SYLLABUS

FOR

MASTER OF PHYSIOTHERAPY

M.P.Th. FIRST YEAR

(CARDIOPULMONARY)
M.P.Th. (CARDIOPULMONARY)

The M.P.Th. (Cardiopulmonary) program is directed towards the attainment of specific goals and objectives that emanate from the principles expressed in the following statement:

"Physical therapy is a health profession whose primary purpose is the promotion of optimal human health and function through the application of scientific principles to prevent, examine, evaluate and intervene in order to alleviate acute or prolonged movement dysfunction through evidence-based practice."

The students are prepared for future professional and societal obligations such as providing leadership and contributing to both the growth of the profession, and the clinical research agenda through the development and application of principles and practices of professional discipline, clinical decision making, education, leadership, management and research. Students will be prepared to carry out the expanding responsibilities of physical therapists in preventative, evaluative, maintenance, acute care and rehabilitation settings, and in education, consultative and research environments. Critical thinking and a commitment to research will be encouraged. Students with an aspiration to teach and a commitment to research will be guided to achieve the following:

- Knowledge and skill in instructional design, teaching methods and evaluation
- Knowledge and skill in research methods, design, implementation, analysis, and communication of Results.
- Socialization to the role of a faculty member, awareness of academic responsibilities, and sensitivity to the needs of the learner.
M.P.Th. 101C: BASIC HEALTH SCIENCES

This course provides students an increased understanding of the functions of the cardiopulmonary system in disease and in health with an emphasis on current findings in the respective areas. Through a study of pharmacology students will be provided information on the principles guiding the prescription of medications and their effects, side effects and influence on exercise when administered in disorders of the cardiopulmonary systems.

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

ANATOMY
1. Coronary Circulation
2. Structure of the Myocardium
4. Anatomy of the Upper and Lower Respiratory Tract
5. Bronchopulmonary Segments.

PHYSIOLOGY
1. Cardiac Physiology and Circulation
   - Physiology of Cardiac Muscle
   - Cardiac Cycle
   - Regulation of Cardiac Cycle
   - Rhythmic Excitation of the Heart
   - Blood Pressure
   - Blood Gas Exchange
   - Local Control of Blood Flow
   - Heart Sounds
   - Control of arterial Pressures
2. Respiration
   - Pulmonary Volumes and Capacities
   - Principles of Gas Exchange
   - Regulation of respiration
   - Mechanisms of Respiration
3. Body Fluids and Kidney
   - Oedema
   - Capillary Dynamics
• Osmotic Equilibrium between ICF and ECF

PATHOLOGY
1. CVS
   • Diseases of CVS
2. Hematological System
   • Blood transfusion
   • PVD
3. Respiratory System
   • Restrictive Lung Disease
   • Obstructive Lung disease
   • Environmental and Occupational Disease

PHARMACOLOGY
1. Pharmacokinetics.
2. Anti-Anaemic
3. Anti-Coagulants
4. Thrombolytic Agents
5. CV Drugs
   • Cardiac Glycosides
   • Anti-Anginal
   • Peripheral Vasodilators
   • Anti-HTN
   • Anti-Arrhythmic
   • Anti-Hyperlipidaemic and Hypocholesterolaemic
6. Drugs Affecting Respiratory System
7. Hormones
   • Insulin
   • Steroids
8. Diuretics

Suggested Readings
1. Gray’s Anatomy
2. Pharmacology in Rehabilitation. Ciccone
3. Clinical Anatomy – Snell
4. Boyd’s Textbook of Pathology – A. C. Ritchie
M.P.Th.102C: MEDICAL AND SURGICAL MANAGEMENT OF DISORDERS OF THE CARDIOPULMONARY SYSTEM

This course provides the student with information on the epidemiology, pathomechanics, clinical presentation, relevant diagnostic tests and medical and surgical management of disorders of the cardiopulmonary system. An overview of diagnostic imaging techniques is presented, with special emphasis on the role of the physiotherapist in using imaging within the scope of physiotherapy and to plan physiotherapy care. Students 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:** Epidemiology, Pathomechanics, Clinical presentation, Relevant diagnostic tests (ECG, Echocardiography, 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. Disorders of Cardiac Rate, Rhythm and Conduction
3. Cardiac Arrest
4. Cardiac Failure
5. Shock
6. Rheumatic Fever
7. Congenital Heart Disease
8. Diseases of the Heart Valves
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. Cardiomyopathy
22. Diseases 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 Diseases
2. Infections 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 Diseases
7. Diseases of the 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 Atrophies
   - 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

CARDIOTHORACIC SURGERY: Surgical management of the above conditions, indications, contraindications for surgery, precautions after surgery.
1. Haemodynamic Performance of CTVS Patients
2. A-V Shunt
3. Procedures on Sternum, Chest Wall, Diaphragm, Mediastinum, Oesophagus.
4. Cardiopulmonary Bypass
5. CTVS Procedures: Outline and Definition Of Procedures, Differences In Open And Closed Heart Surgery, Recent Advances Like MIDCAB, OPCAB, Heart-Port, Etc.


7. Extra-Corporeal Circulation: Techniques

8. Cardiopulmonary Bypass: Pathophysiology and Introduction to OPCAB

9. Emergencies in CTVS

10. LV Assist Devices

11. Heart Transplant

12. Complications of Cardiac Surgery (Thrombo-Embolism in Brain, Lungs and Distal Vessels, Phrenic Nerve Injuries, Unstable Sternum and Implication Of Procedures Like Omentoplasty, Etc.)

13. Preoperative Assessment of Patients

14. Haemodynamic Monitoring In CTVS Patients

15. Respiratory Physiology In Relation To Concept of Shunt and Dead Space And Exchange Of Gases.

16. Interpretation of Arterial Blood Gases

17. Oxygen Therapy

18. Maintaining and Removing Artificial Airways

19. Post-Op Mechanical Ventilation

20. Non Invasive Positive Pressure Ventilation

Suggested Readings


2. Hurtz

3. Principles and Practice Of Medicine. Davidson


5. Cardiology. Julian
M.P.Th. 103: EXERCISE TESTING AND PRISCIPTION

Scientific Foundations for Exercise Testing and Prescription
- Functional Anatomy
- Biomechanics
- Exercise Physiology
- Physiologic Effects of Aging and Deconditioning

Lifestyle Factors Associated with Health and Disease
- Factors Associated with Increased Risk of Coronary Heart Disease
- General Overview of Pre-Participation Health Screening and Risk Assessment
- Physical Activity Status and Chronic Diseases
- Physical Activity Assessment
- Relationship of Nutrition to Chronic Diseases
- Assessment of Dietary Intake
- The Influence of Emotional Distress On Chronic Illness

Physical Fitness, Clinical, and Diagnostic Assessments
- Body Composition
- Muscular Fitness
- Clinical Exercise Testing Related to Cardiovascular Disease
- Assessment and Limitations Associated with Pulmonary Disease
- Exercise Testing in Patients with Diabetes
- Clinical Exercise Testing in Individuals with Disabilities Due to Neuromuscular Disorders
- Occupational and Functional Assessments
- Diagnostic Procedures for Cardiovascular Disease
- Dysrhythmias and Selected Conduction Defects
- Myocardial Ischemia and Infarction

Exercise Prescription, Exercise Programming and Adaptations to Exercise Training
- Cardiopulmonary Adaptations to Exercise
- Adaptations to Resistance Training
- Principles of Cardiorespiratory Endurance Programming
- Principles of Musculoskeletal Exercise Programming
- Weight Management
Applied Exercise Programming
Medical Considerations

Exercise Testing and Training for Individuals with Chronic Disease
- Pathophysiology and Clinical Features of Cardiovascular Diseases
- Treatment of Cardiovascular Disease
- Exercise Training in Patients with Cardiovascular Disease
- Treatment and Rehabilitation of Pulmonary Diseases
- Diabetes Mellitus and Exercise
- Exercise in Patients with End Stage Renal Disease
- Osteoporosis and Exercise
- Arthritis Diseases and Conditions
- Neuromuscular Diseases and Exercise
- Immunological Conditions

Human Behavioral Principles Applied to Physical Activity
- Principles of Health Behavior Change
- Channels for Delivering Behavioral Programs
- Factors Associated with Regular Physical Activity Participation
- Behavioral Strategies to Enhance Physical Activity Participation
- Psychopathology
- Health Counseling Skills

Exercise Program Administration.
- The Exercise Program Professional and Related Staff
- Health and Fitness Program Development and Operation
- Clinical Exercise Program Development and Operations
- Financial Considerations
- Policies and Procedures for Program Safety and Compliance
- Legal Considerations

Prescribed books
2. Exercise training and exercise prescription for special cases. Theoretical basis and clinical application by James A. Skinner, Lippincott Williams and Wilkins
This course will enable the student to read and critique research articles and understand and apply the principles of research to perform a guided research as part of their course requirement. Students will be provided an understanding of statistical measures used in the analysis and interpretation of research data. Research designs and their implementation will be discussed.

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

1. **Research Fundamentals**
   - Methodological of Theory Evaluating Theory.

2. **Research Design**
   - Research Validity Internal Validity Construct Validity External Validity Relationships among Types of Validity.
   - Selection and Assignment of Participants Significance of Sampling and Assignment Populations and Samples Probability Sampling Nonprobability Sampling Assignment to Groups Sample Size.
3. Experimental Designs
   - Group Designs
     Randomized Controlled Trials
     Single-Factor Experimental Designs
     Multiple-Factor Experimental Designs.
   - Single-System Design Problems with Group Designs
     Characteristics of Single-System Designs
     Single-System Designs
     Limitations of Single-System Designs.

4. Nonexperimental Research
   - Overview of Nonexperimental Research
     Description Analysis of Relationships
     Analysis of differences.
   - Clinical Case Reports
     Contributions of Case Reports to Theory and Practice
     Purposes of Case Reports
     Format of Case Reports.
   - Qualitative Research
     Assumptions of the Qualitative Paradigm
     Qualitative Designs
     Qualitative Methods.
   - Epidemiology
     Ratios, Proportions, and Rates
     Screening and Diagnosis
     Nonexperimental Epidemiological Designs.
   - Outcomes Research
     Purpose of Outcomes Research
     Frameworks for Outcomes Research
     Measurement Tools for Outcomes Research
     Design Issues for Outcomes Research.
   - Survey Research
     Scope of Survey Research
     Types of Information
     Types of Items
     Implementation Overview
     Mailed Surveys
     Internet Surveys
     Interview Surveys

5. Measurement
   - Research Reliability
     Designs Validity
     Designs Responsiveness Design

6. Data Analysis
   - Statistical Reasoning
     Data Set
     Frequency Distribution
     Central Tendency
     Variability
     Normal Distribution
     Sampling Distribution
     Significant Difference
     Errors
     Power Statistical Conclusion
     Validity.
   - Statistical Analysis of Differences: The Basics
     Distributions for Analysis of Differences
     Assumptions of Tests of Differences
     Independence or Dependence of Samples
     Steps in the Statistical Testing of Differences
     Statistical Analysis of Differences.
   - Statistical Analysis of Differences: Advanced and Special Techniques
     Advanced ANOVA Techniques
     Differences Between More Than One Independent Variable
     Analysis of Single-System Designs
     Survival Analysis
     Hypothesis Testing with Confidence Intervals
     Power Analysis.
7. Being a Consumer
   - Locating the Literature Types of Information Types of Professional Literature Focused Literature Search Ongoing Literature Search Obtaining Literature Items.
   - Synthesizing Bodies of Evidence Reasons to Synthesize the Literature Ways to Synthesize the Literature Preparing for a Systematic Review Synthesizing the Literature Reporting on Systematic Reviews

8. Implementing Research
   - Implementing a Research Project Proposal Preparation Human Participants Protection Funding Obtaining Participants Data Collection Data Analysis.
   - Publishing and Presenting Research Publication of Research Presentation of Research

**Suggested Readings**

1. *Handbook of Research in Physical Therapy*. CE Bork
3. *Research Methodology for Physical Therapists*. C Hicks
M.P.Th. 105: SEMINARS ON CLINICAL ISSUES

These will serve as a platform for students to integrate various components of patient management and debate contentious issues in the efficacy of Physiotherapy techniques. Students will give presentations on topics provided to them.
M.P.Th. 106C: PHYSIOTHERAPY I
THERAPEUTIC PRINCIPLES AND PRACTICE IN CARDIOPULMONARY PHYSICAL THERAPY

Objectives: This course provides students with the principles of Physiotherapy management in disorders of the cardiopulmonary system and the application of these principles in specific disorders. Through lectures, case conferences, journal discussions and class discussions students will be able to set up a treatment programme tailored to the patient’s needs.

- Analyze the multifaceted aspects of the clinical problem and appreciate a multifaceted approach to evaluation and treatment.
- Identify treatment approaches and their appropriate match with clinical problems.
- Recognise the role of the Physiotherapist in helping the patient reach his or her optimal level of functional independence within their environment.

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

GENERAL PRINCIPLES
1. P.T. Assessment
2. Mobilization And Exercises (Strengthening, Conditioning And Endurance)
3. Body Positioning
4. Airway Clearance Techniques
   - Postural Drainage
   - Forced Expiratory Techniques
   - Breathing Exercises
   - Percussion And Vibration
5. Respiratory Muscle Training
6. Biofeedback
7. Ventilator
8. Humidification And Aerosol Therapy
9. Applying And Evaluating Bronchial Hygiene Therapy
10. Physiotherapy In The Intensive Care Unit
11. Techniques For Facilitating Ventilatory Pattern
12. P.T. In Neonatal I.C.U.
13. Respiratory Therapy Equipment And Adjuncts To Cardiopulmonary Therapy
PHYSIOTHERAPY MANAGEMENT IN SPECIFIC CONDITIONS

1. Congenital Heart Disease
2. Diseases of the Heart Valves
3. Ischemic Heart Disease
4. Hypertension
5. Orthostatic Hypotension
6. Heart Disease in Pregnancy
7. Peripheral Vascular Disease
8. Cardiomyopathy
9. Obstructive Pulmonary Diseases
10. Infections of the Respiratory System
11. Interstitial and Infiltrative Pulmonary Disorders
12. Pulmonary Disorders Due To Exposure to Organic and Inorganic Pollutants
13. Pulmonary Disorders Due To Systemic Inflammatory Disease
14. Pulmonary Vascular Diseases
15. Diseases Of The Pleura
16. Respiratory Failure
17. Supplemental Oxygen And Oxygen Delivery Devices In Chronic Respiratory Disease
18. Neuromuscular And Skeletal Disorders Leading To Global Alveolar Hypoventilation
19. Patho-physiology Of Paralytic-Restrictive Pulmonary Syndromes
20. Incisions
21. Pre and Post Operative Blood Gas Exchange
22. Hemodynamic Performance Of CTVS Patients
23. Emergencies In CTVS
24. Heart Transplant
25. Left Ventricular Assistive Devices

Suggested Readings

1. Principles And Practice Of Cardiopulmonary Physiotherapy. D Frownfelter, E Dean
2. Respiratory Care. Shapiro
3. Clinical Practice In Respiratory Care. J Fink, Ge Hunt
4. Physiotherapy For Respiratory And Cardiac Problems. J Pryor, A Prasad
5. Cardiopulmonary Physical Therapy. S Irwin, Sadowsky
6. Chest Physiotherapy In The ICU. Mackenzie
MPTH107C: PHYSIOTHERAPY-I PRACTICAL

THERAPEUTIC PRINCIPLES AND PRACTICE IN CARDIOPULMONARY PHYSIOTHERAPY

Students will be instructed via demonstrations, hands on techniques, field visits and case conferences on specific techniques used in management of patients with cardiopulmonary disorders.

Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.
SYLLABUS
FOR
MASTER OF PHYSIOTHERAPY
M.P.Th. SECOND YEAR
(CARDIOPULMONARY)
This course deals with basic issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department.

It provides the student with an introduction to ethical issues facing physiotherapists. Specific topics include documentation. A variety of current issues affecting the physiotherapy profession are addressed in this course. The science of management is presented as it relates to the essential functions of the business of physiotherapy. The education module of this course will provide students information on improving their teaching skills in the classroom and clinical setting. Educational theory is presented. Students develop and present educational units to audiences that may include Bachelor of Physiotherapy students or peers.

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

**MANAGEMENT**

3. Introduction to Personal 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 Behavior, and Licensor  

**ADMINISTRATION**

1. Hospital As An Organization - Functions And Types Of Hospitals Selected Clinical Supportive And 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 And Dietary Department
2. Roles Of Physiotherapist, Physiotherapy Director, Physiotherapy Supervisor, Physiotherapy Assistant, Physiotherapy Aide, Occupational Therapist, Home Health Aide, Volunteer.

3. Direct Care and Referral Relationships and Confidentially.

LEGAL PROFESSIONAL ETHICAL ISSUES
1. Physiotherapy: Definition and Development.
2. The Implications & Conformation to the Rules of Professional Conduct.
3. Legal Responsibility for Their Actions in the Professional Context and Understanding the Physiotherapist’s Liability And Obligations In The Case Of Medical Legal Action.
4. Code of Ethics
6. Functions of the Relevant Professional Associations Education Body and Trade Union.
7. The Role of the International Health Agencies Such as the World Health Organizations.
8. Standards of Practice for Physiotherapists

Suggested Readings
1. Basic Management. Trivedi
3. Hospital Administration. Sundaran
4. Byelaws of the Delhi Council for Physiotherapy and Occupational Therapy

EDUCATION
1. Philosophy of Education and Emerging Issues in Education: Meaning, Functions and Aims of Education,
2. Concept of Teaching and Learning: Meaning And Scope Of Educational Psychology, Meaning And Relationship Between Teaching And Learning, Learning Theories, Dynamics Of Behavior, Individual Differences
5. Planning for Teaching: Bloom’s Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioral Terms. Unit Planning and Lesson Planning.
6. Teaching Aides: Types of Teaching Aides, Principles of Selection, Preparation, and Use of Audio-Visual Aides.
8. Guidance And Counseling: Meaning And Concepts Of Guidance And Counseling, Principles, Guidance And Counseling Services For Students And Faculty Members, Faculty Development And Development Of Personnel For P.T. Services

Suggested Readings
2. Philosophical Foundation of Education – Srinibas Bhattacharya
3. Sociological Foundation of Education – Srinibas Bhattacharya
4. Psychological Foundation of Education – Srinibas Bhattacharya
M.P.Th. 202: BIOMECHANICS

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

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

1. **Fundamental Mechanics**
   a) Forces
   b) Moments
   c) Newton's Lows
   d) Composition And Resolution Of Forces
   e) Static Equilibrium
   f) Dynamic Equilibrium
   g) Force Systems
   h) Levers
   i) Pulley Systems
   j) Density & Mass
   k) Segmental Dimensions
   l) Stress And Strain
   m) Modulus of Rigidity and Modulus of Elasticity
   n) Poisson’s Effect
   o) Strain Energy
   p) Static and Cyclic Load Behaviors
   q) Load
   r) Load Sharing and Load Transfer

2. **Kinematics**
   a) Types of Motion
   b) Location of Motion
   c) Magnitude of Motion
   d) Direction of Motion
   e) Angular Motion and Its Various Parameters
   f) Linear Motion and Its Various Parameters
   g) Projectile Motions
3. Kinetics
   a) Definition of Forces
   b) Force Vectors
   c) Naming of Force
   d) Force of Gravity & COG
   e) Stability
   f) Reaction Forces
   g) Equilibrium
   h) Linear Forces System
   i) Friction and Its Various Parameters.
   j) Parallel Force Systems
   k) Concurrent Force Systems
   l) Work Powers & Energy
   m) Moment Arms of Force
   n) Force Components
   o) Equilibrium of Force

4. Muscles Mechanics
   a) Structure & Composition of Muscle
   b) Fiber Length & Cross Section Area
   c) Mechanical Properties
   d) EMG Changes during Fatigue & Contraction.
   e) Changes in Mechanical Properties because of Ageing and Exercised & Immobilization.
   f) Clinical Applications

5. Ligament & Tendon Mechanics
   a) Structure and Composition
   b) Mechanical Properties
   c) Cross Sectional Area Measurements
   d) Muscle Tendon Properties
   e) Temperature Sensitivity
   f) Changes in Mechanical Properties because of Aging, Exercise and Immobilization
   g) Mechanoreceptors
h) Clinical Applications

6. Joint Mechanics
   a) Joint Design
   b) Joint Categories
   c) Joint Functions
   d) Arthrokinematics
   e) Osteokinematics
   f) Kinematic Chairs
   g) Joint Forces, Equilibrium & Distribution of These Forces
   h) Degenerative Changes In Weight Bearing Joints & Compensatory Actions
   i) Joint Stability & Its Mechanisms
   j) Clinical Applications

7. Measurement Instruments
   a) Goniometer
   b) Accelerometer
   c) Photo Optical Devices
   d) Pressure Transducers & Force Plates
   e) Gait Analyzer
   f) Isokinetic Device
   g) EMG
   h) Electrophysiology of Muscle Contraction
   i) Recording
   j) Processing
   k) Relationship between EMG and Biomechanical Variables

8. Mechanical Energy, Work & Power
   a) Definitions
   b) Positive and Negative Work of Muscles
   c) Muscle Mechanical Power
   d) Causes of Inefficient Movement
   e) Co-Contractions
   f) Isometric Contraction Against Gravity Jerky Movement
g) Energy Generation at one Joint and Absorption at another
h) Energy Flow
i) Energy Storage

9. Posture and Gait
   a) Posture-
      i. Standing
      ii. Sitting
   b) Pathokinesiology
   c) Gait Parameter
   d) Kinetic
   e) Kinematic
   f) Time – Space
   g) Pathological Gait
   h) Running
   i) Stair Climbing
   j) Changes in Gait Following Various Surgeries /Diseases / Disorders.

10. Orthosis & Prosthesis
    a) Orthosis of Spine
    b) Orthosis of Upper Limb
    c) Orthosis of Lower Limb
    d) Prescriptions Checkouts & Proper Fittings
    e) Biomechanical Principles Governing them
    f) Aids Used In Management of Disability

Kinesiology

1. Arthrology and Arthrokinematics, Kinetics, Pathokinesiology
   a) Shoulder
   b) Elbow
   c) Wrist and Hand
   d) Hip
   e) Knee
   f) Ankle and Foot
g) Trunk
h) Respiration

2. Cardiopulmonary Mechanics
   a) Cardiac Mechanics
   b) Pulmonary Mechanics
   c) Vascular Mechanics

Suggested Readings:
1. Biomechanics of Human Movement. D Winter
2. Kinesiology: Application to Pathological Motion. GL Soderberg
3. Brunnstrom’s Clinical Kinesiology. LK Smith, EL Weiss, LD Lehmkuhl
4. Kinesiology.: Scientific Basis of Human Motion. K Lutgens, N Hamilton
M.P.Th. 203: SEMINARS ON CLINICAL ISSUES

These will serve as a platform for students to integrate various components of patient management and debate contentious issues in the efficacy of Physiotherapy techniques. Students will give presentations on topics provided to them.
As part of the requirement for the Master’s degree the student is required to undertake a research study under the guidance of a guide. Issues of musculoskeletal disorders may be studied on patients or normal individuals.
UNIT I - EXERCISE TESTING

1. Pre-test clinical evaluation
   a) Medical history, physical examination, and laboratory tests
   b) Alternative stress tests
   c) Blood pressure
   d) Cholesterol and lipoproteins
   e) Blood profile analyses
   f) Pulmonary function
   g) Contraindication of exercise testing
   h) Informed consent
   i) Patient instruction

2. Physical fitness testing and interpretation
   a) Purpose of fitness testing
   b) Basic principles and guidelines
   c) Body composition

3. Cardiopulmonary fitness
   a) Concept of maximal oxygen uptake
   b) Maximal verses sub-maximal exercise testing
   c) Modes of testing
   d) Cardiopulmonary test sequence and measures
   e) Test termination criteria

4. Clinical exercise testing
   a) Indication and applications
   b) Diagnostic exercise testing
   c) Exercise testing for disease severity and progression
   d) Exercise testing after myocardial infarction
   e) Functional exercise testing
   f) Exercise test modalities
   g) Exercise protocols
h) Upper body exercise testing  
i) Testing for return to work  
j) Measurements  
   ● Heart rate  
   ● Blood pressure  
   ● Expired gases  
   ● Electro-cardiographic monitoring  
   ● Subjective ratings  
k) Post exercise period  
l) Indication for exercise test termination  
m) Exercise testing with imaging modalities  
   ● Exercise echocardiography  
   ● Exercise nuclear imaging  
   ● Pharmacological stress testing  
n) Consideration for pulmonary patients  
   ● Lung function  
   ● Exercise testing of pulmonary patients  

5. Interpretation of clinical test data  
   a) Exercise testing as a screening tool for coronary artery disease  
   b) Interpretation of response to graded exercise testing  
   c) Maximal oxygen uptake  
      ● Heart rate response  
      ● Blood pressure response  
      ● ECG wave forms  
      ● Symptoms  
   d) Diagnostic value of exercise testing  
      ● Sensitivity  
      ● Specificity  
      ● Predictive value  
      ● Comparison with imaging stress tests  
      ● Prognostic application of exercise test  
   e) Interpretation of exercise tests in pulmonary patients
UNIT II - CARDIAC REHABILITATION

Overview: Major Manifestations of Heart Disease & cardiac rehabilitation

a) Coronary Heart Disease  
b) Valvular Heart Disease  
c) Peripheral vascular disease  
d) Definition of cardiac rehabilitation  
e) Phases of cardiac rehabilitation  
f) Outcome measures in cardiac rehabilitation

I. Development, Intervention, and Prevention of Coronary Artery Disease

1. Atherosclerosis  
a) Process of Plaque Formation  
b) Acute Coronary Syndromes

2. Contemporary Revascularization Procedures  
a) Coronary Arteries and CAD  
b) Coronary Artery Bypass Surgery  
c) Percutaneous Coronary Interventions

3. Efficacy of Secondary Prevention and Risk Factor Reduction  
a) Cardiac Rehabilitation  
b) Prescription Drug Therapies  
c) Smoking  
d) Dyslipidemia  
e) Diabetes Mellitus  
f) Obesity  
g) Hypertension  
h) Sedentary Lifestyle  
i) Psychosocial Dysfunction  
j) Other Risk Factors  
k) Optimizing Secondary Prevention

4. Psychosocial Issues and Strategies  
a) Psychosocial Evaluation  
b) Psychosocial Interventions  
c) Promoting Adherence
II. Role of Exercise in Heart Disease

1. Exercise and the Coronary Heart Disease Connection
   a) Observational Data
   b) Cardiorespiratory Fitness and Coronary Death
   c) Exercise Training in Established Coronary Disease
   d) Risks of Acute Exercise
   e) Potential Mechanisms of Exercise Benefit

2. Cardiovascular and Exercise Physiology
   a) Energy Systems and Cellular Respiration
   b) Cardiopulmonary Response
   c) Perturbation of the Exercise Response in CVD
   d) Adaptations to Exercise Training

3. Exercise Prescription
   a) Mode
   b) Intensity
   c) Frequency
   d) Duration
   e) Rate of Progression
   f) Training Specificity
   g) Arm Exercise Prescription
   h) Resistance Training

4. Electrocardiography in Heart Disease
   a) Electrodes and Leads
   b) Supraventricular Arrhythmias
   c) Ventricular Arrhythmias
   d) Atrioventricular (AV) Blocks
   e) Bundle Branch Blocks
   f) Myocardial Infarction and Ischemia
   g) ST Segment Deviations During Exercise
   h) ECG Monitoring Issues During Exercise

5. Outcome measures in cardiac rehabilitation
III. Special Considerations

1. Women
   a) Treatment of Coronary Heart Disease
   b) Evaluation of Chest Pain
   c) Cardiac Risk Factors
   d) Noninvasive stress testing
   e) Exercise Benefits
   f) Enrollment and Adherence in Exercise Programs

2. Older Patients
   a) Cardiovascular Physiologic Changes of Aging
   b) Coronary Heart Disease
   c) Risk Factor Management
   d) Exercise Training

3. Diabetes Mellitus
   a) Classification, Diagnosis, and Screening
   b) Complications
   c) Medical Management
   d) Exercise Prescription

4. Chronic Heart Failure
   a) Exercise Benefits
   b) Exercise Testing
   c) Exercise Training

5. Heart Transplantation
   a) Physiology of the Denervated Heart
   b) Exercise Responses
   c) Evidence for Reinnervation
   d) Exercise Training

UNIT III - PULMONARY REHABILITATION

1. Overview of Pulmonary Rehabilitation
   a) Definition and Scope of Pulmonary Rehabilitation
   b) The Burden of Chronic Respiratory Disease
c) A Brief History of Pulmonary Rehabilitation
d) Essential Components of Pulmonary Rehabilitation
e) Prevention
f) Patient Goals
g) Program Goals
h) Philosophy
i) Code of Ethics for the Pulmonary Rehabilitation Specialist

2. Selection and Assessment of the Pulmonary Rehabilitation Candidate
   a) Patient Selection
   b) Patient Assessment
   c) Goal Development
   d) Rehabilitation Potential

3. Outcome Measures in Pulmonary Rehabilitation
   a) Patient Education and Skills Training
   b) Education Process
   c) Focus and Scope of Educational and Skills Training

4. Exercise Assessment and Training
   a) Exercise Assessment
   b) Functional Performance Assessment
   c) Exercise Training
   d) Emergency Procedures

5. Psychosocial Assessment and Intervention
   a) Adjustment Process
   b) Psychosocial Assessment
   c) Psychosocial Interventions

6. Outcome Assessment
   a) Timing of Patient-Centered Outcome Measurement
   b) Domains for Outcome Assessment
   c) Health Domain
   d) Clinical Domain
   e) Behavioral Domain
f) Service Domain

7. Disease-Specific Approaches in Pulmonary Rehabilitation
   a) Asthma
   b) Cystic Fibrosis
   c) Interstitial Lung Disease
   d) Obesity-Related Respiratory Disorders
   e) Pulmonary Hypertension
   f) Neuromuscular and Chest Wall Disorders
   g) Lung Volume Reduction Surgery
   h) Lung Transplantation
   i) Lung Cancer and Thoraco-abdominal Surgery
   j) Mechanical Ventilation
   k) Pediatric Patients With Respiratory Disease
   l) Patients With Coexisting Respiratory and Cardiac Disease

8. Program Management
   a) The Medical Director
   b) Program Coordinator
   c) Rehabilitation Specialist
   d) Interdisciplinary Team Structure
   e) Staff Competencies
   f) Core Staff Responsibilities
   g) Continuing Education
   h) Minimum Staffing Requirements
   i) Program Components and Structure
   j) Duration of Program
   k) Policies and Procedures
   l) Facilities and Equipment
   m) Emergency Procedures

9. Pulmonary Rehabilitation Location: General Issues
   a) Documentation
   b) Conferences
c) Reimbursement
d) Strategies for Program Success
e) Post rehabilitation Maintenance Programs
f) Continuous Quality Improvement

**Recommended books**

1. Physiotherapy for Respiratory and Cardiac Problems - by Jennifer A. Pryor, S. Ammani Prasad
2. Lifestyle Management for Patients With Coronary Heart Disease; by Houston Miller
3. Training Techniques In Cardiac Rehabilitation; by Fardy, Paul
4. Coping With Heart Illness Video Pkg (NTSC); by Human Kinetics
5. Exercise Prescription for the High-Risk Cardiac Patient; by Squires, Ray
6. Physical Activity and Cardiovascular Health; by Leon, Arthur,
7. Advances in Cardiopulmonary Rehabilitation: by Jobin, Jean
8. Coronary Artery Disease; Author: Brubaker, Peter
9. Advancing the Frontiers of Cardiopulmonary Rehabilitation; by Jobin, Jean
10. Exercise and Circulation in Health and Disease; by Saltin, Bengt
11. Exercise Prescription-2nd Edition; by Swain, David P
12. Clinical Exercise Physiology; by Ehrman, Jonathan
MPTh206C: PHYSIOTHERAPY-II (PRACTICAL)

Students will be instructed via demonstrations, hands on techniques, field visits and case conferences on specific techniques used in management of patients with sports injuries. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.