

Faculty of Sports Medicine & Physiotherapy

SYLLABUS

FOR

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER: I – IV) (Credit Based Evaluation and Grading System)

Session: 2019-20



GURU NANAK DEV UNIVERSITY AMRITSAR

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MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER SYSTEM)
(Credit Based Evaluation and Grading System)

Scheme of Examination

Duration: 2 years

Eligibility: Bachelor in Physiotherapy with at least 50% marks in aggregate.

Scheme of Examination

A. Theory Examination:

Semester – I:

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
Core Courses							
CTL501	C	Basic Medical Science & Conditions	4	–	–	4	20+80=100
CTL502	C	Human Kinesiology	4	–	–	4	20+80=100
CTL503	C	Functional & Physical Assessment of Cardiothoracic Conditions	4	–	–	4	20+80=100
CTL504	C	Research Methodology & Biostatistics	4	–	–	4	20+80=100
Audit Course							
CTP511	A	Clinical Training–I	–	–	6	6	

Semester – II:

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
Core Courses							
CTL551	C	Applied Clinical Sciences	4	–	–	4	20+80=100
CTL552	C	Human Biomechanics	4	–	–	4	20+80=100
CTL553	C	Basic Physiotherapy Methods	4	–	–	4	20+80=100
CTL554	C	Medical Aspects of Cardiothoracic Conditions	4	–	–	4	20+80=100
Audit Courses							
CTP561	A	Clinical Training–II	–	–	6	6	
CTD562	A	Dissertation	–	–	8	8	

Note:-

PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory Paper) Students can opt. in any semester except Semester 1st. This ID Paper is one of the total ID Papers of this course.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER SYSTEM)
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Semester – III

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
Core Courses							
CTL601	C	Advanced Physiotherapy Methods	4	–	–	4	20+80=100
CTL602	C	Basic Cardiothoracic Physiotherapy	4	–	–	4	20+80=100
CTL603	C	Work Physiology	4	–	–	4	20+80=100
CTL604	C	Advanced Cardiothoracic Physiotherapy	4	–	–	4	20+80=100
Audit Courses							
CTP611	A	Clinical Training–III	–	–	6	6	
CTD612	A	Dissertation	–	–	8	8	
Interdisciplinary/Optional Course							
	I	Interdisciplinary/Optional Course	4	-	-	4	

Semester – IV

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
Core Courses							
CTL651	C	Physiotherapy In Cardiothoracic ICU	4	–	–	4	20+80=100
CTL652	C	Cardiothoracic Rehabilitation	4	–	–	4	20+80=100
CTL653	C	Management And Professional Ethics	4	–	–	4	20+80=100
CTL654	C	Recent Trends In Physiotherapy	4	–	–	4	20+80=100
Audit Courses							
CTP661	A	Clinical Training–IV	–	–	6	6	
CTD662	A	Dissertation	–	–	8	8	

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER SYSTEM)
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B. Practical Examination–24 Credits

Practical examination of 24 credits will be conducted at the end of 4th semester which includes patient evaluation and management, viva–voce etc.

C. Dissertation – 24 Credits

The topic of dissertation will be allocated in Second Semester and candidate will work for 2 semesters and submit a written thesis in 4th semester. The student will be awarded grade for the total number of credits earned in dissertation in II, III and IV semesters of study at the end of the IV semester.

Practical Attachments:

To enable the students to acquire practicing in hand on skills, maximum emphasis will be laid on regular practical classes, demonstration and clinical practice. The students will undergo Clinical / Government Medical College Amritsar, and decided by BOC.

* The credits earned by a candidate in practical and dissertation during different semesters will be evaluated at the end of the 4th semester and the grade will be determined accordingly.

* A candidate shall be required to maintain minimum of 5.00 SGPA at the end of each semester. A student getting ‘C’ or lower grade in any course in this discipline will be treated as having failed in that course and shall have to repeat the core/elective courses/or repeat/opt. another course in lieu of interdisciplinary/outside department course with approval of Board of Control, and will have to obtain at least ‘B’ grade in that course within specified period as per the prevailing rules. The weights of ‘C’ and lower Grades will not be counted in SGPA or CGPA.

** Interdisciplinary/Optional Course: to be offered from outside the department.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
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CTL501: BASIC MEDICAL SCIENCE & CONDITIONS

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Applied Anatomy: A Review

1. A review of organization and regulation of motor system.
 - a) Types of movement and factors affecting contact and range of motion at synovial joints
 - b) Skeletal muscle fibers: composition, structure and characteristics
 - c) Muscle metabolism
 - d) Contraction and relaxation of muscle
 - e) Control of muscle tension

2. Anatomy of certain diseases
 - a. Common dislocations
 - b. Low back pain
 - c. Sciatica
 - d. Lesions of inter-vertebral disc
 - e. Anatomical and Physiological loss resulting from nerve injury.
 - f. Peripheral nerve entrapment(such as carpal tunnel syndrome, cubital tunnel syndrome, tarsal tunnel syndrome, morton neuroma)
 - g. Spinal infection

Section-B

Applied Physiology

1. **Blood**
 - a. The various components of blood
 - b. Viscosity correlation
 - c. Oxyhemoglobin Dissociation curves
 - d. Interrelationship between pressure flow and resistance

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
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2. Cardiovascular system

- a) Cardiac cycle
- b) Cardiac output and its regulation
- c) Cardiac output in normal stress conditions
- d) Methods of measuring cardiac output
- e) Oxygen demand theory of local blood flow circulation
- f) Mechanisms of arterial pulse regulation
- g) Hypertension
- h) Normal coronary blood flow along with variations
- i) The cardiac reserve
- j) Physiological causes of shock

Section-C

1. Respiratory system:

- a. Review of mechanics of respiration
- b. Pulmonary volumes and capacities
- c. Transport of oxygen in blood
- d. Carbon dioxide in blood
- e. Regulation of respiration
- f. Respiratory abnormalities Hypoxia, Hypercapnoea, Hypocapnoea
- g. Artificial respiration
- h. Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea
- i. Respiratory changes during exercise.

Section-D

1. Endocrine system:

Physiology of the endocrine glands – Pituitary, Pineal Body, Thyroid, Parathyroid, Adrenal, Thymus, Pancreas, Testes & Ovary. Hormones secreted by these glands, their classifications and functions.

References:

1. Synopsis of Surgical Anatomy – John Wright & Sons, Bristol 1970 ed.
2. Gray's Anatomy - Williams & Warwick - Churchill Livingstone. 35th ed. 2007
3. Clinical Anatomy for Medical Students - Snell – Lippincott. 6th ed., 2000
4. Textbook of Medical Physiology - Guyton - Mosby. 10th Ed 2000
5. Pathologic Basis of Diseases - Robbins, Kotran and Kumar – W.B. Saunders. 7th ed, 2004
6. Pathology implications for Physical Therapists - Goodmann & Boissonnault- W. B. Saunders. 1999
7. Tureks – Orthopedics - Weinsteil & Buckwalter - Lippincott Publications.2004

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
(Credit Based Evaluation and Grading System)

CTL502: HUMAN KINESIOLOGY

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Definition, aims, objectives and role of Kinesiology in physiotherapy.
2. Review of fundamental concepts (applied aspect), Centre of gravity, Line of gravity, Planes, Lever system in Body, Fundamental starting positions.

Section-B

1. Frame work and joints of the body: Classification of the muscles and their structure, functions and role.
2. Types of Muscle contractions (Static, Concentric and Eccentric), Two joint Muscles, Angle of pull, Role of Gravity affecting muscular action.

Section-C

1. Physical Properties of bone, cartilage and muscle and their functional adaptation in various conditions.
2. Joints: Definition and Classification of joints- Shoulder, Elbow, wrist joint, Hip, Knee, Ankle, Inter-vertebral joints, small joints of hand and foot.
3. Origin, insertion, nerve supply and action of all important muscles related to human movement.

Section-D

1. Motion, type of motion, Distance and speed, Displacement and velocity, Acceleration, Angular distance and Angular displacement, Angular Speed, Angular Velocity, Angular Acceleration, Inertia, mass, weight, Newton's Laws of motion, Sections in linear and angular motion.
2. Force and its characteristics, internal and external forces, Classification of force system, Composition and resolution of forces. Friction, impact, elasticity, principles of spin and rebound, Eccentric forces, Moment, Principles of Lever, Rotatory force, Gravity, Methods of finding centre of gravity, Principles of Equilibrium, principles of projectile.

References

1. Brunnstrom - Clinical Kinesiology, F.A. Davis. 4th Ed, 2003
2. Rasch and Burk: Mishra: Clinical Neurophysiology, B.I. Churchill Livingstone. 3rd Ed.
3. Kinesiology and Applied Anatomy, Lee and Fabiger. 2002
4. White and Punjabi - Biomechanics of Spine - Lippincott. 2nd Ed, 1995.
5. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders, 2007.
6. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis, 2001

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
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**CTL503: FUNCTIONAL & PHYSICAL ASSESSMENT OF CARDIOTHORACIC
CONDITIONS**

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Brief Anatomy of Cardiothoracic region:

1. Anatomy of Heart: Pericardium and structure of the heart wall, Chambers of heart, Valves of heart, Blood supply to myocardium, surface markings of heart, structure of cardiac muscle fibres.
2. Anatomy of Lungs: Pleura, Fissures of lungs, Bronchopulmonary segments, surface markings of lungs, muscles of respiration (primary and accessory).

Section-B

Brief Physiology of Cardiovascular and Respiratory system

1. Pressure changes during cardiac cycle
2. Properties of cardiac muscle and its function
3. Nervous control of blood circulation
4. Humoral control of blood circulation
5. Physiological basis of ischemic heart disease
6. Frank-Starling's law
7. Structure and function of Respiratory system
8. Control of respiration

Section-C

Assessment of Cardiovascular system

1. Heart sounds
2. Arterial Pulses
3. The Venous Pulse
4. Clubbing
5. Cyanosis
6. Rate and Rhythm

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
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Assesment of Respiratory system

1. Subjective Assessment
2. Inspection
3. Palpation
4. Percussion
5. Auscultation

Section-D

1. Electrocardiography: Recording and evaluating ECG strip,
2. Imaging Techniques: Chest radiography, Computed Tomography.
3. Pulmonary Function Testing - Test of lung volumes and capacities, test of gas diffusion.
4. Arterial Blood Gas Analysis
5. Bronchoscopy

References

1. Jennifer A. Pryor, S Ammani Prasad, Physiotherapy for Respiratory and Cardiac Problems, Elsevier Health Sciences, 2002.
2. Goldberger, Clinical Electrocardiography- A simplified approach, Elsevier Health Sciences, 2006.
3. Steven A. Conrad, Gary T. Kinasewitz, Pulmonary Function Testing: Principles and Practice, Churchill Livingstone, 1984.
4. Dale Davis, Differential Diagnosis of Arrhythmias, W.B. Saunders

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – I)
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CTL504: RESEARCH METHODOLOGY & BIOSTATISTICS

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Research Methodology:

1. Introduction
 - a. Importance of research in clinical practice
 - b. Scientific approach
 - c. Characteristics
 - d. Purposes and limitations.
2. Ethical issues in research.
3. Structure, formulation and implementation of a research project
4. Research questions
 - a. Selection and statement of problem
 - b. Literature review
 - c. Meta-analysis.

Section-B

1. Types of research
 - a. Basic and Applied
 - b. Qualitative & Quantitative
 - c. Descriptive & Experimental
 - d. Longitudinal & Cross-sectional
2. Experimental Research
 - a. Types of Sampling
 - b. Variables
 - c. Experimental design
 - d. Factorial design

Section-C

1. Survey research:
 - a. Conducting a survey
 - b. Questionnaires
 - c. Steps in conducting survey research
 - d. Epidemiological research

Section-D

1. Biostatistics

- a. Mean, Mode, Median
- b. Standard deviation
- c. Correlation and regression
- d. ANOVA and its application
- e. Validity and reliability
- f. Parametric (Student ‘t’ test, Paired ‘t’ test, Probability)
- g. Non-parametric statistics (Chi square test, Wilcoxon’s signed rank test)
- h. Sample size determination

References

1. Mohsin S.M.: Research Methods in Behavioral Sciences: Orient Publications. 2nd Ed.
2. Colton: Statistics in medicine, Little Brown Company, Boston. 3rd Ed.
3. Mahajan: Methods in Biostatistics, Jay Pee Brothers. 3rd Ed., 2002
4. Vincent: Statistics in Kinesiology, Human Kinetics. 3rd Ed., 2005
5. Hicks: Research for Physiotherapists, Churchill Livingstone. 2nd Ed., 1995

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – II)
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CTL551: APPLIED CLINICAL SCIENCES

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Cell injuries:- Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure, Reversible cell injury, Irreversible cell injury, Pathologic calcification.
2. Inflammation

Section-B

1. Repair, wound healing by primary and secondary union, factors promoting and delaying the process. healing in specific site including bone healing. "Failed" healing responses.
2. Repair of soft tissue injuries.
3. Principles of drug action.
4. Basic pharmacokinetics and Pharmacodynamics.

Section-C

1. The use of drugs in various musculoskeletal disorders.
2. The use of drugs in various cardiovascular disorders.
3. The use of drugs in various neurological disorders.
4. The use of drugs in various Respiratory disorders.

Section-D

1. Basics of radiology including ultrasonography, X-ray, CT & MRI scanning
2. Imaging of the head and neck.
3. Imaging of spine.
4. Imaging of thorax and abdomen.
5. Imaging of upper extremity.
6. Imaging of lower extremity.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – II)
(Credit Based Evaluation and Grading System)

References:

1. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan. 11th Ed.
2. Pharmacology and Pharmacotherapeutics - Satoskar & Bhandarkar - Popular Publications - Bombay. 17th Ed.
3. Davidsons – Principles and Practice of Medicine- Edward - Churchill Livingstone. 8th Ed.
4. Systems of Orthopedics - Apleys - Butterworth Heinmann. 13th Ed.
5. Outline of Orthopedics - Adams - Churchill Livingstone. 11th Ed.
6. Outline of Fractures - Adams - Churchill Livingstone. 11th Ed.
7. Tureks – Orthopedics - Weinsteil & Buckwalter - Lippincott Publications, 2004.
8. Text Book of Radiology - Sutton D. - Churchill Livingstone. 7th Ed.,2002.

CTL552: HUMAN BIOMECHANICS

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Introduction to Human Biomechanics

1. Mechanics - Definition of mechanics and Biomechanics
2. Principle of Biomechanics
3. Nature and importance of Biomechanics in Physiotherapy
4. Elasticity - Definition, stress, strain, HOOKE'S Law

Section-B

Biomechanics of upper and lower extremities

1. Biomechanics of shoulder motion
2. Biomechanics of elbow motion
3. Biomechanics of wrist and hand motion
4. Biomechanics of pelvic motion
5. Biomechanics of hip motion
6. Biomechanics of knee motion
7. Biomechanics of ankle & foot motion

Section-C

Biomechanics of spinal region

1. Biomechanics of cervical region
2. Biomechanics of thoracic region
3. Biomechanics of lumbosacral region
4. Biomechanics of sacroiliac joint

Section-D

Posture & Gait

1. Posture – dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.
2. Gait – kinematics and kinetics of gait, Biomechanics of running and stair climbing.

References:

1. Brunnstrom - Clinical Kinesiology, F.A. Davis. 5th Ed.
2. White and Punjabi - Biomechanics of Spine - Lippincott. 2nd Ed, 1995.
3. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis, 2001.
4. Nordin & Frankel - Basic Biomechanics of Muscular Skeletal System - Williams & Wilkins, 2nd Ed. 2001.
5. Koley – Textbook of Biomechanics, AITBS Publishers, India, 2019.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – II)
(Credit Based Evaluation and Grading System)

CTL553: BASIC PHYSIOTHERAPY METHODS

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Define Rehabilitation, Goals and Objectives of Rehabilitation, multidisciplinary approach of rehabilitation.
2. Modern concepts in rehabilitation.
3. Definition, details of effects and uses of therapeutic exercises.
 - a. Dynamic Exercises
 - b. Isokinetic Exercises
 - c. Isometric and Isotonic Exercises
 - d. Kinetic chain exercises

Section-B

1. Stretching
2. Balance and coordination exercises
3. Factors affecting the joint range of motion prevention of stiffness, methods of joint mobilization.
4. Causes of muscle weakness, Prevention of disuse atrophy, Principles of treatment to increase muscle strength and function.
 - a. Techniques of strengthening with respect to regional consideration.
 - b. Various methods of progressive resisted exercise.

Section-C

1. Principles and application of neuromuscular facilitation techniques including PNF
2. Principles of different soft tissue mobilizations (such as Myofascial Techniques)
3. Neural Tissue Mobilization
4. Methods for improving neuromuscular control, proprioception and Kinesthetic sensation following different injuries.

Section-D

1. Muscle Energy Technique
2. Concept of group therapy.
3. Physiotherapy – Ethics & Medico legal aspects.

References:

1. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi, 3rd Ed.
2. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A. Davis, 5th Ed.
3. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins, 2004.
4. Thomson et al - Tidy's Physiotherapy: Butterworth – Heinmann, 13th Ed.
5. Kendall: Muscles – Testing and Function - Williams & Wilkins, 4th Ed.
6. William E. Prentice: Rehabilitation Techniques – Mosby, 4th Ed, 2003.
7. Norkin & White: Measurement of Joint Motion – A Guide to Goniometry - F.A. Davis, 2002.
8. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications, W.B. Saunders, 2004.
9. Voss et al - Proprioceptive Neuromuscular Facilitation - Patterns & Techniques - Williams & Wilkins, 2nd Ed, 2004.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – II)
(Credit Based Evaluation and Grading System)

CTL554: MEDICAL ASPECTS OF CARDIOTHORACIC CONDITIONS

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Cardiovascular diseases

1. Hypertension: Causes and Pathophysiology
2. Heart failure, Its cause and Management
3. Ischemic Heart disease
4. Coronary Artery disease
5. Myocardial infarction
6. Rheumatic Heart disease

Section-B

Respiratory disease

1. Chronic obstructive Pulmonary diseases (COPD)
2. Bronchial Asthma
3. Pulmonary Tuberculosis
4. Respiratory failure

Section-C

Congenital Cardiothoracic conditions

1. Patent ductus arteriosus
2. Coarctation of aorta
3. Atrial septal defect
4. Ventricular septal defect
5. Tetralogy of Fallot
6. Pulmonary stenosis
7. Chest wall deformities

Section-D

Acquired Cardiovascular conditions

1. Mitral valves stenosis
2. Mitral valves regurgitation
3. Aortic stenosis
4. Aortic regurgitation
5. Lung cancers
6. Raynaud's Disease
7. Buerger's Disease

References:

1. Crofton and Douglas's Respiratory Diseases Anthony Seaton Douglas Seaton 5th edition Blackwell Science.
2. Davidson's Principles and Practice of Medicine Christopher Haslet 19th edition Churchill Livingstone.
3. Braunwald's Heart Disease Zipes,Libby 7th edition Saunders
4. Jennifer A. Pryor, S Ammani Prasad, Physiotherapy for Respiratory and Cardiac Problems, Elsevier Health Sciences, 2002.
5. Dale Davis, Differential Diagnosis of Arrhythmias, W.B. Saunders.

CTL601: ADVANCED PHYSIOTHERAPY METHODS

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage
End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Introduction to manual therapy
 - a. Joint techniques
 - b. Manual joint therapy
 - c. Traction Principles
 - d. Basic principles of manipulation for various disorders of the spine and extremities.

Section- B

1. Biophysics, Physiological effects, indications, contraindications and specific uses in Physiotherapy of the following equipments:- such as Infrared rays, Paraffin Wax Bath, Moist Heat Pack, Fluidotherapy, LASER, UVR.
2. **Massage:** - Definition and classification of massage techniques, Physiological effects of massage, Connective tissue massage, therapeutic applications and contraindications of massage.

Section- C

1. **Hydrotherapy-** Physiological Effects, raising temperature baths, baths with additives, whirl pool bath. Rehabilitation approach using hydrotherapy.
2. **Cryotherapy-** Physiological effects, Use of cold therapy in acute phase, rehabilitative phase, preventive phase of injury, Methods of application, Indications and contraindications.

Section- D

Electrotherapy approach-

1. Principles underlying the application of following modalities with reference to their production, biophysical and therapeutic effects, indications and contraindications and the specific uses in Physiotherapy.
 - a. Low Frequency Current: Direct Current Modified Direct Current, Alternative Current, Diadynamic Current, Iontophoresis, TENS, High Voltage, Pulsed Galvanic Stimulation.
 - b. Medium Frequency Current: IFT, Russian Currents.
 - c. High Frequency Currents: SWD, MWD, Ultrasound.

Practical:

1. The students will undergo clinical training in the Health Centre on various apparatus of physiotherapy. This training will constitute major part of the practical examination.

References:

1. A.G. Sinha, Principle and Practices of Therapeutic Massage. Jaypee Brothers, New Delhi, 2001.
2. William E. Prentice: Rehabilitation Techniques – Mosby, 4th Ed.
3. O' Sullivan, Schmitz: Physical Rehabilitation – Assessment and Treatment - F.A. Davis, 4th Ed, 2006.
4. John Low & Reed: Electrotherapy Explained, Butterworth, 4th Ed, 2006.
5. Meryl Roth Gersh: Electrotherapy in Rehabilitation, FA Davis, 3rd Ed.
6. Joseph Kahn: Principles and Practice of Electrotherapy, Churchill Livingstone, 3rd Ed.
7. Claytons Electrotherapy - Sarah & Bazin - W.B. Saunders, 12th Ed.
8. Nelson and Currier: Clinical Electrotherapy, Prentice Hall, 3rd Ed.
9. Greenman: Principles of Manual medicine, William and Wilkins, 3rd Ed.
10. Michlovitz - Thermal agents in Rehabilitation - F.A. Davis, 1996.
11. Lehmann - Therapeutic Heat and Cold - Williams & Wilkins, 4th Ed, 1990.

CTL602: BASIC CARDIOTHORACIC PHYSIOTHERAPY

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Therapeutic Body Positioning: Indications and physiological effects of different body positions, Positioning in neonates/infants.
2. Mobilization and Therapeutic Exercises: Physiological consequences of immobilization, Acute and long-term responses to mobilization and exercises, Exercise testing and training prescription Primary Cardiopulmonary dysfunction, Exercise testing and training prescription Secondary Cardiopulmonary dysfunction Clinical decision making in cardiopulmonary therapeutics

Section- B

1. Breathing Exercises, Controlled Diaphragmatic breathing, Facilitation of ventilatory pattern and Breathing strategies, Chest wall mobilization, Ventilatory or respiratory muscle training. Repatterning techniques.
2. Glossopharyngeal Breathing, Pursed lip breathing, relaxed breathing, segmental breathing, indications for each technique.

Section- C

1. Bronchopulmonary hygiene techniques: Percussion, Vibration, Shaking, Quick Stretch coughing, huffing, Postural drainage. Indications, contraindications and precautions of each technique.

Section- D

1. Autogenic drainage, active cycle of breathing techniques.
2. Physiological basis for Airway Clearance Techniques, Clinical application of airway clearance techniques and Facilitating airway clearance with coughing techniques

References

1. Jennifer A. Pryor, S Ammani Prasad, Physiotherapy for Respiratory and Cardiac Problems, Elsevier Health Sciences, 2002.
2. Goldberger, Clinical Electrocardiography- A simplified approach, Elsevier Health Sciences, 2006.
3. Steven A. Conrad, Gary T. Kinasewitz, Pulmonary Function Testing: Principles and Practice, Churchill Livingstone, 1984.
4. Dale Davis, Differential Diagnosis of Arrhythmias, W.B. Saunders

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – III)
(Credit Based Evaluation and Grading System)

CTL603: WORK PHYSIOLOGY

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. **Nutrition**
 - a. Carbohydrates, Fats, Proteins.
 - b. Vitamins, Minerals and Water.
 - c. Optimal Nutrition for Physical activity.
2. **Energy Transfer in Physical activity:**
 - a. Energy transfer in Body.
 - b. Energy transfer in exercise.
 - c. Energy expenditure during various activities.
 - d. Fatigue.

Section- B

1. **Cardiovascular adaptation to exercise:**
 - a. Cardiovascular adaptations to sustained aerobic exercises.
 - b. Coronary heart disease, exercise and optimization of lipid profile.
 - c. Regulation of circulation during exercise.
 - d. Circulatory responses to various types of exercise regulation of cardiovascular system during exercise.

Section- C

1. **Respiratory responses to exercise:**
 - a. Regulation of Respiration during exercise.
 - b. Ventilation at Rest and during Exercise.
 - c. Ventilation and the Anaerobic Threshold.
 - d. Static and dynamic lung volume.
 - e. Adaptive changes in the respiratory systems due to regular physical activities .

Section- D

1. **Musculoskeletal responses to exercises:**
 - a. Growth and Exercise.
 - b. Training for Muscular Strength and Endurance.
2. **Endocrine system responses to exercise:**
 - a. Effects of exercise on various Hormones in the body.
 - b. Hormone regulation of fluid and electrolytes during exercise.
 - c. Exercise and Menstrual Cycle.

References

1. Mc Ardle, Katch, Katch: Exercise Physiology, 5th Ed.
2. George A. Brooks, Thomas D. Fahey: Exercise Physiology – Human Bioenergetics and its applications 1984, John Wiley & Sons, New York, 4th Ed.
3. Astrand & Rodahl: Text Book of Work Physiology, McGraw Hill, 2003.
4. Fox and Mathews - The Physiological Basis of Physical Education and athletics - Holt Saunders, 4th Ed.
5. Koley – Essentials of Exercise Physiology, Jaypee Brothers, New Delhi, 2018.
6. Levick, J.R. (1998) An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – III)
(Credit Based Evaluation and Grading System)

CTL604: ADVANCED CARDIOTHORACIC PHYSIOTHERAPY

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Obstructive lung diseases ,Restrictive lung diseases, Suppurative lung diseases, Infective lung diseases , Respiratory tract infections , Occupational and interstitial lung diseases
2. Chest trauma ,Chest wall deformities & Neuromuscular disorders ,Lung cancers

Section- B

1. Shock management
2. Stretcher use-Handling and transfer
3. Shoulder and thoracic mobility exercise.
4. Management of Children with respiratory dysfunction
5. Management of Diaphragmatic diseases & Abnormalities, Sleep apnoea, Hyperventilation syndrome, Diseases of the Pleura, Adult Respiratory Distress syndrome, Drug induced lung disease, Oxygen toxicity and related syndromes.

Section- C

1. Thoracoscopy
2. Video Assisted Thoracoscopy
3. Lobectomy, Pneumonectomy, Thoracotomy
4. Pleurodesis, Pleurectomy, Bullectomy, Segmental Resection.

Section- D

1. CABG
2. Angioplasty
3. Repair of congenital defects, valvoplasties, pericardiectomy, aneurysectomy, etc.
4. Cardiac transplant

References

1. Jennifer A. Pryor, S Ammani Prasad, *Physiotherapy for Respiratory and Cardiac Problems*, Elsevier Health Sciences, 2002.
2. Goldberger, *Clinical Electrocardiography- A simplified approach*, Elsevier Health Sciences, 2006.
3. Steven A. Conrad, Gary T. Kinasewitz, *Pulmonary Function Testing: Principles and Practice*, Churchill Livingstone, 1984.
4. Dale Davis, *Differential Diagnosis of Arrhythmias*, W.B. Saunders
5. *Crofton and Douglas's Respiratory Diseases* Anthony Seaton Douglas Seaton 5th edition Blackwell Science.
6. *Davidson's Principles and Practice of Medicine* Christopher Haslet 19th edition Churchill Livingstone.
7. *Braunwald's Heart Disease* Zipes,Libby 7th edition Saunders.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – IV)
(Credit Based Evaluation and Grading System)

CTL651: PHYSIOTHERAPY IN CARDIOTHORACIC ICU

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Monitoring Systems in I.C.U invasive and non-invasive cardio-respiratory equipments for monitoring vital signs, Pulse oximetry, Transcutaneous PO₂ and PCO₂, Capnometry.
2. Intensive care unit management of individuals with Primary cardiopulmonary dysfunction (principles, mobilization, positioning, secretion clearance, specific maneuvers).
3. ICU management of secondary cardiopulmonary dysfunction (obesity, musculoskeletal trauma, head injuries, spinal injuries, burns etc.).

Section- B

1. Care of unconscious patient.
2. Special precautions during physiotherapy treatment of various conditions in ICU.
3. Physiotherapy management in pediatric and neonatal ICU.
4. Complications, Adult Respiratory distress syndrome, acute asthma, shock, sepsis, and multiorgan system failure.
5. ICU management and Essentials for ICU Patient: Patient safety concerns and infection Control.
6. Basic and Advanced airway tubes, Monitoring of chest tube drainage and underwater seal system.

Section- C

1. Emergency management of airways: Manual Resuscitators, Suction equipments and suction catheters, Types of oropharyngeal airways, Endotracheal intubation, Care of the patient with an Artificial Airway. Extubation and post extubation care.
2. Respiratory Therapy Procedures: Gas delivery system i.e. Regulators, Flow meters, Oxygen therapy - its clinical indications, hazards and complications, various oxygen delivery devices (invasive and non-invasive). Symptoms of hypoxia and carbon dioxide narcosis.
3. Mechanical Ventilation, indications and contraindications, complications, overview of modes, CPAP and Bi-PAP, Positive End Expiratory Pressure and its significance and detrimental effects. Weaning of patient from ventilator. Care of patient with mechanical ventilation.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – IV)
(Credit Based Evaluation and Grading System)

Section- D

1. Humidifiers – Principles of operation and clinical indications for humidity therapy, Devices used for humidification, Aerosol drug therapy.
2. Advanced Cardiac care: Cardiac Pacemaker – its indications, safety measures and care and Cardioverter Defibrillators.
3. Basic Life Support and Advanced Cardiac Life Support: Defibrillator (Types, Waveforms and How to give DC shock).

References

1. Braunwald's Heart Disease Zipes, Libby 7th edition Saunders.
2. Jennifer A. Pryor, S Ammani Prasad, Physiotherapy for Respiratory and Cardiac Problems, Elsevier Health Sciences, 2002.
3. Goldberger, Clinical Electrocardiography- A simplified approach, Elsevier Health Sciences, 2006.
4. Steven A. Conrad, Gary T. Kinasewitz, Pulmonary Function Testing: Principles and Practice, Churchill Livingstone, 1984.
5. Dale Davis, Differential Diagnosis of Arrhythmias, W.B. Saunders
6. Crofton and Douglas's Respiratory Diseases Anthony Seaton Douglas Seaton 5th edition Blackwell Science.
7. Davidson's Principles and Practice of Medicine Christopher Haslet 19th edition Churchill Livingstone.

CTL652: CARDIOTHORACIC REHABILITATION

L T P
4 0 0

Max. Marks: 100
Internal: 20
External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Cardiac Rehabilitation: Historical Background, objectives and definition of cardiac rehabilitation, Patients selection and risk stratification.
2. Phases of Cardiac Rehabilitation
3. An overview of Inpatient program and emphasizing outpatient program along with its structure and content, Rehabilitation of special patient population (angina or silent ischemia and chronic heart failure etc).

Section- B

1. Education and Psychological aspects of Cardiac Rehabilitation, Dietary aspects of Cardiac Rehabilitation, Outcomes of cardiac rehabilitation.
2. Transplant Patient Rehabilitation Advanced techniques in cardiac rehabilitation and Rehabilitation for Pediatric and Geriatric age groups.

Section- C

1. Pulmonary Rehabilitation: Principal goals and rationale of pulmonary rehabilitation, Patients' selection and assessment.
2. Measurement of respiratory and peripheral muscle strength
3. Assessment of performance of ADL and health status.

Section- D

1. Education and Life style management in Pulmonary Rehabilitation.
2. Nutritional and psychological aspects and recent advances in Pulmonary Rehabilitation.
3. Pulmonary Rehabilitation in specific disorders.

References

1. Jennifer A. Pryor, S Ammani Prasad, *Physiotherapy for Respiratory and Cardiac Problems*, Elsevier Health Sciences, 2002.
2. Goldberger, *Clinical Electrocardiography- A simplified approach*, Elsevier Health Sciences, 2006.
3. Steven A. Conrad, Gary T. Kinasewitz, *Pulmonary Function Testing: Principles and Practice*, Churchill Livingstone, 1984.
4. Dale Davis, *Differential Diagnosis of Arrhythmias*, W.B. Saunders
5. *Crofton and Douglas's Respiratory Diseases* Anthony Seaton Douglas Seaton 5th edition Blackwell Science.
6. *Davidson's Principles and Practice of Medicine* Christopher Haslet 19th edition Churchill Livingstone.
7. *Braunwald's Heart Disease* Zipes, Libby 7th edition Saunders.

CTL653: MANAGEMENT AND PROFESSIONAL ETHICS

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Function of management
2. Evaluation of management through scientific management theory, Classical theory, System approach, Contingency approach.
3. Management process, Planning, Organization, direction, controlling decision making.
4. Introduction of personnel management, Staffing recruitment selection, performance appraisal, discipline, job satisfaction.
5. Quantitative methods of management, Relevance of statistical and / or techniques in management
6. Total quality management

Section- B

1. Hospital as an organization
2. Function and types of hospitals selected, clinical supportive ancillary services of Hospital, emergency department, nursing, physical medicine & rehabilitation.
3. Roles of Physiotherapist, Physiotherapy director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aids.

Section- C

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

Section- D

1. A wider knowledge of ethics related to current social and medical policy in the provisions of health care.
2. Function of the relevant professional association education body and trade union.
3. The role of the international health agencies such as the world health organization.
4. Standard of practice for physical therapies.

References

1. public power and administration – Wilenski, Hale and Iremonger,
1986
2. physical therapy administration and management – Hickik Robert J
3. Management principles for Physiotherapists – Nosse Lorry J.
4. Industrial Therapy – Key G L, Mosby, St. Louis 1987

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – IV)
(Credit Based Evaluation and Grading System)

CTL654: RECENT TRENDS IN PHYSIOTHERAPY

L T P
4 0 0

Max. Marks: 100

Internal: 20

External: 80

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section- A

1. Manual Therapy: Introduction, Classification, Assessment for mobilization and manipulation. The concepts of mobilization, such as:
 - a. Maitland
 - b. Cyriax,
 - c. Kaltenborn
 - d. Mennel
 - e. Mulligan
 - f. McKenzie

Section- B

1. Pain: Assessment & management
2. Butler mobilization of nerves
3. Review of Special tests for various joints

Section- C

1. Myofascial Release: Concept & brief discussion of its application technique
2. Muscle Energy Techniques
3. Positional release technique
4. Principles of Taping and application- Rigid & Dynamic Taping

Section- D

1. Segmental Stabilization Concepts of Spine:
 - b. Muscle function in spinal stabilization
 - c. Contribution of various muscles to spinal stabilization
 - d. Local Muscle dysfunction in Low back pain
 - e. Principles of clinical management of deep muscle system for segmental Stabilization.

MASTERS IN PHYSIOTHERAPY (CARDIOTHORACIC) (SEMESTER – IV)
(Credit Based Evaluation and Grading System)

References:

1. Clinical Orthopedic Rehabilitation, Brent Brotzman.
2. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
3. Physical Rehabilitation Assessment and Treatment, Susan O Sullivan, Jaypee brothers
4. Therapeutic Exercise for Spinal Segmental Stabilization in Low back Pain, C. Richardson, G. Jull, Churchill Livingstone.
5. William E. Prentice: Rehabilitation Techniques – Mosby.