

SYLLABUS
FOR COURSES AFFILIATED TO THE
KERALA UNIVERSITY OF HEALTH SCIENCES
THRISSUR 680596



MASTER OF PHYSIOTHERAPY (MPT)
IN NEUROLOGY
Course Code: 294
(2024-2025 Academic year onwards)

2024

2. COURSE CONTENT

2.1 Title of course:

MASTER OF PHYSIOTHERAPY IN NEUROLOGY

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.

2.2 Medium of instruction:

Medium of instruction and examinations shall be in English.

2.3 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 neuosurgical 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.



2.4 Duration

The duration of the course shall be two years.

2.5 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 – Definition, concept, purpose, approaches
- Theory in Physiotherapy research
- History of physiotherapy research
- Present scenario
- Research ethics

2. Research design

- Research problems, questions and hypotheses
- Research paradigms
- Design overview
- Research validity
- Selection and assignment of subjects

3. Writing a research proposal/critiquing a research article

- Defining a problem
- Review of literature
- Formulating a question and operational definition
- Inclusion and Exclusion criteria
- Forming groups
- Data collection & analysis
- Results, Interpretation, Conclusion, Discussion
- Informed consent
- Limitations



4. Experimental designs

- Group designs
- Single system design

5. 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:
 - a. The basics
 - b. Advanced and special techniques
- Statistical analysis of relationship:
 - a. The basics
 - b. 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 Patho-mechanics of joints Unit:

1. Upper extremity



2. Lower extremity
3. Vertebral column
4. Thorax and chest wall
5. Temporomandibular joint

Part III: Biomechanics of integrated function

Unit:

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

Module III: Ergonomics

Units:

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



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

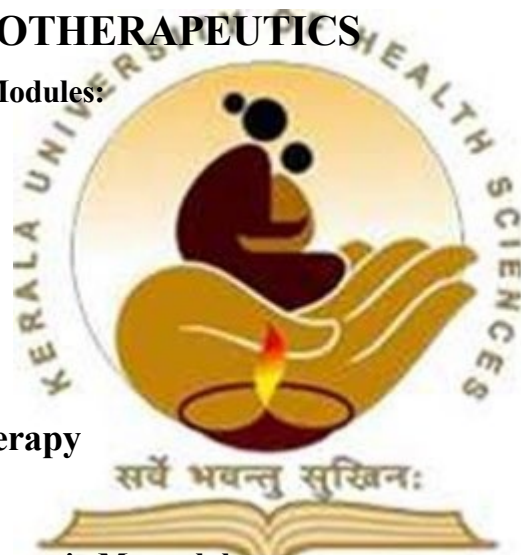
Unit:

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
6. Instrument-Assisted Soft Tissue Mobilization (IASTM)
7. Active Release Techniques (ART)



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. Ionotoporesis

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
5. Pulsed Electromagnetic Field Therapy PEMF (PEMF)



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 electro myography
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
- Motor development across lifespan
- Development and maturation of reflexes

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
11. EEG
12. REPEATED NERVE STIMULATION (RNS)

Part V

Common Clinical Manifestation of Neurological Disorders

Units

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
22. Down syndrome
23. Infectious diseases of nervous system
24. Tumors of Brain and spinal cord
25. Diseases of cranial nerves
26. Degenerative brain diseases



Module II

Physical and Functional Assessment

Units

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

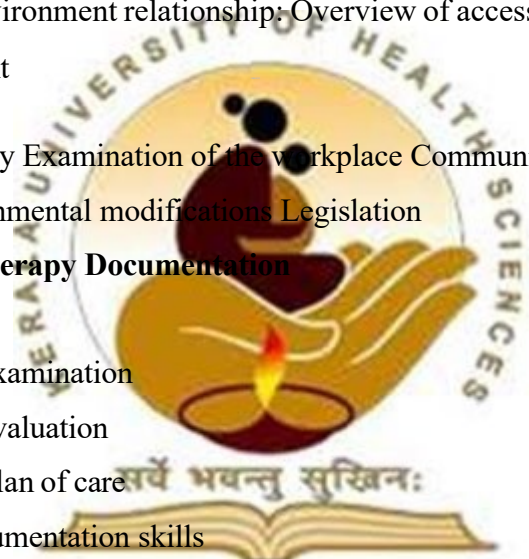
- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

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 perceptual function
 - Homonymous hemianopsia
 - Body scheme and body image disorders
 - Spatial relation syndrome
5. Assessment of speech and communication
6. Assessment of cranial nerve integrity
7. Assessment of vital signs
8. Assessment of autonomic nervous system function
9. Assessment of sensory integrity
 - Superficial sensation
 - Proprioceptive (Deep) sensation



- Combined cortical sensation

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
- Outcome measures used in neuro rehabilitation under ICF domains

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

4. Motor Priming techniques (tDCS, rTMS, action observation and imitation)

5. Brain computer interface

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
10. Prosthetics & Orthotics
11. Neural Mobilization

12. Vojta

13. LSVT big

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

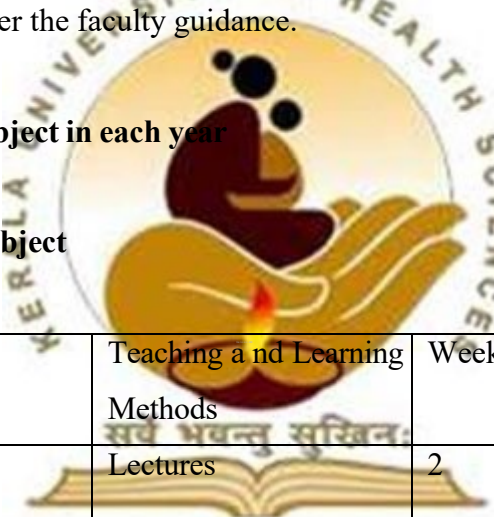
2.9 Teaching learning methods

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 Paper II: Physiotherapeutics Subjects: 1. Manual therapy	Lectures	2	180
	Seminars	2	180

2. Exercise therapy	Practicals and Demonstrations	4	360
3. Electro therapy			
4. Electrophysiology	Clinical Discussions	2	180
Paper III Neuro Physiotherapy			
Subjects:	Clinical Case Presentations	2	180
1. Anatomy and Physiology	Journal Club	2	180
2. Clinical condition			
3. Physiotherapy assessment	Class room teaching	1	90
4. Foundational concepts and condition management	Library	3	270
5. Special techniques	Clinical Training	15	1350
Synopsis & Dissertation work		3	210
Community Camps, Field Visits, Participation in Workshops & Conferences			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, 2nd edition (Lea and Febiger)
2. Kinesiology of the Human Body: Under Normal and pathological condition by Arthur Steindler, 5th edition (Charles C Thomas, 1977)
3. Joint Structure & Function :A comprehensive analysis by Cynthia C Norkin, Pamela K Levangie (Jaypee Brothers, 2006)
4. Brunnstrom's Clinical Kinesiology by Laura K. Smith & Don Lehmkuh, 5th edition (F A Davis, 1996)
5. The Physiology of the Joints by Kapandji & Matthew J Kendel (Churchill Livingstone, 2008)
6. Clinical Biomechanics of the Spine by Augustus A White & Manohar M Panjabi, 2nd Edition (Lippincott Williams & Wilkins; 1990)
7. Kinesiology :The mechanics and Pathomechanics of Human Movement by Carol Oatis (Lippincott Williams & Wilkins; 2008)
8. Kinesiology: Application to pathological motion by Soderberg, 2nd Edition (Wiliams & Wilkins, 1997)

Ergonomics

1. Industrial Therapy by Glenda L. Key, 1st 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 Livingstone)
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, 2nd edition (Pearson prentice hall 2006)
2. Physicals agents in rehabilitation: from research to practical by Michell H. Cameron, 2nd edition (Saunders and Elsevier, 2003)
3. Therapeutic Modalities for Allied Health Professionals by William E. Prentice and Frank Underwood (McGraw-Hill, 1998)

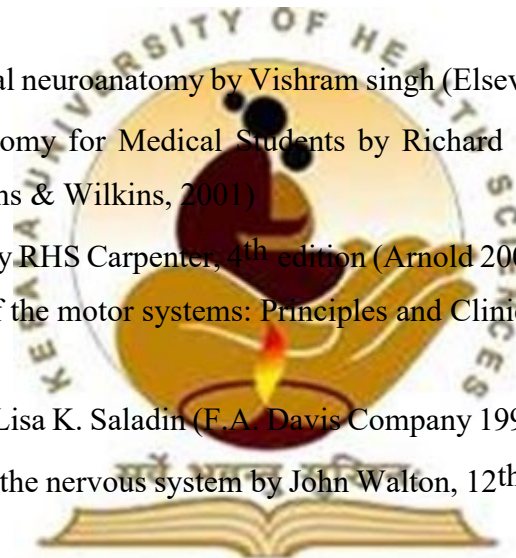


Electrophysiology

1. Electromyography in clinical practice by Michael J. Aminoff, 3rd edition (Churchill Livingstone)
2. Clinical neurophysiology by UK Misra and Kalita, 2nd edition (Churchill Livingstone)
3. Electro diagnosis in diseases of nerve and muscle: Principles and practice by Jun Kimura (Oxford university press)
4. The ABC of EMG: A practical introduction to Kinesiological electromyography by Peter Conrad (Noroxon Inc. USA 2005)
5. Integrating physical agents in rehabilitation by Bernadette Hecox and John Sanko, 2nd edition (Pearson prentice hall 2006)

Clinical Neurology

1. Text book of clinical neuroanatomy by Vishram singh (Elsevier 2007)
2. Clinical Neuroanatomy for Medical Students by Richard S Snell, 5th Edition (Lippincott Williams & Wilkins, 2001)
3. Neurophysiology by RHS Carpenter, 4th 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, 12th edition (Oxford University press)
6. A physiological approach to clinical neurology by James W. Lance and James G. McLeod, 3rd 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 Livingstone, 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& 5th 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, 3rd 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 Livingston 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, 2nd 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, 4th edition (Jaypee Wolf 1992)
7. Neurologic interventions for physical therapy by Suzanne Tink Martin and Mary Kessler, 2nd 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, 3 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, 2nd 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



NCAHCP accepted journals i.e. those included in:

- i. Medline
- ii. PubMed Central
- iii. Embase
- iv. Scopus
- v. Science Citation Index
- vi. Science Citation Index Expanded
- vii. Directory of Open Access Journals (DOAJ)

Scopus Indexed Journals in Physiotherapy

1. ACSM's Health and Fitness Journal.
2. Acute Pain
3. Advances in Medical Sciences
4. American Journal of Physical Therapy and Rehabilitation
5. Archives of Osteoporosis
6. Biology of Sport
7. Canadian Journal of Respiratory Therapy
8. Clinical Journal of Sports Medicine
9. Clinical Rehabilitation
10. European Journal of Pain Supplements
11. European Journal of Sport Science
12. European Review of Aging and Physical Activity.
13. Exercise and Sport Sciences Reviews
14. Family and Community Health
15. Foot and Ankle Clinics
16. Foot and Ankle International
17. International Journal of Adolescence and Youth
18. International Journal of Diabetes in Developing Countries
19. International Journal of Physiotherapy and Rehabilitation
20. Journal of Exercise Science and Fitness
21. Journal of Men's Health.
22. Journal of Musculoskeletal Research



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

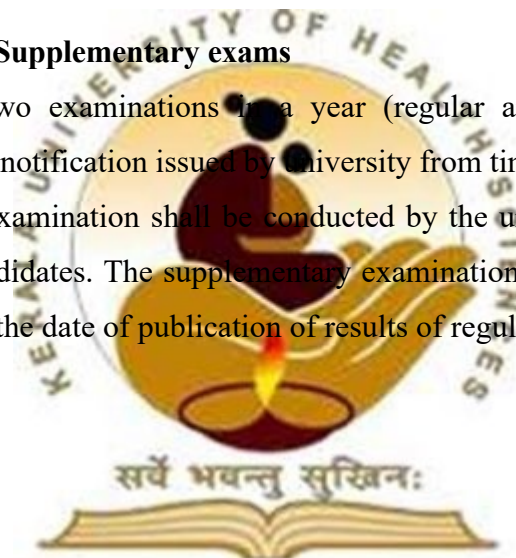
3.1 Eligibility to appear for exams

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	Min Marks for Pass
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

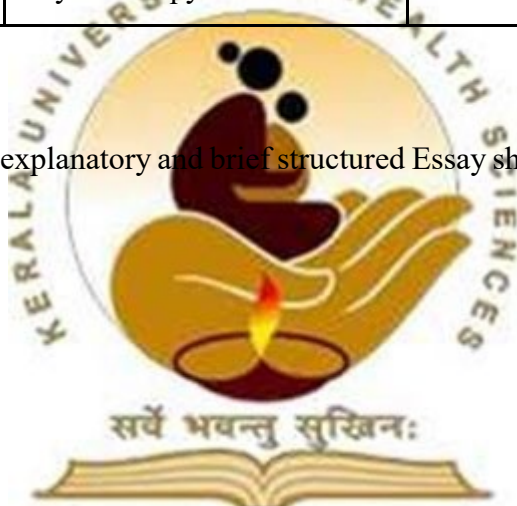
Subjects having maximum marks = 100		
Type of question	Number of questions	Marks for each question
Structured Essays	2	20
Brief structured essay	10	6

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 Physiotherapeutic s	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 Neurology	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
NEURO PHYSIOTHERAPY

Q.P. Code:

Time: Three Hours
marks

Maximum: 100

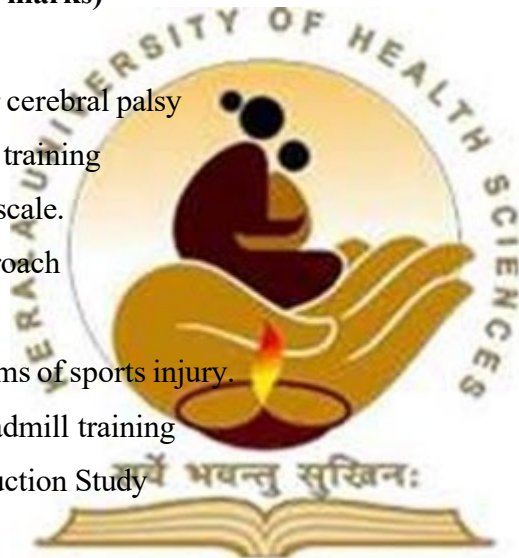
Answer ALL questions

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 amigos 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. Myasthenia 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

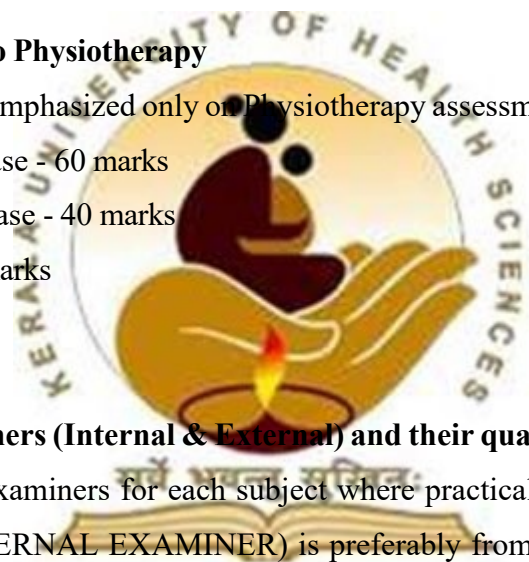
(Practical exam is emphasized only on Exercise and Electrotherapy)

- 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

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

