SYLLABUS

FOR

MASTER OF PHYSIOTHERAPY (M.P.T)

IN

CARDIOPULMONARY

M.P.T (CARDIOPULMONARY)

FIRST YEAR

1. Medical And Surgical Management of Disorders of the Cardiopulmonary system.	100
2. Physiotherapy Management in disorders of the Cardiopulmonary system – I	125
1.3 Physiotherapy Management in disorders of the Cardiovascular system – II	125
1.4 Physiotherapy Management in disorders of the Cardiovascular system – (Lab hours)	50
1.5 Research Methodology and Biostatistics	100
1.6 Seminars on Clinical Issues	100
Clinical Practice	1100
Total	**1700 hours**

SECOND YEAR

2.1 Pedagogy in Physiotherapy Education	100
2.2 Management, Administration and Ethical Issues	75
2.3 Biomechanics	150
2.3a Biomechanics (Lab Hours)	25
2.4 Dissertation	200
2.5 Seminars on Clinical Issues	100
Clinical Practice	1100
Total	**1750 hours**

MPT (CARDIOPULMONARY)

FIRST YEAR

M.P.T 1.1 **MEDICAL AND SURGICAL MANAGEMENT OF DISORDERS**

OF THE CARDIOPULMONARY SYSTEM

This course provides the student with in information on the epidemiology, Pathomachanics, clinical presentation, relevant diagnostic test and medical and surgical management of disorders of the cardiopulmonary system.

Student will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

Following are the topics to be included but not limited to:

CARDIOLOGY AND PULMONOLOGY

CARDIOLOGY

Epidemiology, Pathomechanics, clinical presentation, relevant diagnostic test (ECG, Echo cardiography, cardiac catheterization, Radionuclide scanning, stress testing, ABG, Labs etc.) and medical management of disorders of the cardiac system.

1. Assessment of symptoms of heart disease
2. Disorder of cardiac rate, Rhythm and condition
3. Cardiac Arrest
4. Cardiac failure
5. Shock
6. Rheumatic fever
7. Congenital heart disease
8. Disease of the heart valve
9. Infective Endocarditis
10. Ischemic heart disease
11. Hypertension
12. Orthostatic hypotension
13. CPR
14. Pericarditis
15. Heart disease in pregnancy
16. Degenerative arterial disease
17. Inflammatory arterial disease
18. Raynaud's disease
19. Venous thrombosis
20. Peripheral Vascular disease
21. Cardio myopathy
22. Disease of the pericardium

PULMONOLOGY

Epidemiology, pathomechanics, clinical presentation, relevant diagnostic tests (PFT, Labs etc.) and medical management of disorders of the pulmonary system.

1. Obstructive pulmonary disease
2. Infection of the Respiratory system
3. Interstitial and infiltrative pulmonary disorders
4. Pulmonary disorders due to exposure to Organic and inorganic pollutants.
5. Pulmonary disorders due to systemic inflammatory disease
6. Pulmonary vascular disease
7. Disease of pleura
8. Respiratory failure

9. Supplemental Oxygen and Oxygen delivery devices in Chronic Respiratory Disease.
10. Neuromuscular and Skeletal disorders leading to Global Alveolar Hypoventilation
    Myopathies
    Spinal muscular Artophies
    Poliomyelitis
    Motor Neuron Disease
    HSMN
    Kyphoscoliosis
    Pectus Carinatum
    Pectus Excavatum
11. Pathophysiology of paralytic – Restrictive pulmonary syndromes
12. Conventional Approaches to managing n-M-Ventilatory failure
13. Mechanical ventilation: Concept, Physiological effect and complications

CARDIOTHORACIC SURGERY

Surgical management of the above conditions, indication, contra-indications for surgery, precautions after surgery. Also included:

1. Close v/s open heart surgery
2. Incisions
3. Preoperative Assessment of Patient
4. Pre and post op blood gas exchange
5. Haemodynamic performance of CTVS Patients
6. Emergencies in CTVS
7. A-V Shunt
8. Heart Transplant
9. Left Ventricular Assistive devices
10. Procedure on Sternum, Chest wall, diaphragm, mediastinum, oesophagus
11. Cardiopulmonary Bypass
12. Maintaining and Removing Artificial Airways

(M.P.T.) 1.2 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE CARDIOPULMONARY SYSTEM-I

This course provide student with the principal of physiotherapy management in disorder of the cardiopulmonary system and the application of these principal in specific disorders. Through lecture, case conferences, journal discussion and class discussions students will be able to set up a treatment programme tailored to the patient's needs.

Following are the topics to be included but not limited to:

SECTION –I
GENERAL PRINCIPAL

1. P.T. Assessment
2. Mobilization and Exercises (Strengthening conditioning and endurance)
3. Body positioning
4. Airway Clearance Techniques
5. Postural Drainage
6. Forced Expiratory technique
7. Breathing Exercise
8. Percussion and vibration
9. Exercise training and Exercise testing
10. Bio feed back
11. Respiratory Muscle training
12. Ventilator
13. Humidification and Aerosol therapy
14. Applying and Evaluating Bronchial Hygiene therapy
15. outcomes of pulmonary Rehabilitation
16. Functional Adaptations
17. Prevention of Morbidity and Mortality with the use of physical aids
18. PT in ICU
19. Techniques for facilitating ventilatory pattern
20. Respiratory therapy equipment and adjuncts to Cardiopulmonary therapy
21. Principal and prescription of cardiac Rehabilitation
22. Principal and prescription of pulmonary Rehabilitation
23. PT in neonatal ICU
24. Diabetes and Exercise

SECTION - II
PHYSIOTHERAPY MANAGEMENT IN SPECIFIC CONDITIONS

Assessment and Management of condition as listed in (M.P.T) 1.1
M.P.T 1.3 P.T. Management in disorders of the Cardiopulmonary system-II
Topics as listed in (M.P.T) 1.1

(M.P.T) 1.4 PHYSIOTHERAPY MANAGEMENT IN DISORDERS OF THE CARDIOPULMONARY SYSTEM (LAB HOURS)

Students will be instructed via demonstration, hand of techniques, field visits and case conferences on specific techniques used in management of patients with neurological disorders.
Students will on their experiences at the clinical posting to formulate a treatment plan for cases presented at the case conference.

(M.P.T) 1.5 RESEARCH METHODOLOGY AND BIOSTATICS

Student will be provided an understanding of statistical measure used in the analysis and interpretation of research data. Information on research design and their implementation will be provided.

This course will be the student to read critique research articles and understand and apply the principles of research to perform a guided research as part of their course requirement. Following are the topics to be included but not limited to:

SECTION-I RESEARCH METHODOLOGY

1. How to read and critique research
2. Introduction to research: framework; levels of measurement; variables.
3. Basic research concept; validity and reliability
4. Design, instrumentation and analysis for qualitative research.
5. Design, instrumentation and analysis for quantitative research.
6. Design, instrumentation and analysis for quasi-experimental research
7. How to write a research proposal.
8. The use and Protection of Human and Animal Subjects.

SECTION-II BIOSTSTICS

1. Descriptive and Inferential statistics
2. Types of data: Qualitative and Quantitative
3. Frequency distribution
4. Describing data with Graphs
5. Describing data with Average Mode, Median, Mean.
6. Describing variability Variance, Standard deviation etc.
7. Normal Distributions
8. Interpretation of r
9. Hypothesis testing
10. T tests
11. ANOVA
12. Probability
13. Type I and Type II errors

14. Parametric and Non-Parametric tests
15. Which test to use.
16. Basic of computers-Hardware and software
17. Basic of Computer Applications-Windows, MS Word, Power Point etc.
18. Simple statistical Analysis using available software

(M.P.T) 1.6 SEMINARS ON CLINICAL ISSUES

These will serve as a platform for student to integrate components of patient management. Student will give presentations on topics provide to them.

CLINICAL PRACTICE

Student will engage in clinical practice in Physiotherapy Department in the neurological setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

M.P.T (CARDIOPULMONARY)
SECOND YEAR

(M.P.T) 2.1 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

This course will be provide students information on improving their teaching skills in the class room and clinical setting

Following are the topics to be included but not limited to:

1. Philosophy of education and emerging Issues in Education
    i. Meaning, Function and Aims of Education.
    ii. Formal, Informal and Non-formal Education.
    iii. Agencies of Education
2. Current Issues and trends in Higher Education
    i. Issue of quality in Higher Education, Autonomy and Accountability,
    ii. Privatization, Professional Development of Teachers, Education of
    iii. Person with Disabilities.
3. Need for Education Philosophy
    i. Some major Philosophies, Idealism Naturalism, Pragmatism and their
    ii. Implications for Education.
4. Concept of Teaching and Learning
    i. Meaning scope of Educational Psychology
    ii. Meaning and Relationship between Teaching and Learning
    iii. Learning Theories
    iv. Dynamics of Behaviour
    v. Individual Differences
5. Curriculum
    i. Meaning and concept
    ii. Basis of curriculum Formulation Development
    iii. Framing objective for Curriculum
    iv. Process of Curriculum Development and Factors Affecting Curriculum
    v. Development Evaluation of Curriculum
6. Method and Techniques of Teaching
    i. Lecture, Demonstration,
    ii. Discussion, Seminar, Assignment, Project and Case Study.
7. Planning for Teaching
    i. Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objective in Behavioral terms, Unit Planning and Lesson Planning.
8. Teaching Aids
    i. Types of teaching Aids
    ii. Principal of Selection, Preparation and use of Audio- Visual aids.
9. Measurements and Evaluation
    i. Nature of Educational Measurement: Meaning, Process, Types of Tests
    ii. Construction of an Achievement test and Analysis
    iii. Standardized Test.
    iv. Introduction of some Standardized tools, important tests of
    v. Intelligence, Aptitude, Personality.
    vi. Continuous and Comprehensive Evaluation.
10. Guidance and Counseling

i. Meaning and Concept of Guidance and Counseling
ii. Principles
iii. Guidance and Counseling Services of Personnel for P.T. Services

11. Clinical Education
    i. Awareness and Guidance to the Common People about Health and
    ii. Diseases and Available professional Services
    iii. Patient Education
    iv. Education of the Practitioners

(M.P.T) 2.2 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

This course deals with issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department.

Following are the topics to be included but not limited to:

MANAGEMENT

1 Function of management,
2 Evaluation of management through scientific management theory,
Classical theory
System approach
Contingency approach

2. Management process
   Planning, Organization, direction, controlling decision making
3. Introduction of personnel management
   Staffing recruitment selection, performance appraisal, collective Bargaining , discipline, job satisfaction
4. Quantitative methods of management
   Relevance of statistical and / or techniques in management
5. Marketing
   Market segmentation, marketing research production planning pricing, channels of distribution, promotion, consumer behaviour, licenser.
6. Total quality management
   Basic of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1 Hospital as an organization
Function and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy

department and dietary department.

1. Roles of Physiotherapist, Physiotherapy director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aids, occupational Therapist, Home health side, Volunteer.
2. Director care and referral relationship and confidentially.

LEGALPROFESSIONAL ETHICAL ISSUES

1. Physical Therapy: Definition and development
2. The implication & confirmation to the rules of professional conduct.
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.
4. Code of ethics
   A wider knowledge of ethics related to current social and medical policy in the previsions of health care.

5 Function of the relevant professional association education body and trade union.
6 The role of the international health agencies such as the world health organization.
7 Standard of practice for physical therapies.
8 Current Issues.

(M.P.T) 2.3 BIOMECHANICS

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

FUNDAMENTAL MECHANICS

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

KINEMATICS

1. Types of motion
2. Location of motion
3. Magnitude of motion
4. Direction of motion

5. Angular motion and its various parameters
6. Linear motion and its various parameters
7. Projectile motions

KINETICS

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

FLUID MECHANICS

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

BONE MECHANICS

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

MUSCLES MECHANICS

1. Structure & composition of muscles
2. Fiber length & cross section area
3. Mechanical propertied
4. EMG changes during fatigue & contraction
5. Changes in mechanical properties because of ageing and Exercise & Immobilization.
6. Clinical applications

LIGAMENT & TENDON MECHANICS

1. Structure and composition
2. Mechanical properties
3. Cross section area measurements
4. Muscle tendon properties
5. Temperature sensitivity
6. Changes in mechanical properties because of ageing exercise and immobilization.
7. Mechanoreceptors
8. Clinical application

JOINT MECHANICS

1. Joint Design
2. Joint Categories
3. Joint Functions
   - Arthokinematics
   - Osteokinematics
   - Finamatics chair
4. joint forces, equilibrium & distribution of these forces
5. joint Stability & its mechanism
6. Articular Cartilage Machanics
7. Clinical application

MEASUREMENT INSTRUMENT

1. Goniometer
2. Accelerometer
3. Photo optical devices
4. Pressure transducers and force plates
5. Gait Analyzer
6. Isokinetic Device
7. EMG

   Electro physiology of muscle contraction
   Recording
   Processing
   Relationship between EMG and Bio-mechanical variables

MECHANICAL ENERGY WORK AND POWER

1. Definition
2. Positive and Negative work of muscle
3. Muscle of mechanical power
4. Causes of inefficient movement
   - Co-contraction
   - Isometric contraction
   - Energy generation at one joint and absorption at another
   - Energy flow
5. Energy storage

ERGONOMICS

BIOMECHANICS IN CARDIOPULMONARY CONDITIONS

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

APPLICATION OF BONE AND JOINT MECHANICS

Load sharing & load transfer
Prosthetic design criteria
Bio-mechanical analysis of implants internal fixations
Degenerative changes in weight bearing joints & compensatory action

GAIT

1. Gait parameter
   - Kinetic
   - Kinematic
   - Time-Space
2. Pathological gait
3. Running
4. Stair climbing
5. Changes in gait following various surgeries/ diseases/ disorders

ORTHOSIS & PROSTHOSIS

1. Orthosis of spine
2. Orthosis of upper limb
3. Orthosis of lower limb
4. Prescriptions checkout & proper fitting
5. Bio-mechanical principles governing them
6. Aids used in management of disability

CARDIOPPULMONARY MECHANICS

1. Rheology
2. Cardiac Mechanics
3. Pulmonary Mechanics
4. Rib Cage Movement

(M.P.T) 2.4 BIOMECHANICS IN CARDIOPULMONARY CONDITIONS (LAB HOURS)

This involves application of topics in M.P.T 2.4 via demonstrations, field visit and case presentation.

(M.P.T) 2.5 THESIS (DISEERTATION)

As part of requirement for the master's degree the student is required to undertake a research study under the guidance of a guide.

Issues of Cardiopulmonary disorder may be studied on patients or normal individuals.

(M.P.T) 2.6 SEMINARS ON CLINICAL ISSUES

These will serve as a platform for student to integrate various components of patient management. Students will give presentations on topics provided to them.

CLINICAL PRACTICE

Students will engage in clinical in Cardiopulmonary Physiotherapy Department setting to enhance their clinical skill and apply theoretical knowledge gaining during teaching sessions.