imaging, Electrocardiogram, Pulmonary function tests, Respiratory And Cardio -Vascular stress test & Ergometry; Cardiac Catheterization & Coronary angiography.

### **Module III Physiotherapy Interventions**

#### **Part I Basic Foundations**

##### **Unit**

1. History of Cardio pulmonary Physiotherapy
2. Concepts in Cardio-respiratory Physiotherapy
3. Concepts in Cardio-pulmonary Rehabilitation.

#### **Part II Special Techniques**

##### **Unit**

- Body positioning techniques
- Relaxation techniques
- Breathing exercises
- Breathing re-education techniques

- Advanced airway clearance techniques
- Facilitating ventilatory patterns and breathing strategies
- Evidence based practice in Cardiac Rehabilitation
- Evidence based practice in Pulmonary Rehabilitation
- Ventilator – dependent patient
- Adjuncts to Chest Physiotherapy
- Humidification
- Nebulization
- Aerosol delivery
- Mechanical ventilation (Invasive, Non Invasive)
- Airways
- Tracheostomy care
- Suction
- Manual hyper inflation
- Lung expansion therapies

### Part III Management for Clinical Conditions

#### Unit

1. Cardio vascular system
  - Cardiac conditions
  - Peripheral vascular diseases
2. Respiratory system
  - Obstructive conditions
  - Restrictive conditions
  - Suppurative conditions
  - Infective conditions
  - Occupational lung diseases
  - Chest trauma
  - Chest wall deformities
  - Lung cancers

- Children and Neonates
3. Physiotherapy Management after Surgery
  4. Life-style modifications
  5. Cardio-pulmonary fitness training and disability evaluation

The concept of health care counseling shall be incorporated in all relevant areas.

## 2.7 Total number of hours

Total number of hours will be 3240 hours during the two years of study.

## 2.8 Branches if any with definition

## 2.9 Teaching learning methods

Teaching learning methods will include class room lectures, practical and laboratory demonstrations, and bed side clinical demonstrations by qualified faculty and self directed learning by the students through assignments, seminar and case presentations, journal clubs and research works under the faculty guidance.

## 2.10 Content of each subject in each year

As in 2.6 above

## 2.11 No: of hours per subject

Paper	Teaching and Learning Methods	Weekly class hours	Total hours
Paper I: Applied Basic Sciences Subjects: 1. Bio Statistics and Research Methodology 2. Biomechanics and Pathomechanics 3. Ergonomics 4. Nutrition and Exercise Physiology	Lectures	2	180
	Seminars	2	180
	Practicals and Demonstrations	4	360
	Clinical Discussions	2	180
	Clinical Case Presentations	2	180
Paper II: Physiotherapeutics Subjects: 1. Manual therapy 2. Exercise therapy 3. Electro therapy 4. Electrophysiology	Journal Club	2	180
	Class room teaching	1	90
	Library	3	270
	Clinical Training	15	1350
Paper III Cardio Respiratory			

Physiotherapy Subjects: 1. Anatomy and Physiology 2. Clinical condition 3. Physiotherapy assessment 4. Foundational concepts and condition management 5. Special techniques			
Synopsis & Dissertation work			210
Community Camps, Field Visits, Participation in Workshops & Conferences		3	60
<b>TOTAL HOURS</b>		36	3240

### 2.12 Practical training

Practical training should be imparted under laboratory conditions for the basic science subjects with emphasis on carrying out the experiments and tests through demonstration by relevant faculty and repeated practice by the students. For physiotherapy assessment and treatment techniques these should be first demonstrated on human models and the students should practice on human models repeatedly until proficiency is gained. Later the techniques should be demonstrated on patients during bed side clinics and the students are encouraged to carry out the techniques on patients under strict and close supervision of faculty.

### 2.13 Records

In all subjects with practical components meticulous records should be kept regarding the topic of the practical training, procedure, materials and methods used, results and outcomes. The records should be submitted for inspection during practical or viva examination.

### 2.14 Dissertation: As per Dissertation Regulations of KUHS

### 2.15 Specialty training if any

### 2.16 Project work to be done if any

Not applicable

### 2.17 Any other requirements [CME, Paper Publishing etc.]

All students should attend at least two CME program each year preferably conducted in their own institution and two other conferences/workshops.

### 2.18 Prescribed/recommended textbooks for each subject

**Bio statistics, Research methodology**

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

### **Biomechanics and Pathomechanics**

1. Basic biomechanics of the musculoskeletal system by Margareta Nordin and Victor H. Frankle, 2<sup>nd</sup> edition ( Lea and Febiger)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5<sup>th</sup> 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, 2<sup>nd</sup> 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 (Williams & Wilkins, 1997)

### **Ergonomics**

1. Industrial Therapy by Glenda L. Key, 1<sup>st</sup> Edition (Mosby)

### **Nutrition and Exercise physiology**

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)

### **Manual Therapy**

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

### **Exercise Therapy**

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)

### **Electrotherapy**

1. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2<sup>nd</sup> edition (Pearson prentice hall 2006)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2<sup>nd</sup> edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

### **Electrophysiology**

1. Electromyography in clinical practice by Michael J. Aminoff, 3rd edition (Churchill Livingstone)
2. Clinical neurophysiology by UK Misra and Kalita, 2<sup>nd</sup> 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, 2<sup>nd</sup> edition (Pearson prentice hall 2006)

### **Cardio Respiratory disorders**

1. Human Physiology by Guyton
2. Physiology of Human joints by Kapandji
3. Hand book of physiology in Aging - Masoro, C.R.C Press
4. Mechanical Ventilation by Irwin R.S.Bemers
5. Mechanical Ventilation by David W. Chang
6. Baum's text book of pulmonary diseases
7. Crofton and Douglas's Respiratory diseases

8. Egan's Fundamentals of Respiratory care by Robert Wilkins
9. Harrison's Textbook of medicine
10. Braunwald's Cardiology
11. API's Text book of Medicine

### **Physical and functional assessment**

1. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
2. Physical rehabilitation (4& 5<sup>th</sup> edition) by Susan B O Sullivan and Thomas J Schmitz. (Jaypee publication)
3. International Classification of Functioning, disability and health: Short version. (IT'S Publication)
4. Professionalism in physical therapy: History, Practice and Development by Laura Lee Swisher and Catherine G. Page, (Elsevier publication 2005)
5. Effective Documentation for Physical Therapy Professionals, by Eric Shamus and Debra (McGraw Hill company 2004)
6. Physical therapy Documentation: From examination to outcome by Mia Erickson, Ralph Utzman (Slack incorporated 2008)
7. Writing SOAP Notes with Patient / Client management Formats by Ginge Kettenbach, Ph. D., PT, 3<sup>rd</sup> Edition, 2004, F.A. DAVIS COMPANY. Philadelphia
8. Practical Evidence-Based Physiotherapy Rob Herbert, Gro Jamtvedt, Judy Mead, Kare Birger Hagen Elsevier Butter worth Heinemann; Oxford UK (2005)
9. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell, PT, PhD, Virginia Commonwealth University, Virginia
10. Hand book of neurologic rating scales by Robert M. Herndon, 2nd edition, (Demos publications 2005)
11. ECG by Schamroth
12. Interpretation of Pulmonary Function Tests: A Practical Guide by Hyatt, Robert E.; Scanlon, Paul D
13. Principles of Exercise Testing and Interpretation: Including Pathophysiology and Clinical Applications by Kalman Wasserman

### **Physiotherapy Interventions**

1. Cardio pulmonary physical therapy by Scott Irwin
2. Cardio pulmonary physical therapy by Donna Frownfelter

3. Principles of cardio pulmonary physical therapy by Asbury & Petty
4. Cardio pulmonary physical therapy by Helen Hillegas, (Saunders)
5. PT for RT & cardiac problems by Weber
6. Cardio pulmonary physical therapy by Joanne Watchie
7. Physiotherapy for respiratory and cardiac problems by Pryor JA; Prasad SA, Elsevier
8. Respiratory care – A guide to clinical practice by Burton G.G. & Hodgkin
9. Brompton's Chest Physiotherapy
10. Physiotherapy in respiratory care by Hough a Jaypee Publishers
11. Chest physiotherapy in intensive care unit by Mackenzie CF Williams and Wilkins
12. Cardiovascular and Pulmonary physical therapy by Felter D.F. Mosby
13. Exercise and the heart by Froelicher V.F. Elsevier
14. Cardiovascular health and disease in women by Douglas PS. Saunders
15. Acute care handbook for physical therapist by Jamie C.Paz Michel P. West. Butterworth Heine Mann
16. Physical therapy for children by Campbell Suzann K, W.B Saunders, Philadelphia
17. Chest physiotherapy in Intensive care unit by Mackenzie, Williams & Wilkins, Baltimore
18. Cardiopulmonary symptoms in physiotherapy by Cohen M, Churchill, Livingstone, London
19. Physical rehabilitation: assessment and treatment by O'Sullivan, F.A Davis, Philadelphia
20. Clinical application of ventilatory support by Kinky Churchill, Livingstone, New York
21. Pulmonary rehabilitation: guidelines to success by Bodkins, Butterworth, Boston
22. Cardiac rehabilitation by Amundsen lord, Churchill, Livingstone, London
23. Physical therapy of the cancer patient by McGaryex Charles, Churchill, Livingstone, New York
24. Multidisciplinary approach to breathing disorder by Leon
25. Clinical Exercise testing by Jones
26. Pulmonary rehabilitation. The Obstructive and Paralytic Conditions by John
27. Coronary artery disease essentials of prevention and Rehabilitation Program by Peter
28. Pulmonary Rehabilitation by John Hodgkin (Elsevier)

## 2.19 Reference books

Same as 2.18

## 2.20 Journals

1. Journal of Physical Therapy
2. Physiotherapy
3. Australian Journal of Physiotherapy
4. Indian Journal of Physiotherapy
5. Journal of Orthopaedics and Sports physiotherapy

## 2.21 Logbook

Every student shall maintain a record of skills (Log book) he/she has acquired during each year of training period certified by the various heads of the department where he/she has undergone training. The Head of the department shall scrutinize the log book once in every three months. At the end of each year, the candidate should summarize the contents and get the log book certified by the Head of the Institution.

## 3. EXAMINATIONS

### 3.1 Eligibility to appear for exams

There shall be 80% attendance in theory and practical/clinical separately to appear for the University examination. The candidate must secure the minimum marks of 50% in internal assessment in theory and practical in a particular subject in order to be eligible to appear in the university examination of the subject.

### 3.2 Schedule of Regular/Supplementary exams

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time.

Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of publication of results of regular examination.

### 3.3 Scheme of examination showing maximum marks and minimum marks

SUBJECT	THEORY		THEORY INTERNAL		PRACTICAL		PRACTICAL INTERNAL		Viva		TOTAL	
	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass
Paper I	100	50	50	25	***	***	***	***	***	***	150	75

Applied Basic Sciences													
Paper II Physiotherapeutics	100	50	50	25	100	50	50	25	50	25	350	175	
Paper III Cardio Respiratory Physiotherapy	100	50	50	25	100	50	50	25	50	25	350	175	
Dissertation	APPROVED/NOT APPROVED									100	50	100	50

### 3.4 Papers in each year

As in 3.2

### 3.5 Details of theory exams

#### Question paper pattern for MPT theory examination

Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	20
Brief structured essay	10	6

#### BROAD GUIDELINES

Paper	Subjects	Distribution of marks	Total marks
Paper I Applied Basic Sciences	1 Bio Statistics and Research Methodology	30	100
	2 Biomechanics and Pathomechanics	30	
	3 Ergonomics	10	
	4 Nutrition and Exercise Physiology	30	
Paper II Physiotherapeutics	1 Manual therapy	25	100
	2 Exercise therapy	25	
	3 Electro therapy	25	
	4 Electrophysiology	25	
Paper III Cardio Respiratory Physiotherapy	1. Anatomy and Physiology	15	100
	2. Cardio Respiratory Disorders	15	
	3. Physical and functional diagnosis	30	
	4. Physiotherapy interventions	40	

Structured Essay should be explanatory and brief structured Essay should be descriptive.

### 3.6 Model question paper for each subject with question paper pattern

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION PAPER I – APPLIED BASIC SCIENCES

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

#### I. Long Essay (2 x 20 = 40 marks)

1. Explain in detail about the functional adaptation of bone under pathological conditions.
2. Discuss about exercise in different altitudes and various climatic conditions.

#### II. Short notes: (10 x 6 = 60 marks)

1. Back care for physiotherapist in clinics
2. Job analysis
3. Energy expenditure during walking and running
4. Ergonomic modifications for a software professional
5. DOMS
6. Plyometrics
7. Pre-competition meal
8. Hallux valgus
9. Methods of sampling
10. Hypothesis testing

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

#### PAPER II – PHYSIOTHERAPEUTICS

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

#### I. Long Essay (2 x 20 = 40 marks)

1. Describe the types of Mckenzie's syndromes, use of repeated movements in Mckenzie's method of spinal examination and explain the treatment principles for derangement syndrome
2. Explain in detail the neurophysiological principles and treatment principles of proprioceptive neuromuscular facilitation techniques. Describe about various proprioceptive neuromuscular facilitation techniques to improve stability

## II. Short notes (10 x 6 = 60 marks)

1. Neural mobilization
2. EMG changes in peripheral neuropathies
3. Principles of Muscle Energy Techniques
4. Concave-convex rule and its importance in manipulation
5. Russian currents
6. Iontophoresis
7. Pain assessment
8. Functional Electrical Stimulation
9. Skin fold measurement
10. Close pack and loose pack position

## MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

### PAPER III - CARDIO RESPIRATORY PHYSIOTHERAPY

**Q.P. Code:**

**Time: Three Hours  
marks**

**Maximum: 100**

**Answer ALL questions**

## I. Long Essay (2 x 20 = 40 marks)

1. Define Immobilization? Describe the various body positions and its effect on cardio respiratory system.
2. Facilitating ventilatory patterns and breathing strategies

## II. Short notes (10 x 6 = 60 marks)

1. Hyperventilation syndrome
2. Pectus excavatum
3. Myocarditis
4. Exercise stress testing
5. Postural hypotension
6. Metabolic equivalent
7. Ejection fraction.
8. Advanced airway clearance technique
9. Aerobic training in coronary artery disease
10. Abnormal lung sounds

### 3.7 Internal assessment component

- a. There shall be a minimum of 3 periodic assessments, for theory and practical including viva separately, of which the final one shall be in the KUHS pattern and is mandatory.
- b. Average of the marks of the KUHS pattern examination and the best out of the remaining periodical assessments shall be taken as internal assessment mark of the candidate
- c. The class average of internal assessments mark of theory and practical should not exceed 75% of Maximum marks
- d. The class average of internal assessment for an examination shall be calculated based on the total number of candidates in a particular batch appearing for that internal assessment examination.
- e. The candidate must secure the minimum marks of 40% for internal assessment in theory, practical and viva voce in a particular subject order to be eligible to appear in the university examination of the subject.

### 3.8 Details of practical/clinical practicum exams

#### PRACTICAL 1 - Physiotherapeutics

(Practical exam is emphasized only on Exercise, Electrotherapy and Manual Therapy)

- One long case - 60 marks
- One short case - 40 marks
- Orals - 50 marks

#### PRACTICAL 2 – Cardio Respiratory Physiotherapy

(Practical exam is emphasized only on Physiotherapy assessment and Interventions)

- One long case - 60 marks
- One short case - 40 marks
- Orals - 50 marks

### 3.9 Number of examiners (Internal & External) and their qualifications

There will be two examiners for each subject where practical/ or viva to be conducted. One examiner (INTERNAL EXAMINER) is preferably from the same institution or as decided by the KUHS and the other examiner will be from another university (EXTERNAL EXAMINER). The examiners should have at least 5 years of teaching experience after post graduation.

### 3.10 Details of viva:

Wherever viva is prescribed the same will be conducted by the internal and external examiners appointed for practical examinations.

#### 4 INTERNSHIP

Not applicable

#### 5 ANNEXURES

5.3 **Check Lists for Monitoring:** Log Book, Seminar, Assessment etc. to be formulated by the curriculum committee of the concerned Institution



**SYLLABUS**

**for Courses affiliated to the**

**Kerala University of Health Sciences**

**Thrissur 680596**



**MASTER OF PHYSIOTHERAPY (MPT)**

**IN**

**PAEDIATRICS**

**Course Code: 306**

**(2016-17 Academic year onwards)**

2016

## 2. COURSE CONTENT

### 2.1 Title of course:

#### **MASTER OF PHYSIOTHERAPY DEGREE (PAEDIATRIC PHYSIOTHERAPY)**

### 2.2 Objectives of course

The Master of Physiotherapy Program is directed towards rendering training in the Cardio Respiratory Physiotherapy so as to enhance individual competence in order to fulfill requirement and to meet the global standards of Physiotherapy education and practice. Specific aims are:

1. To gain in knowledge of the human body related Basic Medical and Physiotherapeutic sciences relevant to Paediatric Physiotherapy.
2. To gain in knowledge of movement dysfunction of human body and evidence based Physiotherapeutic management for movement dysfunction
3. To develop skills in Physiotherapy assessment pertaining to Paediatric disorders by relevant current physiotherapeutic concepts.
4. To plan and implement appropriate Physiotherapeutic intervention for all clinical conditions related to Paediatric disorders in acute and chronic phases, critical care, indoor and outdoor institutional care and independent practice.
5. To develop skills as a self-directed learner, recognize continuous education needs, select and use appropriate learning resources.
6. To develop ability to teach post graduate and undergraduate Physiotherapy students
7. To demonstrate managerial, administrative skills and legislation applicable to compensation for functional disability and appropriate certification
8. Acquainting a student with concept of quality of care at the institutional as well as the community levels.

### 2.3 Medium of instruction:

Medium of instruction and examinations shall be in English.

### 2.4 Course outline

The Masters Degree in Physiotherapy is a two year program consisting of classroom teaching, self directed academic learning activities, a research project and clinical postings. In the first year theoretical basis of fundamental Physiotherapy subjects are refreshed. In the second year, the students learn on the clinical conditions, physiotherapy assessment and advanced techniques in Cardio Respiratory disorders.

During these two years, the students will be posted in Paediatric, Paediatric Surgery, Paediatric and Neonatal ICU departments. The learning program includes seminars, journal reviews, case presentations, case discussions and classroom teaching. Some of the clinical postings are provided at other reputed centers in the country in order to offer a wider spectrum of experience. The students are encouraged to attend conference and workshop to enhance their knowledge during their entire course of the study. University examinations are held at the end of second year. To fulfill their course completion, the students are required to complete and submit their dissertation on the research project.

## **2.5 Duration**

The duration of the course shall be two years.

## **2.6 Syllabus**

### **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. Research Methods**

##### **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

## 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
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

**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
18. Work capacity analysis
19. Role of Physiotherapy in industrial set up
20. Workers functional capacity assessment
21. Industrial therapy
22. Educational programme for prevention of injury
23. Adult education
24. Injury prevention and ergonomics
25. Work capacity analysis
26. Role of Physiotherapy in industrial set up

27. Workers functional capacity assessment
28. Industrial therapy
29. Educational programme for prevention of injury
30. Adult education
31. Injury prevention and ergonomics

## **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

## **PAPER II 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. 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

### **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**

#### **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. Ionotoprosis

#### **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

#### **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
2. EMG biofeedback
3. Application of traditional and contemporary techniques in Physiotherapy
4. Common parameters used in Physiotherapy research

## Paper III PAEDIATRIC PHYSIOTHERAPY

This paper consists of 3 Modules:

- Paediatric Anatomy, Physiology and Clinical conditions
- Physical and functional assessment
- Physiotherapy interventions

### Module I Paediatric Anatomy, Physiology and Clinical conditions

#### Part I Fundamentals in Pediatrics

### Unit

1. Foetal development
2. Nervous system

- Overview of growth and development
  - Basic and applied neuroanatomy
  - Neurophysiology
3. Musculoskeletal System
- Overview of growth and development
  - Musculoskeletal tissue systems - Connective tissue, muscles, bones and alignment of skeletal system.
4. Cardio Pulmonary system
- Overview of growth and development
  - Respiratory muscle physiology in normal and diseased

## Part II Clinical Conditions

### Unit

1. Neurological conditions
- Cerebral palsy
  - Neural tube defects
  - High-risk infants
  - Brachial plexus injury
  - Brain injuries
  - Spinal cord injury
  - Developmental coordination disorders
  - Gullain barre syndrome
  - Spinal muscular atrophy
  - Infectious diseases of brain
2. Musculoskeletal conditions
- Orthopedic conditions
  - Juvenile rheumatoid arthritis
  - Muscular dystrophy
  - Poliomyelitis

- Congenital muscular torticollis
  - Arthrogyriposis multiplex congenita
  - Osteogenesis imperfecta
  - Sports injuries in children
  - Limb deficiencies and amputations
3. Cardiopulmonary conditions
- Conditions requiring mechanical ventilation
  - Pulmonary conditions - Asthma, Cystic Fibrosis, Infant Respiratory Distress Syndrome, Bronchopulmonary Dysplasia, Musculoskeletal System
  - Impairments, Neuromuscular System Impairments
  - Cardiac conditions - Cardiovascular structural deficits
  - Cardiac and thoracic surgeries
4. Genetic syndromes
- Genetics and development
  - Chromosomal Disorders
  - Single Gene Disorders
5. Pediatric oncology
- Etiology, types, signs & symptoms, physiotherapy management
6. Burns
- Classification and pathophysiology, Physiotherapy management

## **Module II Physical and functional Assessment**

### **Unit**

#### **I. Introduction to Physiotherapy Assessment**

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy verses medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Musculoskeletal
- Neuromuscular
- Cardiovascular/pulmonary
- Integumentary
- Today's health care model

## II. Influence of Psychological Factors on Réhabilitation

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

## III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment

- Process of assessment
- Values and valuing
- Code of ethics
- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

## IV. Examination of Functional Status and Activity Level

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

## V. Examination of Environment

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety Adaptive equipment
- Assistive technology Examination of the workplace Community access Documentation
- Funding for environmental modifications Legislation

## **VI. Guideline for Physiotherapy Documentation**

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

## **VII. Disablement and Enablement Concepts for Physiotherapy Research and Practice**

- Traditional model
- Consequences of disease model
- NAGI model
- International Classification of Impairments Disability and Handicap Model (ICIDH – 1)
- National Center for Medical Rehabilitation Research Model 1 &2 (NCMRR)
- Components of Health
- International Classification of Functioning, Disability and Health (ICF / ICIDH - 2)

## **VIII. ICF Coding**

- History and development of the ICF
- The ICF and the WHO family of international classifications
- Components of the ICF
- ICF coding
- Benefits of Using ICF

## **IX. Evidence Based Practice**

- Principles of evidence-based Physiotherapy practice
- Elements of evidence
- Appraising the evidence
- Evidence in practice

## **X. Assessment of Paediatric conditions**

1. Detail assessment procedures related to the elective conditions
  - Overview of pediatric neurological, musculoskeletal and cardiopulmonary Assessments with emphasis on early assessment and diagnosis
2. Principles of Laboratory investigations and other tests - Computerized Tomography Scan, Magnetic Resonance Imaging, Electromyography, Nerve Conduction Study, Evoked Potentials, Muscle Biopsy, Thoracic Imaging, Pulmonary Function Tests, and Exercise Testing.

## **Module III Physiotherapy Interventions**

### **Part I Fundamental Concepts**

#### **Unit**

1. Motor control
  - Theories, variables, motor skill acquisition in children
2. Motor Learning
  - Theories, motor learning constructs, motor learning and teaching strategies
3. The child's development of functional movement
  - Motor development theories
  - Developmental processes and principles
  - Stages of motor development
4. Reflexes and Reactions
  - Survival and vestigial reflexes
  - Attitudinal postural reflexes
  - Righting reactions
  - Balance reactions
5. Ethical and Legal Framework of pediatric Physical therapy practice
6. Models of team interaction and service delivery in pediatric Physical Therapy practice

### **Part II Advanced Approaches used in Pediatric Physical Therapy**

#### **Unit**

1. **Special approaches**
  - Neurodevelopment therapy
  - Sensorimotor approach
  - Sensory integration therapy
  - Proprioceptive neuromuscular facilitation
  - Electromyography biofeedback
  - Constraint-induced movement therapy

- Myofascial release
- Mobilization and manipulations
- Muscle energy technique
- Advanced airway clearance techniques
- Suit and Robotic therapy

## 2. Early intervention services

- Elements of early intervention
- Effectiveness and implications for pediatric Physical Therapy practice
- Family centered Care
- Role of Physical therapist

## Part II Physical Therapy management

1. Management of Pediatric Neurological, Musculoskeletal and Cardiopulmonary conditions using advanced Physical Therapy interventions
2. Role of Physical therapist in Neonatal and Pediatric Intensive care units
3. Cardiopulmonary resuscitation in children
4. Sports injuries in children
  - Components of physical performance and sports performance Physiotherapy management for sports injuries
5. Genetic syndromes
  - Physical therapy management for various genetic syndromes resulting in neurological, Musculoskeletal and cardiopulmonary impairments.
6. Pediatric oncology
  - Physical therapy interventions for different types of cancers, bone marrow Transplantation and terminal disease
7. Burns
  - Physical therapy management in emergent, acute, skin graft, rehabilitation and Reconstructive phases
  - Splinting, pressure garments and inserts
8. Assistive technology
  - Role of assistive devices and application of recent technologies
  - Determining a child's equipment needs and equipment selection

- Commonly used equipments

The concept of health care counseling shall be incorporated in all relevant areas.

## 2.7 Total number of hours

Total number of hours will be 3240 hours during the four years of study.

## 2.8 Branches if any with definition

## 2.9 Teaching learning methods

Teaching learning methods will include class room lectures, practical and laboratory demonstrations, and bed side clinical demonstrations by qualified faculty and self directed learning by the students through assignments, seminar and case presentations, journal clubs and research works under the faculty guidance.

## 2.10 Content of each subject in each year

As in 2.6 above

## 2.11 No: of hours per subject

Paper	Teaching and Learning Methods	Weekly class hours	Total hours
Paper I: Applied Basic Sciences Subjects: 1. Bio Statistics and Research Methodology 2. Biomechanics and Pathomechanics 3. Ergonomics 4. Nutrition and Exercise Physiology	Lectures	2	180
	Seminars	2	180
	Practicals and Demonstrations	4	360
	Clinical Discussions	2	180
	Clinical Case Presentations	2	180
Paper II: Physiotherapeutics Subjects: 1. Manual therapy 2. Exercise therapy 3. Electro therapy 4. Electrophysiology	Journal Club	2	180
	Class room teaching	1	90
	Library	3	270
	Clinical Training	15	1350
Paper III Paediatric Physiotherapy Subjects: 1. Anatomy and Physiology 2. Clinical condition			

3. Physiotherapy assessment			
4. Foundational concepts and condition management			
5. Special techniques			
Synopsis & Dissertation work			210
Community Camps, Field Visits, Participation in Workshops & Conferences		3	60
TOTAL HOURS		36	3240

### 2.12 Practical training

Practical training should be imparted under laboratory conditions for the basic science subjects with emphasis on carrying out the experiments and tests through demonstration by relevant faculty and repeated practice by the students. For physiotherapy assessment and treatment techniques these should be first demonstrated on human models and the students should practice on human models repeatedly until proficiency is gained. Later the techniques should be demonstrated on patients during bed side clinics and the students are encouraged to carry out the techniques on patients under strict and close supervision of faculty.

### 2.13 Records

In all subjects with practical components meticulous records should be kept regarding the topic of the practical training, procedure, materials and methods used, results and outcomes. The records should be submitted for inspection during practical or viva examination.

### 2.14 Dissertation: As per Dissertation Regulations of KUHS

### 2.15 Specialty training if any

### 2.16 Project work to be done if any

Not applicable

### 2.17 Any other requirements [CME, Paper Publishing etc.]

All students should attend at least two CME program each year preferably conducted in their own institution and two other conferences/workshops.

## 2.18 Prescribed/recommended textbooks for each subject

### Bio statistics, Research methodology

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

### Biomechanics and Pathomechanics

1. Basic biomechanics of the musculoskeletal system by Margareta Nordin and Victor H. Frankle, 2<sup>nd</sup> edition ( Lea and Febiger)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5<sup>th</sup> 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, 2<sup>nd</sup> 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 (Williams & Wilkins, 1997)

### Ergonomics

2. Industrial Therapy by Glenda L. Key, 1<sup>st</sup> Edition (Mosby)

### Nutrition and Exercise physiology

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)

## **Manual Therapy**

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

## **Exercise Therapy**

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)

## **Electrotherapy**

1. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2<sup>nd</sup> edition (Pearson prentice hall 2006)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2<sup>nd</sup> edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

## **Electrophysiology**

1. Electromyography in clinical practice by Michael J. Aminoff, 3rd edition (Churchill Livingstone)
2. Clinical neurophysiology by UK Misra and Kalita, 2<sup>nd</sup> 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, 2<sup>nd</sup> edition (Pearson prentice hall 2006)

## Paediatrics

1. Pediatric Physical Therapy, Jan Stephen Tecklin, 3<sup>rd</sup> (1999) and 4<sup>th</sup> (2008) editions, Lippincott Williams & Wilkins.
2. Physical Therapy for Children, Suzann K.Campbell, 3<sup>rd</sup> edition, 2006, Saunders Elsevier.
3. Physiotherapy for Children, Teresa Pountney, 2007, Butterworth Heinemann Elsevier.
4. Meeting the Physical Therapy Needs of Children, Susan K.Effgen, 2005, F.A.Davis Company, Philadelphia.

## Physical and functional assessment

1. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
2. Physical rehabilitation (4& 5<sup>th</sup> edition) by Susan B O Sullivan and Thomas J Schmitz. (Jaypee publication)
3. International Classification of Functioning, disability and health: Short version. (IT'S Publication)
4. Professionalism in physical therapy: History, Practice and Development by Laura Lee Swisher and Catherine G.Page, (Elsevier publication 2005)
5. Effective Documentation for Physical Therapy Professionals, by Eric Shamus and Debra (McGraw Hill company 2004)
6. Physical therapy Documentation: From examination to outcome by Mia Erickson, Ralph Utzman (Slack incorporated 2008)
7. Writing SOAP Notes with Patient / Client management Formats by Ginge Kettenbach, Ph. D., PT, 3<sup>rd</sup> Edition, 2004 ,F.A. DAVIS COMPANY. Philadelphia
8. Practical Evidence-Based Physiotherapy Rob Herbert, Gro Jamtvedt, Judy Mead, Kare Birger Hagen Elsevier Butter worth Heinemann; Oxford UK (2005)
9. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell, PT, PhD, Virginia Commonwealth University, Virginia
10. Pediatric Physical Examination, Karen G.Dunder Stadt, 2006, MOSBY Elsevier.
11. Clinics in Physical Therapy Assessment in Early Infancy, Edited by Irmaj. Wilhelm,

1993, Churchill Livingstone.

12. **Motor Assessment of the Developing Infant** , Martha Copier, 1994, Saunders.

### **Physiotherapy Interventions**

1. **Pediatric Physical Therapy**, Jan Stephen Tecklin, 3<sup>rd</sup> (1999) and 4<sup>th</sup> (2008) editions, Lippincott Williams & Wilkins.
2. **Physical Therapy for Children**, Suzann K.Campbell, 3<sup>rd</sup> edition, 2006, Saunders Elsevier.
3. **Physiotherapy for Children**, Teresa Pountney, 2007, Butterworth Heinemann Elsevier.
4. **Meeting the Physical Therapy Needs of Children**, Susan K.Effgen, 2005, F.A.Davis Company, Philadelphia.
5. **Physiotherapy in Pediatrics**, Roberta B. Shepherd, 3rd edition, 1995, Butterworth Heinemann.
6. **Neurologic Intervention for Physical Therapist Assistant**, Martin Kessler, 1<sup>st</sup> & 2<sup>nd</sup> Edition, 2008, W.B.Saunders Company Ltd.
7. **Physiotherapy and the growing child**, Yvonne R Borns & Julie MacDonald, 1996, W.B.Saunders Company Ltd.
8. **Pediatric Rehabilitation**, Gabriella E. Molnar, 3rd edition, 1999. Hanly & Belfus, Philadelphia.
9. **Treatment of Cerebra I Palsy & Motor Delay**, Sophie Levett, 4<sup>th</sup> edition, 2004. Blackwell Publishing.
10. **Pediatric Therapy, A Systems Approach**, Susan Miller Porr, 1999, F.A.Davis Company.
11. **Reflex and Vestibular Aspects of Motor Control, Motor Development and Motor Learning** , R.Barnes, Carolyn A Crutch field, 1990, Stokesville Publishing Company.
12. **Neurological Rehabilitation**, Darcy A. Umphred, 4th & 5th edition, 2007, 2001, MOSBY Elsevier.
13. **Physical Rehabilitation**, Susan B.O Sullivan, 4<sup>th</sup> & 5<sup>th</sup> editions, 2007, Jaypee Brothers.
14. **Cash's Textbook of Neurology for Physiotherapists**, Patricia A. Downie, 4th edition, 1992, Jaypee Brothers.
15. **Cardiovascular & Pulmonary Physical Therapy evidence & practice** , Elizabeth (Dean

& Donna frownfelter, 3th (1996) & 4<sup>th</sup> (2006) editions, MOSBY Elsevier.

### **2.19 Reference books**

Same as 2.18

### **2.20 Journals**

1. Journal of Physical Therapy
2. Physiotherapy
3. Australian Journal of Physiotherapy
4. Indian Journal of Physiotherapy
5. Journal of Orthopaedics and Sports physiotherapy

### **2.21 Logbook**

Every student shall maintain a record of skills (Log book) he/she has acquired during each year of training period certified by the various heads of the department where he/she has undergone training. The Head of the department shall scrutinize the log book once in every three months. At the end of each year, the candidate should summarize the contents and get the log book certified by the Head of the institution.

## **3. EXAMINATIONS**

### **3.1 Eligibility to appear for exams**

There shall be 80% attendance in theory and practical/clinical separately to appear for the University examination. The candidate must secure the minimum marks of 50% in internal assessment in theory and practical in a particular subject in order to be eligible to appear in the university examination of the subject.

### **3.2 Schedule of Regular/Supplementary exams**

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time.

Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of publication of results of regular examination.

### 3.3 Scheme of examination showing maximum marks and minimum marks

SUBJECT	THEORY		THEORY INTERNAL		PRACTICAL		PRACTICAL INTERNAL		VIVA		TOTAL	
	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Min.Marks for pass	Max Marks	Max Marks
Paper I Applied Basic Sciences	100	50	50	25	***	***	***	***	***	***	150	75
Paper II Physiotherapeutics	100	50	50	25	100	50	50	25	50	25	350	175
Paper III Paediatric Physiotherapy	100	50	50	25	100	50	50	25	50	25	350	175
Dissertation	APPROVED/NOT APPROVED								100	50	100	50

### 3.4 Papers in each year

As in 3.2

### 3.5 Details of theory exams

Question paper pattern for MPT theory examination

Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	20
Brief structured essay	10	6

### BROAD GUIDELINES

Paper	Subjects		Distribution of marks	Total marks
Paper I Applied Basic Sciences	1	Bio Statistics and Research Methodology	30	100
	2	Biomechanics and	30	

		Pathomechanics		
	3	Ergonomics	10	
	4	Nutrition and Exercise Physiology	30	
Paper II Physiotherapeutics	1	Manual therapy	25	100
	2	Exercise therapy	25	
	3	Electro therapy	25	
	4	Electrophysiology	25	
Paper III Paediatric Physiotherapy	1.	Anatomy and Physiology	15	100
	2.	Paediatrics Conditions	15	
	3.	Physical and functional diagnosis	30	
	4.	Physiotherapy interventions	40	

Structured Essay should be explanatory and brief structured Essay should be descriptive.

### 3.6 Model question paper for each subject with question paper pattern

#### MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION

#### PAPER I – APPLIED BASIC SCIENCES

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

#### I. Long Essay (2 x 20 = 40 marks)

1. Explain in detail about the functional adaptation of bone under pathological conditions.
2. Discuss about exercise in different altitudes and various climatic conditions.

#### II. Short notes: (10 x 6 = 60 marks)

1. Back care for physiotherapist in clinics
2. Job analysis
3. Energy expenditure during walking and running
4. Ergonomic modifications for a software professional
5. DOMS
6. Plyometrics
7. Pre-competition meal
8. Hallux valgus
9. Methods of sampling
10. Hypothesis testing

**MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION**

**PAPER II – PHYSIOTHERAPEUTICS**

**Q.P. Code:**

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order**

**I. Long Essay (2 x 20 = 40 marks)**

1. Describe the types of Mckenzie's syndromes, use of repeated movements in Mckenzie's method of spinal examination and explain the treatment principles for derangement syndrome
2. Explain in detail the neurophysiological principles and treatment principles of proprioceptive neuromuscular facilitation techniques. Describe about various proprioceptive neuromuscular facilitation techniques to improve stability

**II. Short notes (10 x 6 = 60 marks)**

1. Neural mobilization
2. EMG changes in peripheral neuropathies
3. Principles of Muscle Energy Techniques
4. Concave-convex rule and its importance in manipulation
5. Russian currents
6. Iontophoresis
7. Pain assessment
8. Functional Electrical Stimulation
9. Skin fold measurement
10. Close pack and loose pack position

**MASTER OF PHYSIOTHERAPY (MPT) DEGREE FINAL EXAMINATION**

**PAPER III – PAEDIATRIC PHYSIOTHERAPY**

**Q.P. Code:**

**Time: Three Hours  
marks**

**Maximum: 100**

**Answer ALL questions**

**I. Long Essay (2 x 20 = 40 marks)**

1. Discuss in detail about the PT management of 8 years old spastic diplegic cerebral palsy
2. What are the causes of brachial plexus injury in children? Describe the clinical features, complications and management of the same.

**II. Short notes (10 x 6 = 60 marks)**

1. Commando creeping
2. Down's syndrome
3. Leukemia
4. Postural reflexes
5. Grading of spasticity in children
6. Spina Bifida
7. Osteogenesis imperfecta
8. Immunisation schedule
9. Limb shortening
10. First day assessment of a new born

**3.7 Internal assessment component**

- a. There shall be a minimum of 3 periodic assessments, for theory and practical including viva separately, of which the final one shall be in the KUHS pattern and is mandatory.
- b. Average of the marks of the KUHS pattern examination and the best out of the remaining periodical assessments shall be taken as internal assessment mark of the candidate
- c. The class average of internal assessments mark of theory and practical should not exceed 75% of Maximum marks

d. The class average of internal assessment for an examination shall be calculated based on the total number of candidates in a particular batch appearing for that internal assessment examination.

e. The candidate must secure the minimum marks of 50% for internal assessment in theory, practical and viva voce in a particular subject order to be eligible to appear in the university examination of the subject.

### **3.8 Details of practical/clinical practicum exams**

#### **PRACTICAL 1 - Physiotherapeutics**

(Practical exam is emphasized only on Exercise, Electrotherapy and Manual Therapy)

- One long case - 60 marks
- One short case - 40 marks
- Viva - 50 marks

#### **PRACTICAL 2 – Paediatric Physiotherapy**

(Practical exam is emphasized only on Physiotherapy assessment and Interventions)

- One long case - 60 marks
- One short case - 40 marks
- Viva - 50 marks

### **3.9 Number of examiners (Internal & External) and their qualifications**

There will be two examiners for each subject where practical/ or viva to be conducted. One examiner (INTERNAL EXAMINER) is preferably from the same institution or as decided by the KUHS and the other examiner will be from another university (EXTERNAL EXAMINER). The examiners should have at least 5 years of teaching experience after post graduation.

#### **3.10 Details of viva:**

Wherever viva is prescribed the same will be conducted by the internal and external examiners appointed for practical examinations.

## **4 INTERNSHIP**

**Not applicable**

## **5 ANNEXURES**

**5.3 Check Lists for Monitoring:** Log Book, Seminar, Assessment etc. to be formulated by the curriculum committee of the concerned Institution