Khalsa College Amritsar

-An Autonomous College

Affiliated to Guru Nanak Dev University, Amritsar.

Session 2022-2023
Syllabus: Physiotherapy

Post-Graduate Department of Physiotherapy

SYLLABUS

FOR

MPT
(Master of Physiotherapy)

Programme Code: MPT

(Two years/Four semesters)

2022-2023

INDEX (MASTER OF PHYSIOTHERAPY)

Programme Name: Master of Physiotherapy (MPT)

PROGRAMME SPECIFIC OUTCOMES (PSO)

MPT (Cardiopulmonary, Orthopedics and Neurology)

The aim of the course is to provide a comprehensive, training to the students that prepare them for providing a quality physiotherapy care to the patients so that at the end of the course he/she will be able to perform the following:

PSO-1	Interpretation of different invasive and non invasive diagnostic investigation to make proper assessment in various respiratory, cardiovascular, musculoskeletal and neurological dysfunctions.
PSO-2	Develops the skills to execute different Physiotherapy techniques used in treatment of Cardiopulmonary, musculoskeletal and neurological dysfunctions dysfunctions.
PSO-3	Demonstrate abilities to select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.
PSO-4	Able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve cardiopulmonary, musculoskeletal and neurological functions.
PSO-5	Able to design & execute effective tailored cardiopulmonary, musculoskeletal and neurological rehabilitation programme.
PSO-6	Able to execute the principle of care of patients at the Intensive care area.
PSO-7	Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensurethat patients receive the highest level of professional care.
PSO-8	Establish the foundations for lifelong learning and continuing professional development through attendance in various seminars, CMEs and conferences.
PSO-9	Manage time and prioritize tasks, and work autonomously when necessary and appropriate, demonstrate clinical decision making ability andprovide appropriate patient care.
PSO-10	Function effectively as a mentor and teacher contributing to the appraisal, assessment and review ofcolleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.
PSO-11	Analyze the roles and expertise of health care professionals and social workers in the context of working and functioning as a multidisciplinary team forthe delivery of safe and high-quality care.
PSO-12	Critically appraise the results of relevant qualitative and quantitative studies as reported in scientific literature and outline the ethical issues involved in clinical research.
PSO-13	Write accurate, legible and complete clinical records, use computers and other information systems for data storage, retrieval, prepare health promotion material for patients, research and education.

Scheme of Examination

MPT (Cardiopulmonary)

Semester-I

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1101	Research Methodology & Biostatistics	25	--	75	--	100	42	--
MPC-1101	Basic Medical Sciences	25	25	75	75	200	56	56
MPC-1102	Physical and Functional Evaluation in Cardiopulmonary Disorders	25	25	75	75	200	56	56
MPC-1103	Clinicals/Journal Club - I	--	25	--	75	100	--	300

Semester-II

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1202	Skill Enhancing Studies	25	--	75	--	100	42	--
MPT-1203	Exercise Physiology and Nutrition	25	25	75	75	200	56	56
MPC-1204	Medical and Surgical Aspects of Cardiopulmonary Conditions	25	25	75	75	200	56	56
MPC-1205	Clinicals/Journal Club - II	--	25	--	75	100	--	300

Semester-III

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPC-2306	Cardiopulmonary Physiotherapy	25	25	75	75	200	56	56
MPC-2307	Preventive Cardiology	25	25	75	75	200	56	56
MPC-2308	Dissertation – I	--	25	--	75	100	--	56
MPC-2309	Practical	--	25	--	75	100	--	56
MPC-2310	Clinicals/Journal Club – III	--	25	--	75	100	--	300

Semester-IV

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPC-2411	Cardiac and Pulmonary Rehabilitation	25	25	75	75	200	56	56
MPC-2412	Modalities and Interventions in ICU	25	25	75	75	200	56	56
MPC-2413	Dissertation – II	--	50	--	150	200	--	126
MPC-2414	Practical	--	50	--	150	200	--	126
MPC-2415	Clinicals/Journal Club - IV	--	25	--	75	100	--	300

Total Hours (Theory) = 532
Total Hours (Practical) = 2012
Total Hours = 2544

MPT (Orthopedics)

Semester-I

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1101	Research Methodology & Biostatistics	25	--	75	--	100	42	--
MPO-1101	Basic Medical Sciences	25	25	75	75	200	56	56
MPO-1102	Physical and Functional Evaluation in Musculoskeletal Disorders	25	25	75	75	200	56	56
MPO-1103	Clinicals/Journal Club - I	--	25	--	75	100	--	300

Semester-II

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1202	Skill Enhancing Studies	25	--	75	--	100	42	--
MPT-1203	Exercise Physiology and Nutrition	25	25	75	75	200	56	56
MPO-1204	Medical and surgical aspects of Orthopedic conditions	25	25	75	75	200	56	56
MPO-1205	Clinicals/Journal Club – II	--	25	--	75	100	--	300

Semester-III

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPO-2306	Physiotherapy management in Orthopedic conditions	25	25	75	75	200	56	56
MPO-2307	General Orthopaedic Physiotherapy	25	25	75	75	200	56	56
MPO-2308	Dissertation – I	--	25	--	75	100	--	56
MPO-2309	Practical	--	25	--	75	100	--	56
MPO-2310	Clinicals/Journal Club–III	--	25	--	75	100	--	300

Semester-IV

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total	Teaching Hours	
		Th	Pr				Th	Pr
MPO-2411	Bioengineering and rehabilitation principles	25	25	75	75	200	56	56
MPO-2412	Approaches in Musculoskeletal physiotherapy	25	25	75	75	200	56	56
MPO-2413	Dissertation – II	--	50	--	150	200	--	126
MPO-2414	Practical	--	50	--	150	200	--	126
MPO-2415	Clinicals/Journal Club - IV	--	25	--	75	100	--	300

Total Hours (Theory) = 532
Total Hours (Practical) = 2012
Total Hours = 2544

MPT (Neurology)

Semester-I

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1101	Research Methodology & Biostatistics	25	--	75	--	100	42	--
MPN-1101	Basic Medical Sciences	25	25	75	75	200	56	56
MPN-1102	Physical and Functional Evaluation of Neurological Disorders	25	25	75	75	200	56	56
MPN-1103	Clinical/Journal Club - I	--	25	--	75	100	--	300

Semester-II

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPT-1202	Skill Enhancing Studies	25	--	75	--	100	42	--
MPT-1203	Exercise Physiology and Nutrition	25	25	75	75	200	56	56
MPN-1204	Medical and surgical aspects of Neurological conditions	25	25	75	75	200	56	56
MPN-1205	Clinicals/Journal Club – II	--	25	--	75	100	--	300

Semester-III

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPN-2306	Basic Physiotherapeutics for Neurological Disorders	25	25	75	75	200	56	56
MPN-2307	Neurosurgical Rehabilitation	25	25	75	75	200	56	56
MPN-2308	Dissertation – I	--	25	--	75	100	--	56
MPN-2309	Practical	--	25	--	75	100	--	56
MPN-2310	Clinicals/Journal Club–III	--	25	--	75	100	--	300

Semester-IV

Subject Code	Subject Title	Internal Assessment		Theory	Practical	Total Marks	Teaching Hours	
		Th	Pr				Th	Pr
MPN-2411	Neurological Rehabilitation	25	25	75	75	200	56	56
MPN-2412	Physiotherapy in Pediatric Neurology	25	25	75	75	200	56	56
MPN-2413	Dissertation – II	--	50	--	150	200	--	126
MPN-2414	Practical	--	50	--	150	200	--	126
MPN-2415	Clinicals/Journal Club - IV	--	25	--	75	100	--	300

Total Hours (Theory) = 532
Total Hours (Practical) = 2012
Total Hours = 2544

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-I

MPT-1101: Research Methodology & Biostatistics

Credit Hours (Per week): 3
Total Hours: 42
Max Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To study research methodology in detail to become a research scholar in future.
2. To learn how to apply research ethically as established by the concerned associations of thearea.
3. To learn importance of systematic and scientific approach to do quality research that will bevaluable in local, regional, national and global scenario.
4. To aspire students towards one particular area of expertise that will add to his/her personal andprofessional growth.
5. To learn how to do quality research searching index journals from right databases and avoidplagiarism, false authorship and conflict of interest.
6. To enhance skill development and update student knowledge about latest and recent developments in the concerned area of expertise.

COURSE CONTENTS:

Research in physiotherapy: Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

Research Design: Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental

design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

Research Process: Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

Measurement of Scaling techniques: Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

Methods of Data Collection: Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

Statistical Reasoning, Processing & Analysis: Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression-Simple and Multiple.

Sampling Fundamentals: Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

Sampling Theory: Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

Measures of Central Tendency and Dispersion- Arithmetic mean, median, mode and standard deviation (application).

Correlation and Regression: Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

Parametric and Non-Parametric Tests (Simple Applications): Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

Multivariate Analysis Techniques: Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

Writing an Research Proposal, Critiquing a Research Article: Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data

Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

Interpretation and Report writing: Meaning, Techniques, Precautions, Significance, Steps and Types.

Publication and Presentation of Research.

BOOKS RECOMMENDED:

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M. Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New Age International Limited, Publishers, Second Edition.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand the importance of research in the relative field.
CO-2	Understand the basic concepts and methods of research.
CO-3	Interpret differences in data distributions via visual displays
CO-4	Calculate standard normal scores and resulting probabilities
CO-5	Calculate and interpret confidence intervals for population means and proportions
CO-6	Interpret and explain a p-value.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-I

MPC-1101: Basic Medical Sciences

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To understand basic life sciences.
2. To know dynamics of Cardiorespiratory system in human body.
3. To know about various Cardiorespiratory disease processes in human body.
4. To understand treatment of various disease processes in human body.

COURSE CONTENTS:

Unit-I

APPLIED ANATOMY AND BIOMECHANICS

- Review of anatomy of cardiovascular system, surface marking of heart and great vessels.
- Review of anatomy of lungs, surface marking of lungs and pleura.
- Respiratory Mechanics: Chest wall mechanics- Movement of ribs, mode of action of intercostals muscle and diaphragm.
- Antagonistic and synergistic action of diaphragm and abdominals, thoracic movement during inspiration and expiration.

Unit-II

APPLIED PHYSIOLOGY

- Physics of diffusion and gas physics.
- Gas laws- Boyle's law, Charles law, Daltons law of partial pressure, Diffusion of gases through respiratory membrane, Ficks law, Henrys law of solubility, Graham's law of diffusion and diffusion capacity.
- Ventilation perfusion relationship –concept of physiological shunt and physiological dead space.
- Physics of ventilation: Pressures changes during ventilation and pressure flow relationship of pulmonary airways, principle of elastance - law of laplace, surface tension and role of surfactant.
- Principle of airway resistance and lung impedance- types of flow-laminar and turbulent flow, work of breathing and ventilatory reserve, static and dynamic lung mechanics.
- Pressure flow relationship, vascular distensibility and compliance, delayed compliance or stress relaxation of vessel.
- Cough reflex.
- Properties of cardiac muscles – electrical properties like excitability, autorhythmicity and conductivity, mechanism and control of cardiac contractile process, length-tension relationship and force-velocity relationship, myocardial contractility and lusitropy.
- Cardiac cycle: Determinants of ejection and filling, starling curves and pressure volume loop, interplay between venous return and cardiac output, neurohumoral response of heart and hemodynamic defense reactions.
- Arterial blood pressure.
- Lymphatic circulation.

Unit-III

- Age related changes in cardiovascular and pulmonary system.
- Body positioning and various systemic changes.
- Difference between adult and pediatric lung.
- Hill equation, Internal and external work of heart, minute work, energy cost of work of heart, cardiac efficiency.

Unit-IV

PHARMACOLOGY

- Cardiovascular drugs
  a. Anti arrhythmic
  b. Anti hypertensive
  c. Drugs used in cardiac failure
- Drugs used in respiratory diseases

BOOKS RECOMMENDED:

1. Arthur Clifton Guyton, John Edward Hall, Textbook of Medical Physiology, Saunders, 2000.
2. Shapiro B, M.D, Clinical Application of Respiratory Care, Year Book, 1979.
3. Braunwald Eugene, Heart Disease – A Textbook of Cardiovascular Medicine, W.B Saunders.
4. Kapandji, The Physiology of the Joints- Annotated Diagrams of the Mechanics of the Human Joints, Churchill Livingstone.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy, and apply this information to understand the mechanisms operating in cardiopulmonary conditions resulting from injury or disease.
CO-2	Understand the importance of, and development of, good written andpresentation skills to aid group learning.
CO-3	Get sound knowledge of the anatomy of the cardiopulmonary system in the body.
CO-4	Get advanced understanding of the relationship between structure and function of the cardiopulmonary system of the healthy and diseased subjects.
CO-5	Develop ability to analyze mechanisms underlying selected cardiopulmonary condition resulting from injury or disease processes.
CO-6	Understand the anatomy / applied anatomy basis for clinical testing cardiopulmonary structures.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-I

MPC-1102: Physical and Functional Evaluation in Cardiopulmonary Disorders

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To learn examination and assessment of cardiorespiratory conditions.
2. To learn various assessment tools used for evaluation and testing.
3. To learn various diagnostic invasive, non-invasive and radiological techniques for diagnosis of condition.

COURSE CONTENTS:

- Cardiopulmonary Assessment.
- A complete physical and functional diagnostic approach to patient presenting with the cardinal symptoms of cardiopulmonary diseases.
- Electrocardiography: Recording and evaluating ECG strip, Imaging Techniques: Chest radiography, Computed Tomography.
- Cardiopulmonary exercise testing: Principles of exercise testing, Exercise testing equipments and testing protocols, Maximal and sub maximal testing.
- Pulmonary Function Testing - Test of lung volumes and capacities, test of gas diffusion.
- Arterial Blood Gas Analysis – measurement of acid base status, Simple acid base disorders (Metabolic acidosis, metabolic alkalosis, respiratory acidosis, and respiratory alkalosis), Compensatory and Mixed acid base disorders.

- Cardiac catheterization and coronary angiography, Complication and risk associated with procedure.
- Special tests: Echocardiography - Principles of Echocardiography, M mode, two dimensional, Doppler and Transesophageal.
- MRI: An Introduction to MRI along with its technical considerations, Interpretation of MRI in various conditions; Ultrasonography.
- Bronchoscopy - Types of bronchoscopy, Indications, Procedure/ technique of bronchoscopy, Associated risks/complications; Techniques for obtaining biological specimens like Sputum specimen and culture, Thoracocentesis/Pleural aspiration and biopsy – indications, contraindications, interpretation of pleural fluid analysis.
- Multisystem assessment and Laboratory Investigations: Elements of multisystem investigation along with their normal values – Blood lipids, complete blood count, coagulation profile, electrolytes, blood urea nitrogen and creatinine, serum glucose.

BOOKS RECOMMENDED:

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.

COURSE OUTCOMES:

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know about how to assess cardiopulmonary conditions
CO-2	Have complete knowledge about various assessment tools
CO-3	Understand various diagnostic techniques involved in cardiopulmonary assessment
CO-4	Be well equipped with cardiopulmonary assessment and diagnose a condition successfully.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-I

MPC-1103: Clinicals/Journal Club - I

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills-

CO-1	Become fully equipped with handling patients practically, make provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Learn skills about how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done in their postings in hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-II

MPT-1202: Skill Enhancing Studies

Credit Hours (Per week): 3
Total Hours: 42
M. Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make students learn how healthcare system works.
2. To make students learn about management skills.
3. To make students know principles of private practice.
4. To give students knowledge about financial and risk management in healthcare set up.
5. To give students knowledge about marketing strategies in healthcare set up.
6. To give students knowledge about history and development, professional conduct and standards of practicing in physiotherapy.
7. To make students aware about codes of ethics, social and mental policies, professional liability and obligation, legal responsibilities and medico legal action in concerns with practicing as a physical therapist.
8. To make students learn about educational technology regarding types, philosophies, agencies; teaching and learning processes, theories of teaching, methods of teaching and other areas of program evaluation and assessment of education.

COURSE CONTENTS:

Unit-I

Management and Ethics in Physiotherapy

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

Unit-II

Educational Technology

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan
- Teaching methods
- A-V aids
- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized,non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

BOOKS RECOMMENDED:

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.
3. J M Synge, Riders to the Sea.
4. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
5. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
6. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
7. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
8. Elligworth, Educational Technology, Peerson, 2006.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know how a healthcare system works.
CO-2	Know management skills and principles to work in healthcare set up
CO-3	Have complete understanding of financial and risk management and marketing strategies in healthcare set up.
CO-4	Have complete knowledge about history and development, professional conduct and standards of practicing in physiotherapy.
CO-5	Know about codes of ethics, social and mental policies, professional liability and obligations, legal responsibility and medico-legal action to work efficiently as a physiotherapist.
CO-6	Be well equipped with knowledge regarding education technology ,its programming and its evaluations along with teaching its theories, tools and skills that increase scope in teaching profession for them.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER - II

MPT-1203: Exercise Physiology and Nutrition

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200

Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make students learn about basics of exercise, in form of energy sources, energy balance, regulation and replacement during exercise.
2. To give them know about physiological processes of exercise.
3. To understand the importance and adverse effects of exercise regulation.
4. To make them equipped with various types and stages of exercise training in variable scenarios.
5. To give them knowledge of how to relate exercise with our cardiovascular system when, why and how to implement it.
6. To make students understand that how human body respond to exercise from point of view of endocrine system.

COURSE CONTENTS:

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins. Metabolism of Carbohydrates, fats and proteins
- Energy balance, Regulation of Calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.
- Obesity–Body composition and assessment, Various diets to reduce Obesity and other

exercise regimes - ACSM guidelines

- Aerobic process- Intensity, duration of Exercises and Calculation of VO2 Max and its variability, How to estimate Aerobic Capacity
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.
- Fatigue-Definition, types, causes and prevention. DOMS and its prevention. Deconditioning.
- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO2 max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits among athletes. Caffeine, alcohol & Exercise.
- Cardiovascular system and exercise
  Athletes heart, cardiovascular adaptations to sustained aerobic exercises
  Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
  Sudden cardiac death in sports
  Regulation of circulations during exercise

- Exercise and Respiratory system
  Athletes lungs
  Regulation of respiration during exercise
- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

BOOKS RECOMMENDED:

1. William D. McArdle, Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.
2. LippinCott Williams and Wilkins.
3. Exercise Physiology and Nutrition Jack H.Wilmore 3rd edition Churchill Livingstone.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Have complete understanding of exercise physiology and how to interpret it in making treatment protocols for their patients.
CO-2	Know about adverse effects of exercise regulation and will know how to treat it.
CO-3	Become trained as professionals to understand stages of exercise training and how to implement it.
CO-4	Have complete knowledge of how exercise impacts cardiovascular system and how body reacts through its endocrinological processes.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-II

MPC-1204: Medical and Surgical Aspects of Cardiopulmonary Conditions

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make student learn about various cardiopulmonary disorders in detail how to access and diagnose them.
2. To make students learn about basic surgical procedures performs in field of cardiopulmonary disorders.

COURSE CONTENTS:

Unit-I

- Obstructive lung diseases
- Restrictive lung diseases
- Suppurative lung diseases
- Infective lung diseases
- Respiratory tract infections
- Occupational and interstitial lung diseases
- Chest trauma
- Chest wall deformities & Neuromuscular disorders

- Lung cancers
- Children with respiratory dysfunction
- Diaphragmatic diseases & Abnormalities
- Sleep apnoea
- Hyperventilation syndrome
- Diseases of the Pleura
- Adult Respiratory Distress syndrome
- Alveolar Proteiniosis
- Drug induced lung disease, Oxygen toxicity and related syndromes.
- Development disorders of the lung

Unit-II

- Congenital heart diseases
- Acquired heart diseases
- Ischemic heart disease
- Diseases of the myocardium
- Pericardial diseases
- Tumors of heart
- Vascular diseases
- Hypertension
- Diabetes and Heart disease
- Peripheral vascular diseases.

Unit-III

Thoracoscopy, video assisted thoracoscopy, lobectomy, pneumonectomy, thoracotomy, pleurodesis, pleurectomy, bullectomy, segmental resection.
CABG, angioplasty, repair of congenital defects, valvoplasties, pericardiectomy, aneurysectomy, cardiac transplant.

BOOKS RECOMMENDED:

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.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand cardiopulmonary disorders briefly and main surgical procedures performed for its management
CO-2	Access all the cardiopulmonary conditions and have knowledge of surgical procedures performed on them also know when, why and how physiotherapy interventions are applied in the concerned scenario.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-II

MPC-1205: Clinicals/Journal Club – II

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100 Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically and make a provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Gain skills about how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPC-2306: Cardiopulmonary Physiotherapy

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. Learn to use different physiotherapy technique for rehabilitation of cardiac and pulmonary conditions.
2. Student will get knowledge about various guidelines for the delivery of cardiopulmonary physical therapy in various conditions.

COURSE CONTENTS:

- Therapeutic Body Positioning: Indications and physiological effects of different body positions, Positioning in neonates/infants.
- 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 cardio-pulmonary therapeutics
- Breathing Exercises, Controlled Diaphragmatic breathing, Facilitation of ventilatory pattern and Breathing strategies, Chest wall mobilization, Ventilatory or respiratory muscle training. Re-patterning techniques.
- Glossopharyngeal Breathing, Pursed lip breathing, relaxed breathing, segmental breathing, indications for each technique.

- Bronchopulmonary hygiene techniques: Percussion, Vibration, Shaking, Quick Stretch coughing, huffing, Postural drainage. Indications, contraindications and precautions of each technique.
- Autogenic drainage, active cycle of breathing techniques.
- Physiological basis for Airway Clearance Techniques, Clinical application of airway clearance techniques and Facilitating airway clearance with coughing techniques
- Guidelines for the delivery of Cardiovascular and Pulmonary Physical Therapy Acute Conditions both medical and surgical including Peripheral vascular disorders
- Guidelines for the delivery of Cardiovascular and Pulmonary Physical Therapy Chronic conditions –Primary and Secondary Cardiopulmonary dysfunction
- Respiratory care Practice Review, Other techniques: Manual Hyperinflation and Airway Suction and its adjuncts like Saline Instillation and Bronchoalveolar Lavage
- Body Mechanics – The art of Positioning and Moving Patients
- The neonatal and Pediatric patient and the aging patient
- PNF techniques In Cardiopulmonary Physiotherapy

BOOKS RECOMMENDED:

1. Cardiovascular and Pulmonary Physical Therapy, 5th Edition from Donna Frownfelter, Elizabeth Dean, London 1988.
2. Essentials of Cardiopulmonary Physical Therapy H. Steven Sadowsky, Ellen A. Hillegass, ISBN-9781437703832.
3. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials) by Jennifer A. Pryor , Ammani S Prasad 2008.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Plan an appropriate treatment regimen based on their knowledge of the subject.
CO-2	Get expertise in various special techniques/ approaches like Chest PNF, Breathing Exercises, autogenic drainage, ACBT, Therapeutic body positioning.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPC-2307: Preventive Cardiology

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. Understanding of risk factors associated with developing heart disease such as age, diet, lifestyle etc.
2. To formulate various training programs for preventing further issues in people who already have cardiovascular disease.

COURSE CONTENTS:

Unit-I

- Cardiorespiratory Disability Evaluation: Definition of Impairment, disability and handicap. Guidelines for assessing pulmonary and cardiac impairment. Questionnaires like CCQ, SF36.
- Cardiorespiratory and Physical Fitness: An overview to physical activity, health and diseases.
- Effect of aging process in the performance of heart and lung.
- Effect of nutrition on heart, lungs and blood vessels.
- The role of physical activity in disease prevention
- Lifestyle modification.
- Role of nutrition and immunization in disease prevention.
- Role of physiotherapy in prevention and rehabilitation of patients with cardiorespiratory diseases.
- Public health approaches to communicable diseases.

Unit-II

- Cardiovascular disease prevention - CINDI protocol, primary and secondary prevention of coronary heart disease.
- Body composition assessment.
- Community Cardiology and Pulmonology.
- Gymnasium and fitness: the concept behind healthy living.
- Aerobic and resistance training programs. Effects of different exercises on heart.
- Disease Prevention Programs in India.
- Telemedicine: An introduction to telemedicine, types of telemedicine, Guidelines and standards for the practice of Telemedicine in India, Scope of practice and future prospects.

BOOKS RECOMMENDED:

1. Principles & Practice of Surgery, Adapted International Edition, 6th Edition, O James Garden, 20 Oct 2017
2. Handbook of Pulmonary & Critical Care Medicine Paperback by S.K Jindal,
3. Textbook of Pulmonary Medicine (Set of 2 Volumes) by Behra
4. Cardiovascular and Pulmonary Physical Therapy, 5th Edition from Donna Frownfelter, Elizabeth Dean, London 1988.
5. Essentials of Cardiopulmonary Physical Therapy H. Steven Sadowsky, Ellen A. Hillegass, ISBN-9781437703832.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the followingskills:

CO-1	Get advanced knowledge of preventive cardiology that will facilitate decision-making.
CO-2	Gain expertise in Cardiorespiratory assessment and disability evaluation.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPC-2308: Dissertation-I

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To make students prepare for clearance of research proposal
2. To make students complete the data collection by the end of this semester

COURSE CONTENTS:

1. The students have to prepare a research proposal of the research project to be undertaken.
2. Students have to submit the soft and hard copy of the research proposal.
3. Power point presentation of the research proposal for the ethical committee clearance.
4. Students have to complete the data collection by the end of this semester.
5. Power point presentation of the research work completed till the end of this semester.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Conduct research independently
CO-2	Demonstrate a commitment to disseminate knowledge through publications and presentations
CO-3	Understand the methods of data collection and analysis of collected data using suitable statistical tests

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPC-2309: Practical

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To synthesize the entire theoretical knowledge into actual clinical situations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till the end of this semester.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients
CO-2	Do self assessment of personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve the profession and community

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPC-2310: Clinicals/Journal Club – III

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically, make a provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Have skills how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-IV

MPC-2411: Cardiac and Pulmonary Rehabilitation

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. An understanding of professional responsibility and ethical principles in relation to individuals and community, both locally and internationally.
2. Acquired the in-depth understanding of the concept of general and community based cardiopulmonary rehabilitation.
3. Be able to impart services and training at the community level effectively.
4. Education of patients, caregivers and health professionals, consultancy and advocacy.

COURSE CONTENTS:

Unit-I

Cardiac Rehabilitation

- Cardiac Rehabilitation: Historical Background, objectives and definition of cardiac rehabilitation, Patients selection and risk stratification.
- Phases of Cardiac Rehabilitation
- 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).

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

Unit-II

Pulmonary Rehabilitation

- Pulmonary Rehabilitation: Principal goals and rationale of pulmonary rehabilitation, Patients' selection and assessment.
- Measurement of respiratory and peripheral muscle strength, assessment of performance of ADL and health status.
- Education and Life style management in Pulmonary Rehabilitation.
- Nutritional and psychological aspects and recent advances in Pulmonary Rehabilitation. Pulmonary Rehabilitation in specific disorders.

BOOKS RECOMMENDED:

1. Pulmonary Rehabilitation - by Casaburi.
2. Guidelines for Pulmonary Rehabilitation Programs-3rd Edition AACVPR
3. Rehabilitation of The Patient With Respiratory Diseases - N.S. Cherniack And M. D.Altose
4. Cardiopulmonary Rehabilitation. S Irwin
5. Gloeckl, R., Marinov, B., & Pitta, F. (2013). Practical recommendations for exercisetraining in patients with COPD.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Get expertise in the community health and function in the general set up.
CO-2	Attain ability as a mandatory member of the team of the health professionals
CO-3	Do patient assessment and treatment planning, including integration and interpretation of patient problems and effective goal setting.
CO-4	Understand physiotherapeutic intervention that is based on a sound base of evidence and sensitive to service delivery models and the culture of both the patient and the organization.

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-IV

MPC-2412: Modalities and Interventions in ICU

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. The course shall enable the candidate to expertise in the knowledge and skill of operating advanced instrumentation at the intensive care area as well as modern investigative procedures.
2. Such candidates shall also attain an ability to function as an essential team member of intensive care units, as well as a team of experts in the cardio-pulmonary rehabilitation general fitness and health promotion at the hospital set-ups.

COURSE CONTENTS:

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

- Physiotherapy management in pediatric and neonatal ICU.
- Complications, Adult Respiratory distress syndrome, acute asthma, shock, sepsis, and mulitorgan system failure.
- ICU management of Neurologic disorders, Essentials for ICU Patient: Patient safety concerns and infection Control.
- Basic and Advanced airway tubes, Monitoring of chest tube drainage and underwater seal system.
- Emergency management of airways: Manual Resuscitators, Suction equipments and suction catheters, Types of oropharengeal airways, Endotracheal intubation, Care of the patient with an Artificial Airway. Extubation and post extubation care.
- 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.
- 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.
- Humidifiers – Principles of operation and clinical indications for humidity therapy, Devices used for humidification; Aerosol drug therapy.
- Advanced Cardiac care: Cardiac Pacemaker – its indications, safety measures and care and Cardioverter Defibrillators.
- Basic Life Support and Advanced Cardiac Life Support: Defibrillator (Types, Waveforms and How to give DC shock).

BOOKS RECOMMENDED:

1. Cardiovascular and Pulmonary Physical Therapy, 5th Edition from Donna Frownfelter,Elizabeth Dean, London 1988.
2. Essentials of Cardiopulmonary Physical Therapy H. Steven Sadowsky, Ellen A. Hillegass,ISBN-9781437703832.
3. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials) by Jennifer A. Pryor , Ammani S Prasad 2008.
4. Chest physiotherapy in Intensive care unit – Makezie,Williams & Wilkins, Baltimore.
5. A Manual of Neonatal Intensive Care - Robert NRC, Edward Arnold, London 1986.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply effectively different physiotherapy technique for rehabilitation of cardiac and pulmonary conditions in ICU
CO-2	Understand the importance of critical care rehabilitation

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-IV

MPC-2413: Dissertation-II

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1. Ability to conduct research independently
2. To make students complete the data collection by the end of this semester
3. Interpretation of data and presentation of complete research work

COURSE CONTENTS:

1. The candidate shall prepare 4 hard and 3 soft (CDs) copies of the dissertation and submit the same to the department office on or before the last working day of this semester.
2. Power point presentation of the complete research work.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to conduct research independently
CO-2	Demonstrate a commitment to dissemination of knowledge through publications and presentations
CO-3	Understand the methods of data collection and analysis of collected data using suitable statistical tests
CO-4	Study new correlation between any variables or may find a suitable advance therapeutic intervention for different conditions

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-IV

MPC-2414: Practical

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1. To synthesize the entire theoretical knowledge into actual clinical situations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients
CO-2	Do self assessment of personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve the profession and community

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-IV

MPC-2415: Clinicals/Journal Club – IV

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two mandatory case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically in viewpoint ofapproaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Get skills about how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

BOOKS RECOMMENDED:

1. Principles & Practice of Surgery, Adapted International Edition, 6th Edition, O JamesGarden, 20 Oct 2017
2. Handbook of Pulmonary & Critical Care Medicine Paperback by S.K Jindal,
3. Textbook of Pulmonary Medicine (Set of 2 Volumes) by Behra
4. Cardiovascular and Pulmonary Physical Therapy, 5th Edition from Donna Frownfelter,Elizabeth Dean, London 1988.
5. Essentials of Cardiopulmonary Physical Therapy H. Steven Sadowsky, Ellen A. Hillegass,ISBN-9781437703832.
6. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics, 4e (Physiotherapy Essentials) by Jennifer A. Pryor , Ammani S Prasad 2008.
7. Chest physiotherapy in Intensive care unit – Makezie,Williams & Wilkins, Baltimore.
8. Cardiopulmonary symptoms in physiotherapy practice- CohenM. Churchill Livingstone.
9. Physiotherapy in Respiratory and Cardiac Care: An Evidence-Based Approach Paperbackby Alexandra Hough, 2014
10. Pulmonary Rehabilitation - by Casaburi.
11. Guidelines for Pulmonary Rehabilitation Programs-3rd Edition AACVPR
12. Rehabilitation of The Patient With Respiratory Diseases - N.S. Cherniack And M. D.Altose
13. Cardiopulmonary Rehabilitation. S Irwin
14. Gloeckl, R., Marinov, B., & Pitta, F. (2013). Practical recommendations for exercisetraining in patients with COPD.
15. Physiotherapy for Respiratory and Cardiac Problems. J Pryor, A Prasad 3. ExercisePrescription – Shankar
16. Irwin S, Techlin JS. Cardiopulmonary Physical Therapy: a guide to practice. St. Louis,Mo.: Mosby Co., 2004.
17. Hillegass E, Sadowsky HS. Essentials of Cardiopulmonary Physical Therapy. W.B. Saunders Co., 2001.
18. Hodgkin JE, Connors GL, Celli BR. Pulmonary Rehabilitation: guidelines to success.Philadelphia: Lippincott Williams & Wilkins Co., 2001.
19. Watchie J. Cardiopulmonary Physical Therapy: a clinical manual. philadelphia: W.B.Saunders Co., 1995.
20. Tecklin JS. Pediatric Physical Therapy. 2nd ed., 1994; pp249-282.
21. Symposium: Respiratory Care. Physical Therapy 1981; 61: 1711~1781.
22. Symposium: Focus on Ventilatory Muscle Training. Physical Therapy 1995; 75:971-1014.
23. Cardiopulmonary symptoms in Physiotherapy - Cohen M, Churchill, Livingstone, London1988.
24. A Manual of Neonatal Intensive Care - Robert NRC, Edward Arnold, London 1986.
25. Exercise Physiology and Physical Education in Athletics - Fox and Mathews.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-I

MPT-1101: Research Methodology & Biostatistics

Credit Hours (Per week): 3
Total Hours: 42
Max Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To study research methodology in detail to become a research scholar in future.
2. To learn how to apply research ethically as established by the concerned associations of thearea.
3. To learn importance of systematic and scientific approach to do quality research that will bevaluable in local, regional, national and global scenario.
4. To aspire students towards one particular area of expertise that will add to his/her personal andprofessional growth.
5. To learn how to do quality research searching index journals from right databases and avoidplagiarism, false authorship and conflict of interest.
6. To enhance skill development and update student knowledge about latest and recent developments in the concerned area of expertise.

COURSE CONTENTS:

Research in physiotherapy: Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

Research Design: Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental

design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

Research Process: Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

Measurement of Scaling techniques: Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

Methods of Data Collection: Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

Statistical Reasoning, Processing & Analysis: Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression-Simple and Multiple.

Sampling Fundamentals: Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

Sampling Theory: Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

Measures of Central Tendency and Dispersion- Arithmetic mean, median, mode and standard deviation (application).

Correlation and Regression: Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

Parametric and Non-Parametric Tests (Simple Applications): Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

Multivariate Analysis Techniques: Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

Writing an Research Proposal, Critiquing a Research Article: Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data

Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

Interpretation and Report writing: Meaning, Techniques, Precautions, Significance, Steps and Types.

Publication and Presentation of Research

BOOKS RECOMMENDED:

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill PublishingCo.
2. Carolyn. M. Hicks, Research for Physiotherapists, Project Design and Analysis, ElsevierHealth Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New Age InternationalLimited, Publishers, Second Edition.

COURSE OUTCOMES:

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand the importance of research in the relative field.
CO-2	Understand the basic concepts and methods of research.
CO-3	Interpret differences in data distributions via visual displays
CO-4	Calculate standard normal scores and resulting probabilities
CO-5	Calculate and interpret confidence intervals for population means and proportions
CO-6	Interpret and explain a p-value.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-I

MPO-1101: Basic Medical Sciences

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To understand basic life sciences.
2. To know dynamics of musculoskeletal system in human body.
3. To know about various musculoskeletal disease processes in human body.
4. To understand treatment of various disease processes in human body.

COURSE CONTENTS:

Unit I: APPLIED ANATOMY

- Review of anatomy of various components of musculoskeletal system
- Joints – classification, structure of joints, movements, range, limiting factors, stability blood supply, nerve supply, and its applied anatomy.
- Origin, insertion, nerve supply and action of all important muscles related to human movement.
- Spine-Vertebral column development, structure, joints, muscles of back, applied and functional anatomy
- Brief description of Upper & lower extremity, thorax, abdomen, pelvis, head, neck and brain.

- A review of organization and regulation of motor system- types of movement and factors affecting contact and range of motion at synovial joints, skeletal muscle fibres- composition, structure and characteristics, muscle metabolism, contraction and relaxation of muscle, control of muscle tension.
- Anatomy of certain diseases- common dislocations, low back pain, sciatica, lesions of inter-vertebral disc, anatomical and physiological loss resulting from nerve injury, peripheral nerve entrapment(such as carpal tunnel syndrome, cubital tunnel syndrome, tarsal tunnel syndrome, Morton neuroma), spinal infection.

Unit II: BIOMECHANICS

- Introduction to human biomechanics- definition of mechanics and biomechanics, principle of biomechanics, nature and importance of biomechanics in physiotherapy, elasticity- definition, stress, strain HOOKE'S law.
- Biomechanics of upper and lower extremity- biomechanics of shoulder, elbow, wrist and hand motion, pelvic, hip, knee, ankle & foot motion.
- Biomechanics of spinal region- biomechanics of cervical, thoracic, lumbosacral, sacroiliac joint.
- Definition, aims, objectives and role of kinesiology in physiotherapy, review of fundamental concepts (applied aspects), centre of gravity, line of gravity, planes, lever system in body, fundamental starting positions.
- Ligament & Tendon mechanics: Structure and composition, Mechanical properties and physiological properties. Cross sectional area measurements Muscle tendon properties Temperature sensitivity
- Joint mechanics : Joint design ,Joint categories ,Joint function - Arthrokinematics - Osteokinematics - Kinematic chains Open Closed Joint forces, equilibrium and distribution of these forces , Joint stability and its mechanics Clinical applications.
- Gait: Normal Gait and its determinants Gait parameter - Kinetic - Kinematics - Time-Space Pathological gait with emphasis on polio, cerebral palsy, dystrophies, hemi paresis, Para paresis Running Stair climbing Changes in gait following various surgeries/ diseases/ disorders

- Kinematics: Types of motion (accessory and joint play of axial and peripheral skeletal) Location of motion (instantaneous axis of movement, shifting axis of movement) Magnitude of motion(factors determining it) Direction 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. Angular motion and its various parameters, linear motion and its various parameters, Projectile motions.

- Kinetics : Definition of forces Force vectors (composition, resolution, magnitude) Naming of Force (gravity and anti-gravity force, JFR), Force and its characteristics, internal and external forces, classification of force system, composition and resolution of forces, impact, elasticity, principles of spin and rebound, eccentric forces, moment, principles of lever, rotator forces, force of gravity and methods to find COG, COG Stability Reaction forces Equilibrium & BALANCE Linear forces system, Friction and its various parameters Parallel force systems, Concurrent force systems, Work power and energy, Moment arms of force & its application, Force components Equilibrium of force, principles of projectile.

- Posture: dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.

- Mechanical energy, work and power: Definitions Positive and Negative work of muscles, Muscle mechanical power, Causes of inefficient movement - Co-contractions - Isometric contraction against gravity jerky movement - Energy generation at one joint and absorption at another - Energy flow and Energy system used by the body - Energy storage

- Advanced Biomechanics and kinesiology

- Introduction to biomechanical analysis of human motion.

- Analytical tools and techniques – Isokinetic Dynamometer, Kinesiological EMG, Electronic Goniometer, Force Platform, Videography, Algometer

Unit III: PHYSIOLOGY

- Physiology of musculoskeletal systems: Fiber length and cross section area. Biophysics of contractile and non contractile tissues, Response to mechanical loading.

- Mechanical properties of various muscles. Types of muscle contractions (static, concentric, eccentric), two joint muscles, angle of pull, role of gravity affecting muscular action. EMG changes during fatigue and contraction.

- Changes in mechanical and physiological properties because of ageing, exercise and immobilization, dystrophies and pathological conditions.

- Blood: the various components of blood, viscosity correlation, oxyhemoglobin dissociation curves, interrelationship between pressure flow and resistance.
- Cardiovascular system: cardiac cycle, cardiac output and its regulation, cardiac output in normal stress conditions, methods of measuring cardiac output, oxygen demand theory of local blood flow circulation, mechanism of arterial pulse regulation, hypertension, normal coronary blood flow along with variations, the cardiac reserve, physiological causes of shock.
- Respiratory system: review of mechanics of respiration, pulmonary volumes and capacities, transport of oxygen in blood, carbon dioxide in blood, regulation of respiration, respiratory abnormalities hypoxia, hypercapnoea, artificial respiration, disorders of respiration- dysnoea, orthopnoea, hyperventilation, apnoea, tachypnea, respiratory changes during exercise.
- 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.
- Cell injuries: aetiology and pathogenesis with a brief recall of important aspects of normal cell structure, reversible cell injury, irreversible cell injury, pathologic calcification, Inflammation.
- Repair, wound healing by primary and secondary union, factors promoting and delaying the process, healing in specific site including bone healing. 'Failed' healing responses, repair of soft tissue injuries, principles of drug action, basic pharmacokinetics and pharmacodynamics.

UNIT IV: PHARMACOLOGY

Drugs used in orthopedic conditions:

- Analgesics
- Muscle relaxants
- corticosteroids
- Non-steroidal anti- inflammatory drugs (NSAIDs)
- Disease modifying anti-rheumatic drugs (DMARDs)

The use of drugs in various cardiovascular disorders
The use of drugs in various neurological disorders
The use of drugs in various respiratory disorders

BOOKS RECOMMENDED:

1. Arthur Clifton Guyton, John Edward Hall, Textbook of Medical Physiology, Saunders, 2000.

2. Kapandji, The Physiology of the Joints- Annotated Diagrams of the Mechanics of the Human Joints, Churchill Livingstone

3. Williams & Warwick Gray's Anatomy - - Churchill Livingstone.

4. Snells , Clinical Anatomy for Medical Students - – Lippincott.

5. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan.

6. Joint structure and function- a comprehensive book -Cynthia Norkin

7. Kisner and Colby: Therapeutic Exercises- Foundations and Techniques. F.A. Davis

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy and apply this information for understanding the mechanisms operating in orthopedic conditions resulting from injury or disease.
CO-2	Have sound knowledge of the anatomy of the musculoskeletal system in the body.
CO-3	Get advanced understanding of the relationship between structure and function of the musculoskeletal system of the healthy and diseased subjects.
CO-4	Develop ability to analyze mechanisms underlying selected orthopedic conditions resulting from injury or disease.
CO-5	Get advanced understanding on the anatomy/applied anatomy basis for clinical testing musculoskeletal structures.
CO-6	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy and apply this information for understanding the mechanisms operating in orthopedic conditions resulting from injury or disease.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-I

MPO-1102: Physical and Functional Evaluation in Musculoskeletal Disorders

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To learn assessment of musculoskeletal conditions.
2. To learn various assessment tools used for evaluation and testing.
3. To learn examination and assessment in various areas like sports and geriatrics.
4. To learn various diagnostic radiological techniques for diagnosis of condition.

COURSE CONTENTS:

- Review of General Musculoskeletal assessment – patient's history, observation, palpation and examination.
- Specific scales according to orthopedic disorders.
- Sensory and Motor assessment
- Balance assessment: scales, Balance Outcome measures and there administration.
- Assessment of Tone, flexibility, tightness of musculoskeletal tissues, end-feel.
- Muscle Length Testing and special tests
- Reflex testing

- Limb length measurement: recent methods for assessment and its clinical applications
- Postural assessment methods and common deviations from the normal
- Clinical Gait assessment (observational methods and EMG gait analysis)
- Functional assessment
- Brief review of imaging techniques: X-Ray, MRI, CT, ultrasonography, Biopsy report reading and analysis. Imaging of head, neck, spine, thorax and abdomen, upper and lower extremity.
- Examination and assessment of geriatric patient
- Examination and assessment of Upper Extremity, lower extremity & Examination of Spine
- Sports assessment and training.

BOOKS RECOMMENDED:

1. Robert A Donatelli, Orthopaedic Physiotherapy, Churchill Livingstone.

2. Susan Sullivan, Physical Rehabilitation Assessment and Treatment, Jaypee brother

3. David J Magee, Orthopaedic Physical Assessment, Saunders

4. Carolyn Wadsworth, Manual Examination and Treatment of the Spine and Extremities, Williams and Wilkins.

5. Ronald C Evans, Illustrated Orthopaedic physical Assessment, Mosby.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know about how to assess musculoskeletal conditions
CO-2	Have complete knowledge about various assessment tools
CO-3	Have knowledge on the assessment done in various areas like sports and geriatrics
CO-4	Understand various diagnostic techniques involved in musculoskeletal assessment
CO-5	Become well equipped with musculoskeletal assessment and learn to diagnose the condition successfully.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-I

MPO-1103: Clinicals/Journal Club - I

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up
2. To make students observe practically how physiotherapy works in multispecialty hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals andpresent them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES:

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically and make provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Have skills about how to present case studies, scientific papers in journals and in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals and record their experiences in writing to guide their juniors.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-II

MPT-1202: Skill Enhancing Studies

Credit Hours (Per week): 3
Total Hours: 42
M. Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make students learn how healthcare system works.
2. To make students learn about management skills.
3. To make students know principles of private practice.
4. To give students knowledge about financial and risk management in healthcare set up.
5. To give students knowledge about marketing strategies in healthcare set up.
6. To give students knowledge about history and development, professional conduct and standards of practicing in physiotherapy.
7. To make students aware about codes of ethics, social and mental policies, professional liability and obligation, legal responsibilities and medico legal action in concerns with practicing as a physical therapist.
8. To make students learn about educational technology regarding types, philosophies, agencies; teaching and learning processes, theories of teaching, methods of teaching and other areas of program evaluation and assessment of education.

COURSE CONTENTS:

Unit-I

Management and Ethics in Physiotherapy

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

Unit-II

Educational Technology

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan
- Teaching methods
- A-V aids

- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized, non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

BOOKS RECOMMENDED:

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.

   J M Synge, Riders to the Sea.
3. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
4. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
5. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
6. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
7. Elligworth , Educational Technology, Peerson, 2006.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know about how a healthcare system works.
CO-2	Know management skills and principles to work in healthcare set up
CO-3	Have understanding of financial and risk management and marketing strategies in healthcare set up.
CO-4	Have complete knowledge about professional conduct and standards of practicing in physiotherapy.
CO-5	Know about code of ethics, social and mental policies, professional liability and obligations, legal responsibility and medico-legal action required for working efficiently as a physiotherapist.
CO-6	Be well equipped with knowledge regarding education technology, its programming and evaluations along with its theories, tools and skills that will enhance their scope in teaching profession .

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER II

MPT-1203: Exercise Physiology and Nutrition

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

7. To make students learn about basics of exercise, in form of energy sources, energy balance, regulation and replacement during exercise.
8. To give them know about physiological processes of exercise.
9. To understand the importance and adverse effects of exercise regulation.
10. To make them equipped with various types and stages of exercise training in variable scenarios.
11. To give them knowledge of how to relate exercise with our cardiovascular system when, why and how to implement it.
12. To make students understand that how human body respond to exercise from point of view of endocrine system.

COURSE CONTENTS:

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins.

  Metabolism of Carbohydrates, fats and proteins.

- Energy balance, Regulation of calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.

- Obesity–Body composition and assessment, various diets to reduce Obesity and other exercise regimes - ACSM guidelines.
- Aerobic process- Intensity, duration of Exercises and Calculation of VO2 Max and its variability, How to estimate Aerobic Capacity.
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining.
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.
- Fatigue-Definition, types, causes and prevention. DOMS and its prevention. Deconditioning.
- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO2 max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits among athletes.Caffeine, alcohol & Exercise.
- Cardiovascular system and exercise
  Athletes heart, cardiovascular adaptations to sustained aerobic exercises. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.

  Sudden cardiac death in sports

  Regulation of circulations during exercise

- Exercise and Respiratory system

  Athletes lungs

  Regulation of respiration during exercise

- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

BOOKS RECOMMENDED:

1. William D. McArdle , Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.

2. LippinCottWilliams and Wilkins.

3. Exercise Physiology and Nutrition Jack H.Wilmore 3rd edition Churchill Livingstone.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Have complete understanding of exercise physiology and how to interpret it in making treatment protocols for their patients.
CO-2	Know about adverse effects of exercise regulation and its treatment.
CO-3	Get trained as professional to understand stages of exercise training and how to implement it.
CO-4	Have complete knowledge on how exercise affects cardiovascular system and how body reacts through its endocrinological processes.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-II

MPO-1204: Medical and Surgical Aspects of Orthopedic Conditions

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make student learn about various musculoskeletal disorders in detail how to access and diagnose them.
2. To make students learn about basic surgical procedures performs in field of orthopedics.

COURSE CONTENTS:

Unit-I

1. Introduction, causes, mechanism, epidemiology of disease pattern, Patho physiology, Clinical presentation, conservative and surgical management, preventive measures & complications of the following clinical conditions:

- General Musculoskeletal Disorders
- Regional musculoskeletal Disorders
- Congenital malformations
- Rheumatic disorders

- Infections of musculoskeletal system
- Metabolic and endocrine disorders
- Tumors of the musculoskeletal system
- Neuromuscular disorders
- Disorders and malformations in spine
- Degenerative disorders
- Developmental disorders
- Bony and soft tissues disorders.
- Fractures and dislocations of upper limb
- Fractures and dislocations of lower limb
- Fractures and dislocations of spine and Hand
- Spinal cord injuries: types, classification, examination.

2. Parameters used to determine diagnosis of postural disorders of spine, upper extremity and lower extremity.

3. Orientation and Introduction, physical basis, normal result & common abnormal response of the procedures done for musculoskeletal conditions (in brief): X- ray, Computerized Tomography, Magnetic Resonance Imaging, Bone Scan, Laboratory tests, FNAC, Bone biopsy

UNIT- II

Orientation and General Principles of Orthopaedic surgery: Arthrodesis, Osteotomy, Arthroplasty, Bone grafting, Correction of bone deformities and joint contractures, Tendon transfers, Nerve suturing and grafting, replacements, Fracture management- first aid and advance action.

BOOKS RECOMMENDED:

2. Weinstein SL and BuckwalterJA ,Turek'sOrthopaedics: Principles and their Application, Lippincott

3. Louis Solomon, Apley's System of Orthopaedics and Fractures , Arnold publishers.

4. Adams, Textbook of Orthopaedics, Churchill Livingstone

5. Brent Brotzman, Clinical Orthopaedic Rehabilitation.

6. Robert A Donatelli, Orthopaedic Physiotherapy, Churchill Livingstone.

7. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand orthopaedic disorders briefly and main surgical procedures performed for its management
CO-2	Access all the orthopaedic conditions and have knowledge of surgical procedures performed on patients and also understand about when, why and how physiotherapy interventions are applied in the concerned scenario.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-II

MPO-1205: Clinicals/Journal Club - II

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically and make provisional diagnosis and plan a physiotherapy treatment protocol
CO-2	Learn skills about how to present case studies, scientific papers in journals and in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals by recording their experiences, which will be of great help to their juniors.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-III

MPO-2306: Physiotherapy Management in Orthopedic Conditions

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To impart specialized knowledge about the common musculoskeletal conditions and drug management in orthopaedics.
2. To impart knowledge about the common surgeries in orthopaedic conditions and its physiotherapy management.
3. To make students independently determine, diagnose and manage various postural disorders of spine and extremities.
4. To help students understand the role of kinesiology in physiotherapy and know its fundamental principles.

COURSE CONTENTS: Unit-I

Physiotherapeutic management of following:

- General Musculoskeletal Disorders
- Regional musculoskeletal Disorders
- Congenital malformations
- Rheumatic disorders

- Infections of musculoskeletal system
- Metabolic and endocrine disorders
- Tumors of the musculoskeletal system
- Neuromuscular disorders
- Disorders and malformations in spine
- Degenerative disorders
- Developmental disorders
- Bony and soft tissues disorders.
- Fractures and dislocations of upper limb
- Fractures and dislocations of lower limb
- Fractures and dislocations of spine and Hand
- Spinal cord injuries- types, classifications, examination and management.

Unit-II

- Method of different types of common surgeries and its Physiotherapy management : Menisectomy, Patellectomy, Arthoplasties, Arthrodesis, Spinal Fusion, Osteotomies, bone grafting, bone lengthening, nerve repair and grafting, internal and external fixations, distraction and limb reconstruction.
- Orthopedic implants: design, material, indications, pre and post op complications.
- Rehabilitation of Burns
- Amputation: Types, Levels & procedures, Pre and postoperative rehabilitation, Prosthesis and stump care, Limb transplantation Surgery.

Unit-III

- Parameters used to determine, diagnosis and management of postural disorders of spine, upper extremity, lower extremity.
- Correction of gait disorders.
- Fracture management- first aid and advance action.

Unit-IV

Human Kinesiology: definitions, aims, objectives and role of kinesiology in Physiotherapy, fundamental starting positions, framework of the body, origin, insertion, nerve supply and action of all the important muscles related to human movement, impact, principles of spin and rebound, methods of finding center of gravity, principles of equilibrium and projectile.

BOOKS RECOMMENDED:

1. Weinstein SL and Buckwalter JA, Turek's Orthopaedics: Principles and their Application, Lippincott

2. Louis Solomon, Apley's System of Orthopaedics and Fractures, Arnold publishers.

3. Physical Examination of the Spine and Extremities (Hoppenfield, Physical Examination of the Spine and Extremity)

4. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)

5. Textbook of Orthopaedics, Adams: Churchill Livingstone

6. Clinical Orthopaedic Rehabilitation, Brent Brotzman

7. Textbook of Orthopaedics, Adams: Churchill Livingstone

8. Textbook of Orthopaedics, John Ebnezar, Japee Brothers

9. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins

10. Kinesiology and applied anatomy, Lee and Fabiger. 2002

COURSE OUTCOMES (CO):
On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Have the basic biomechanical and patho-mechanical knowledge about the common musculoskeletal conditions and drug management in orthopedics.
CO-2	Become proficient to assess different kind of musculoskeletal conditions in physiotherapy.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-III

MPO-2307: General Orthopedic Physiotherapy

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To give overview of the basic techniques in physiotherapy.
2. To give overview of the various electrotherapeutic modalities used in the management of musculoskeletal disorders.
3. To impart knowledge to the students about the latest advancements in the field of physiotherapy.

COURSE CONTENTS:

Unit-I

• Review of Basic Techniques: Stretching (principals and methods),Strengthening (principals and methods), Passive movements testing and end feel assessment, Active exercise training , its benefits and various methods, Assisted resisted exercise training, Resisted exercise training. Its uses and disadvantages in comparison with other forms of exercise training, Introduction to manual therapy- joint techniques, basic principles of manipulation for various disorders of the spine and extremities. Postural Re-education (methods and techniques), Pain management with emphasis on pain of peripheral origin and Central origin.

• Principle of therapeutic exercises: Definition, details of effects and uses of following exercises:

a. Dynamic Exercises

b. Plyometric Exercises

c. Isokinetic Exercises

d. Kinetic chain exercises

e. PRE

• Review of Principles underlying the application of following modalities with reference to their Production, biophysical and therapeutic effects, indications and contraindications and the specific uses of: Superficial heating modalities, deep heating modalities, Ultrasound, infrared rays, paraffin wax bath, moist heat pack, fluidotherapy, LASER, UVR, Low Frequency Current: direct current, modified direct current, alternative current,Diadynamic Current, Iontophoresis, High Voltage Pulsed Galvanic Stimulation, TENS, medium frequency current, IFT, Russian Currents. High frequency current: SWD, MWD, Ultrasound.

• Hydrotherapy- physiological effects, raising temperature baths, baths with additives, whirlpool bath. Rehabilitation approach using hydrotherapy.

• Cryotherapy- physiological effects, use of cold therapy in acute phase, rehabilitative phase, preventive phase of injury, methods of application, indications and contraindications.

• Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scars keloids, Muscle Plasticity & Integumentary Conditions.

• Biofeedback, extracorporeal shock wave, magneto therapy, light therapy, long wave diathermy, gait analysis.

UNIT-II

• Electro diagnosis: introduction to methods of electro diagnosis SD-CURVE

• Electromyography: technique of EMG, interpretation of normal and abnormal responses

• Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurement of NCV of nerves of upper limb and lower limb, interpretations of normal and abnormal responses. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP

BOOKS RECOMMENDED:

1. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A.Davis.
2. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
3. Kendall: Muscles – Testing and Function - Williams & Wilkins
4. Daniels and Worthinghams: Muscle Testing-Techniques of Manual examination, W.B. Saunders.
5. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications, W.B.Saunders
6. William E. Prentice: Therapeutic Modalities in Sports Medicine - Mosby.
7. William E. Prentice: Rehabilitation Techniques - Mosby.
8. Claytons Electrotherapy 10th Ed. - Sarah &Bazin - W.B. Saunders
9. Nelson and Currier: Clinical Electrotherapy, Prentice Hall.B. Saunders
10. Lehmann- Therapeutic Heat and Cold- Williams & Wilkins, 4thed, 1990.
11. Michlovitz- Thermal Agents in Rehabilitation- F.A.Davis, 1996

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Demonstrate an understanding about the principles of different schools of therapy.
CO-2	Know physiotherapeutic management of common musculoskeletal conditions.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-III

MPO-2308: Dissertation-I

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

3. To make students prepare for clearance of research proposal
4. To make students complete the data collection by the end of this semester

COURSE CONTENTS:

6. The students have to prepare a research proposal of the research project to be undertaken.
7. Students have to submit the soft and hard copy of the research proposal.
8. Power point presentation of the research proposal for the ethical committee clearance.
9. Students have to complete the data collection by the end of this semester.
10. Power point presentation of the research work completed till the end of this semester.

COURSE OUTCOMES (CO):
On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to conduct research independently
CO-2	Demonstrate commitment to disseminate knowledge through publications and presentations
CO-3	Understand the method of data collection and analysis of collected data using suitable statistical tests

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-III

MPO-2309: Practical

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To synthesize the entire theoretical knowledge into actual clinical situations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till this semester.

COURSE OUTCOMES (CO):
On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients
CO-2	Do self assessment of their personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve their profession and community

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-III

MPO-2310: Clinicals/Journal Club – III

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Be fully equipped with handling patients practically and make a provisional diagnosis and plan a physiotherapy treatment protocol
CO-2	Have skills to present case studies, scientific papers in journals and in front of experts in the field.
CO-3	Leave their valuable experiences which they gain during their postings in hospitals for the guidance to their juniors.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-IV

MPO-2411: Bioengineering and Rehabilitation Principles

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. An overview to the students about the conceptual framework of rehabilitation
2. To impart knowledge about the principles of orthotics and prosthetics
3. An outline of the principles and methods of rehabilitation in various types of disabilities

COURSE CONTENTS:

UNIT -I

- Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation. International classification of functioning

- Epidemiology of disability with emphasis on locomotor disability, impact of disability on individual, family, and society.

- Preventive aspects of disability and organizational skills to run disability services
- Model of service delivery: feature, merits and demerits of institutional based rehabilitation, outreach programmes, Community based rehabilitation

- Legal Aspect in Disabilities: PWD act, national trust act, RCI act, Statutory provisions Schemes of assistance to persons with disabilities
- Govt and NGO participation in disability RCI
- WCPT guidelines
- Principles of Orthotics- types, indications, contra indications, assessment (check out), uses and fitting –region wise: Orthotics for the Upper Limb, lower limb and spine.
- Principles of prostheses- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

UNIT- II

- An outline of principles and methods of rehabilitation of speech and hearing disability
- An outline of principles and methods of vocational and social rehabilitation
- An outline of principles and methods of rehabilitation of mentally handicapped
- An outline of principles, methods and scope of occupational therapy
- Architectural Barriers: Describe architectural barriers and possible modifications with reference to Rheumatoid Arthritis, CVA, Spinal Cord Injury and other disabling conditions.
- An outline of the principles and process of disability evaluation
- Physiotherapy in home setting and use of assistive aids, external aids, appliances, and adaptive self-help devices: Prescription, biomechanics, checkout and training.
- Community based rehabilitation in musculoskeletal disorders.
- Wheelchair prescription and advanced skills
- Transfer technique

Unit-III

- Activities of daily living (ADLs)
- Professional ethics for physiotherapist: concept of morality, ethics and legality, professionalism, sexual and physical abuse, social characteristics and personal relationships, professional issues, client interest and satisfaction, confidence and communication, malpractice, negligence, rights of patients, status of physiotherapist in health care.

BOOKS RECOMMENDED

1. Lusardi, Orthotics and Prosthetics in Rehabilitation, 2e, Elsevier.

2. Nawoczeski, Orthotics in Functional Rehabilitation of the Lower Limb. Elseivier

3. Susan Sullivan, Physical Rehabilitation Assessment and Treatment, Jaypee brothers

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand the concept of rehabilitation; role of different team members and agencies and legal aspects in disabilities
CO-2	Understand the uses and fitting of orthosis and prosthesis-region wise
CO-3	Plan and execute various rehab protocols
CO-4	Understand the professional ethics required for physiotherapist

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-IV

MPO-2412: Approaches in Musculoskeletal Physiotherapy

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To incorporate the knowledge of various evidence based advances available recently in physiotherapeutic approaches and
2. To incorporate the knowledge of adjunct treatment methods in managing the MS conditions

COURSE CONTENTS:

UNIT-I

I. Pain management
II. Back School
III. Butler mobilization of nerves
IV. Manual Therapy: Introduction, History, Basic Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization like:

a) Cyriax, c) Mulligan e) Mckenzie
b)Maitland d) Kalterborne f) Combined movement therapy

V. Trigger point therapy
VI. Group exercises
VII. Taping: Principles of taping and application – rigid and dynamic taping
VIII. The concept of mobilization: Mennel

XI. Segmental stabilization concepts of spine: muscle function in spinal stabilization, contribution of various muscles to spinal stabilization, local muscle dysfunction in low back pain, principles of clinical management of deep muscle system for segmental stabilization.

UNIT-II

- Principles of soft tissue mobilizations: Myofasical Release: Concept & brief discussion of its application technique, Muscle Energy Techniques, Positional release technique, neural tissue mobilization, INIT.
- Principles and application of neuromuscular facilitation techniques including PNF.
- Massage: Historical development, Definition and classification of massage techniques, Physiological effects of massage, Description of the techniques of the connective tissue massage, Physiological basis of massage, underwater massage, mechanical devices of massage, Therapeutic applications and contraindications of massage.
- Aquatic therapy.

Unit-III

Anthropometry

- Role of anthropometric knowledge in physiotherapy, age determination: skeletal age, dental age.
- Body measurements- gross size and mass, lengths or heights of body parts, circumferences of body parts, skinfold thickness.
- Anthropometric study group measurements- planes of the body, axes of the body, landmarks on the body.
- Body composition- different body compositions, various methods to estimate body composition- anthropometric determination of the body composition(skinfold thickness), application of surface anthropometry (the body profile)
- Somatotyping- Sheldon's method of somatotyping- critical evaluation of method of somatotyping, Heath- Carter method of somatotyping- the rating scales, anthropometric measurements, first, second and third components, somatotype distribution.

BOOKS RECOMMENDED:

1. Leon chaitow , Muscle Energy Technique,Churchill Livingstone.

2. GD Maitland, Maitland's vertebral Manipulation, Butterworth Heinemann.

3. James Cyriax, Textbook of Orthopaedic Medicine AITBS Publishers.

4. GD Maitland, Peripheral Manipulation, Butterworth Heinemann.

5. Leon chaitow , Position Release Technique,Churchill Livingstone.

6. Brain Mulligan, Manual Therapy,

7. Butler Butler Neural mobilization

8. A.G. Sinha, Principles and Practices of therapeutic Massage.Jaypee.

9. Andrea Bates and Norm Hanson: Aquatic Exercise Therapy, W.B. Saunders

10. Ostym, Beunenand Simons: Kinanthropometry II, University Park Press, Baltimore, 1998.

11. James A.P.Day : Perspectives In Kinanthropometry, Human Kinetics Publishers, Inc. Champaign, Illinos, 1998.

12. Koley S., Textbook of Anthropometry, AITBS

13. Singh and Malhotra: Kinanthropometry, Lunar Publications, 3rded

14. Verma and Mokha: Nutrition, Exercise and Weight Reduction, Exercise Science Publication Society, 3rd Ed.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand various recent approaches in physiotherapy like Butler mobilization of nerves,cyriax, maitland, kalterborne, mckenzie etc.
CO-2	Understand and perform recent soft tissue mobilization techniques.
CO-3	Understand anthropometry and its various techniques.

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER IV

MPO-2413: Dissertation-II

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1. Ability to conduct research independently
2. To make students complete the data collection by the end of this semester
3. Interpretation of data and presentation of complete research work

COURSE CONTENTS:

1. The candidate shall prepare 4 hard copies of the dissertation and submit the same to the department office on or before the last working day of this semester.

2. Power point presentation of the complete research work.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to conduct research independently
CO-2	Demonstrate a commitment to disseminateknowledge through publications and presentations
CO-3	Understand the methods of data collection and analysis of collected data using suitable statistical tests
CO-4	Find correlation between variables to find suitable advance therapeutic intervention for different conditions

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-IV

MPO-2414: Practical

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1.To synthesize the entire theoretical knowledge into actual clinical situations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients
CO-2	Do self assessment of their personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve the profession and community

MASTER OF PHYSIOTHERAPY (ORTHOPEDICS) SEMESTER-IV

MPO-2415: Clinicals/Journal Club – IV

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to naïve entrants and as a college valued documents for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two mandatory case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Be fully equipped with handling patients practically in viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Develop skills to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

BOOKS RECOMMENDED:

1. Gray's Anatomy- Williams & Warwick – Churchill Livingston
2. Joint structure and function- a comprehensive book -Cynthia norkins
3. Clinical Anatomy for Medical Students- Snell's -Lippincott.
4. Text Book of Medical Physiology- Guyton – Mosby.
5. Pathologic Basis of Diseases- Robbins, Kotran and Kumar – W.B Saunders
6. Pharmacology and Pharmacotherapeutics, R.S Satoskar- Popular Publications, Bomby.
7. Pharmacology- Praseem K. Das - Churchill Livingstone.
8. Essential of Medical Pharmacology – K.D Tripathi - Jaypee Brothers.
9. General Pathology- Walter & Israel – Churchill Livingstone.
10. Muirs Textbook of Pathology, Anderson- Edwards Arnold Ltd.
11. Textbook of Pathology- Harsh Mohan- Jaypee Brothers.
12. Pathology: Implications for Physical Therapists – Goodmann and Boissonnault – W.E Saunders.
13. Essential of Medical Microbilogy – Bhatia &Lal – Jaypee Brothers.
14. Microbiology & Introduction for the Health Sciences - Ackerman and Richards – W.B. Saunders Co.
15. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000).
16. Fundamentals of Exercise Physiology: For fitness Performances and Health, Robergs RA, and Roberts, S.O McGraw Hill (2000).
17. Exercise Physiology: Powers, SK and Howley ET. 4th edn; McGraw Hill (2001)
18. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
19. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA,Fahey, TD, White, TP. Mayfield Publishing Company (1996)
20. McArdle, WD, Katch, FI &Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.
21. Text Book of Medical Biochemistry- MN Chatterjea- RanaShinde- Japyee.
22. Johan Low & Reed: Electro therapy Explained, Butterworth.
23. Joseph Kahn: Principles and practice of Electrotherapy, Churchill Livingstone.

24. Claytons Electrotherapy 10th Ed. – Sarah &Bazin- W.B Saunders.

25. Therapeutic Exercise, Basmajian, Williams & Wilkins.

26. Therapeutic Exercise Foundation & Techniques, Kisner Colby, Japyee.

27. A.G. Sinha, Principles and Practices of therapeutic Massage.Jaypee.

28. Orthotics and Prosthetics in Rehabilitation, 2e Lusardi, Elsevier.

29. Orthotics in Functional Rehabilitation of the Lower Limb. Nawoczenski, Elseivier.

30. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi.

31. Woods & Baker: Beard's Massage, W.B Saunders.

32. Kendall: Muscles – Testing and Function – Williams & Wilkins.

33. Daniels and Worthinghams: Muscle Testing – Techniques of Manual. , W.B Saunders.

34. Norkin& White: Measurement of Joint Motion – A Guide to Goniometry.

35. Luttgens K. Hamilton N.: Kinesiology – Scientific Basis of Human Motion 9th Ed, 1997, Brown & Benchmark.

36. White and Punjabi – Biomechanics of Spine - Lippincott.

37. Basmajian – Muscle alive- Williams & Wilkins.

38. Muscle Energy Technique, Leon Chaitow, Churchill Livingstone.

39. Maitland's vertebral Manipulation, GD Maitland, Butterworth Heinemann.

40. Cyriax's Illustrated Manual of Orthopaedic Medicine, JH Cyriax, Butterworth.

41. Position Release Technique, Leon Chaitow, Churchill Livingstone.

42. Manual Therapy, Brain Mulligan.

43. Butler Neural mobilization, Butler.

44. Kapandji: Physiology of Joints Vol. I, II, & III, W.B Saunders.

45. Methods in Biostatistics – Mahajan- J.P.

46. Research for Physiotherapist: Project Design and Analysis - Hicks Churchill Livingstone.

47. Biostatics: The manual for Statistical methods for use in health and nutrition – K.V. Rao – J.P.

48. Turek'sOrthopaedics: Principles and their Application , Weinstein SL and Buckwalter JA, Lippincott

49. Apley's System of Orthopaedics and Fractures, Louis Solomon, Arnold publishers.

50. Textbook of Orthopaedics, Adams: Churchill Livingstone0

51. Clinical Orthopaedic Rehabilitation, Brent Brotzman.

52. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.

53. Tidy's Physiotherapy, Ann Thomasons, Varghese publishing House.

54. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers

55. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.

56. Pain Series Rene Calliet., Japee Brothers.

57. Physical therapy of shoulder, Robert A Donatelli, Churchill Livingston

58. Geriatric physiotherapy Guccione AA, Mosby.

59. Hand practice, Principle and Practice, Mauren Salter, Butterworth Heinemann.

60. Essentials of Orthopaedics and Applied Physiotherapy ,JayantJoshi,prakashKotwal; Churchill Livingstone

61. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins.

62. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.

63. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Jaypee brothers

64. Manual Examination and Treatment of the Spine and Extremities, Carolyn Wadsworth, Williams and Wilkins.

65. Illustrated Orthopaedic physical Assessment, Ronald C Evans, Mosby.

66. Physical Examination of the Spine and Extrimities, Stenley, Lipenfield.

67. Clinical Orthopaedic Examination, Mc Rae, Churchill Livingstone.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-I

MPT-1101: Research Methodology & Biostatistics

Credit Hours (Per week): 3
Total Hours: 42
M. Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To study research methodology in detail to become a research scholar in future.
2. To learn how to apply research ethically as established by the concerned associations of thearea.
3. To learn importance of systematic and scientific approach to do quality research that will bevaluable in local, regional, national and global scenario.
4. To aspire students towards one particular area of expertise that will add to his/her personal andprofessional growth.
5. To learn how to do quality research searching index journals from right databases and avoidplagiarism, false authorship and conflict of interest.
6. To enhance skill development and update student knowledge about latest and recent developments in the concerned area of expertise.

COURSE CONTENTS:

Research in physiotherapy: Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

Research Design: Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

Research Process: Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

Measurement of Scaling techniques: Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

Methods of Data Collection: Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

Statistical Reasoning, Processing & Analysis: Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression-Simple and Multiple.

Sampling Fundamentals: Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

Sampling Theory: Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

Measures of Central Tendency and Dispersion- Arithmetic mean, median, mode and standard deviation (application).

Correlation and Regression: Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

Parametric and Non-Parametric Tests (Simple Applications): Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

Multivariate Analysis Techniques: Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

Writing an Research Proposal, Critiquing a Research Article: Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

Interpretation and Report writing: Meaning, Techniques, Precautions, Significance, Steps and

Types

Publication and Presentation of Research.

BOOKS RECOMMENDED:

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M. Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New Age International Limited, Publishers, Second Edition.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand the importance of research in the relative field.
CO-2	Understand the basic concepts and methods of research.
CO-3	Interpret differences in data distributions via visual displays
CO-4	Calculate standard normal scores and resulting probabilities
CO-5	Calculate and interpret confidence intervals for population means and proportions
CO-6	Interpret and explain a p-value.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-I

MPN-1101: Basic Medical Sciences

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M. Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To understand basic life sciences.
2. To know dynamics of nervous system in human body.
3. To know about various neurological disease processes in human body.
4. To understand treatment of various neurological disease processes in human body.

COURSE CONTENTS:

Unit-I

NEURO ANATOMY

- Knowledge of Central Nervous system.
- Nerve plexus of the body with their distributions (Cervical Plexus, Brachia! plexus, Lumbosacral plexus).
- Revision of brain, meninges, and spinal cord, Outline of Ventricles, Brain stem
- Introduction to Head & Neck.
- Revision of blood supply to the brain and spinal cord and development of nervous system

Unit-II

NEURO PHYSIOLOGY

1. Neuron and Neuroglia
2. Peripheral nerves
3. Spinal cord
4. Medulla
5. Pons
6. Midbrain
7. Cerebellum
8. Basal ganglia
9. Higher Intellectual Functions
10. Cranial Nerves
11. Cerebrum
12. Reticular and Limbic system
13. Autonomic nervous system
14. Ventricular system
15. Special senses
16. Physiology of Pain
17. Neuroplasticity
18. Cerebrospinal Fluid

Unit-III

Joints mechanics and gait: Biomechanics of spinal motion.(in brief), Biomechanics of upper and lower limbs (In brief), Gait parameters, Kinetics, Kinematics, Time- Space, Gait analysis, Control of normal mobility, Essential requirements for successful locomotion, Control Mechanisms for gait, Initiating gait and changing speeds, Mobility Other than gait. A life span Perspective of Mobility, Development of Locomotion, Locomotion in the older adult, Abnormal Mobility, Abnormal Gait, disorders of mobility other than Gait, pathological gait, Running, Stair Climbing, Changes in gait following, various neurological disorders.

Unit-IV

PHARMACOLOGY

General Pharmacological Principles: Routes of Drug Administration, Pharmacokinetics, Pharmacodynamics, Adverse drug reactions and drug interactions. Systemic pharmacology: Drugs acting on Autonomic Nervous System, Drugs acting on Peripheral (Somatic) Nervous System, Drugs acting on Central Nervous System, Steroids, Muscle Relaxants, Drugs to reduce spasticity, Diuretics.

BOOKS RECOMMENDED:

1. Gray's Anatomy-Williams & Warwick- Churchill Livingston
2. Clinical Anatomy for Medical Students - Snell's- Lippincott.
3. Text Book of Medical Physiology- Guyton - Mosby.
4. Pharmacology and Pharmacotherapeutics, R. S. Satoskar - Popular Publications, Bombay.
5. Luttgens K., Hamilton N., Kinesiology: Scientific Basis of Human Motion 9th Edi, Brown & Benchmark.
6. Kapandji, the Physiology of the Joints, Vol. I, IL & Ill,W.B. Saunders.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy, and apply this information for understanding the mechanisms operating in neurological conditions resulting from injury or disease.
CO-2	Have sound knowledge of the anatomy of the nervous system in the body.
CO-3	Understand the relationship between structure and function of the nervous system of the healthy and diseased subjects.
CO-4	Develop ability to analyze mechanisms underlying selected neurological conditionsresulting from injury or disease processes.
CO-5	Understand the anatomy / applied anatomy basis for clinical testing of neurological structures.
CO-6	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy, and apply this information for understanding the mechanisms operating in neurological conditions resulting from injury or disease.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-I

MPN-1102: Physical and Functional Evaluation of Neurological Disorders

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M. Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To learn examination and assessment of Neurological conditions.
2. To learn various assessment tools used for evaluation and testing.
3. To learn various diagnostic invasive, non-invasive and radiological techniques for diagnosis of condition.

COURSE CONTENTS:

Unit-I

Importance of assessment & evaluation, Methods of evaluation — Interview, Clinical examination in general and detection of movement dysfunction, Clinical assessment and investigations along with differential diagnosis, Specific tests and scales related to neurological disorders, Neurological screening, Perception testing and training.

Unit-II

Motor control assessment, Reflexes and automatic reactions, voluntary control, Feedback mechanisms, Evaluation of motor system- MMT, Evaluating facial motor function in patients with peripheral and central lesions, Evaluating motor function in trunk and limbs of patients with a peripheral nerve lesion, Evaluating motor function in disorders of the central nervous system.

Evaluation of somatosensory sensation, Cognitive and perceptual evaluation, Assessment of cranial nerves, Aids and appliances, Adaptive functional devices to improve neurological

dysfunction, Physical disability evaluation and disability diagnosis, Assessment of higher functions.

Unit-III

Assessment of upper limb complex (In relation to neurological disorders): shoulder girdle, Shoulder, Arm, Elbow, Forearm, Wrist and hand. Assessment of lower limb complex (In relation to neurological disorders): Pelvis, Hip, Thigh, Knee, Leg, Ankle and foot. Assessment of spinal column: Cervical, Thoracic and lumbosacral.

Unit -IV

Assessment of balance and coordination: Gait analysis and diagnosis, Assessment of gait deviations.Neurodevelopment assessment and motor learning- voluntary control assessment, neuro- psychological tests, Neuro dynamic tests. (Slump, SLR, ULTT).
Electrodiagnosis- EMG, NCV, H-reflex, F-wave

Unit -V

Radiology: Basics of radiology including X- Ray, Doppler ultrasound, CT and MRI scanning, Biopsy report reading and analysis. Imaging of the Head and Neck, Imaging of Spine, Imaging of Pelvis, Hip and Thigh, Imaging of Patello Femoral Joint and Knee Joint, Imaging of the Lower leg, Foot and Ankle, Imaging of Shoulder girdle, Shoulder, and Arm. Imaging of Elbow, Forearm and Hand, Lumbar puncture, Imaging with dye.

BOOKS RECOMMENDED:

1. Geriant Fuller, Neurological Examination Made Easy, Churchill Livingstone.
2. David J. Magee, Orthopaedic Physical Assessment, W.B. Saunders Company.
3. M. Lacote, Clinical Evaluation of Muscle Function, Churchill Livingstone.
4. Susan Sullivan, Physical Rehabilitation, Jaypee Brothers
5. Sutton D, Text Book of Radiology, Churchill Livingstone.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know how to assess neurological conditions.
CO-2	Have complete knowledge about various assessment tools.
CO-3	Have complete knowledge of assessment done in various areas like sports and geriatrics
CO-4	Be well equipped with neurological assessment and to diagnose a condition successfully.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-I

MPN-1103: Clinicals/Journal Club-I

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to naïve entrants and as a college valued documents for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of the case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Get fully equipped with handling patients practically from the point of view of making provisional diagnosis and planning a physiotherapy treatment protocol.
CO-2	Develop skills on how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-II

MPT-1202: Skill Enhancing Studies

Credit Hours (Per week): 3
Total Hours: 42
M. Marks: 100
Time: 3 hrs **Theory: 75**
Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make students learn how healthcare system works.
2. To make students learn about management skills.
3. To make students know principles of private practice.
4. To give students knowledge about financial and risk management in healthcare set up.
5. To give students knowledge about marketing strategies in healthcare set up.
6. To give students knowledge about history and development, professional conduct and standards of practicing in physiotherapy.
7. To make students aware about codes of ethics, social and mental policies, professional liability and obligation, legal responsibilities and medico legal action in concerns with practicing as a physical therapist.
8. To make students learn about educational technology regarding types, philosophies, agencies; teaching and learning processes, theories of teaching, methods of teaching and other areas of program evaluation and assessment of education.

COURSE CONTENTS:

Unit-I: Management and Ethics in Physiotherapy

- Health care delivery system,
- Ownership and private practice in physiotherapy
- Organizing and engaging people in work setting
- Health care financial, planning and risk management
- Marketing and Information management
- History and Development, Professional conduct in Physiotherapy
- Standards of practice in Physiotherapy
- Morals and ethics
- Code of ethics, social and medical policy in health care
- Professional liability and obligation
- Legal responsibility and medico-legal action

Unit-II: Educational Technology

- Educational aims, trends and issues
- Formal and informal education
- Philosophies of education – Naturalism, professionalism, idealism, realism
- Contemporary and modern philosophies of education
- Agencies of education
- Relationship between teaching and learning
- Theories of teaching
- Motivational process of learning perception, individual differences, intelligence personality
- Planning of teaching, strategies of teaching, organization, writing lesson plan

- Teaching methods
- A-V aids
- Programme evaluation, cumulative evaluation
- Nature of measurement of education, meaning, process, personnel, standardized, non-standardized
- Standardized tools, important tests of intelligence, aptitude, personality, instrument, achievements and status scale.

BOOKS RECOMMENDED:

1. M. Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill Pbl.
2. Krishna Mohan and Meena Banerji, Communication Skills, Macmillan Pbl.
3. J M Synge, Riders to the Sea.
4. Bhushan Anand, Educational Technology, Bawa Publications, 2006.
5. Dr. Mangal S.K, Educational Technology, Tandon Publications, 2006
6. Sharma R.A, Essentials of E.T, Lyall Book Depot, 2004
7. Sharma R.A, Technology of teaching, Lyall Book Depot, 2004.
8. Elligworth, Educational Technology, Peerson, 2006.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Know howdoes a healthcare system work.
CO-2	Learn management skills and principles to work in healthcare set up
CO-3	Have complete understanding onfinancial and risk management and marketing strategies in the healthcare set up.
CO-4	Have complete knowledge about the professional conduct and standards of practicing in physiotherapy.
CO-5	Know about the codes of ethics, social and mental policies, professional liability and obligations, legal responsibility and medico-legal action required for working efficiently as a physiotherapist.
CO-6	Gain knowledge regarding the educations technology, its programming and evaluation along with its theories, tools and skills that will enhance their scope in teaching profession .

MASTER OF PHYSIOTHERAPY

(CARDIOPULMONARY, ORTHOPEDICS & NEUROLOGY) SEMESTER-II

MPT-1203: Exercise Physiology and Nutrition

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make students learn about basics of exercise, in form of energy sources, energy balance, regulation and replacement during exercise.
2. To give them know about physiological processes of exercise.
3. To understand the importance and adverse effects of exercise regulation.
4. To make them equipped with various types and stages of exercise training in variable scenarios.
5. To give them knowledge of how to relate exercise with our cardiovascular system when, why and how to implement it.
6. To make students understand that how human body respond to exercise from point of view of endocrine system.

COURSE CONTENTS:

- Energy sources- Carbohydrates, Proteins, Fats, Minerals and Vitamins. Metabolism of Carbohydrates, fats and proteins
- Energy balance, Regulation of calorie Intake and Ideal Body weight, Pre-competition meal, fluid and energy replacement in prolonged exercise.
- Obesity–Body composition and assessment, Various diets to reduce Obesity and other exercise regimes - ACSM guidelines

- Aerobic process- Intensity, duration of Exercises and Calculation of VO2 Max and its variability, How to estimate Aerobic Capacity
- Anaerobic process- Lactate Production, OBLA and Estimation of Anaerobic capacity, Oxygen Debt.
- Training Principles- Biological and Long term adaptations to training, Retraining recovery after exercise, Detraining, Overtraining
- Continuous training, Interval training, Endurance Training, Fartlek training, Plyometrics, Resistance training, Ballistic Stretching, Isokinetic training. Contraindications to physical training.
- Fatigue-Definition, types, causes and prevention. DOMS and its prevention. Deconditioning.
- Applied Work Physiology–MET, Classification of Exercise intensity based on MET. VO2 max. Blood lactate and other parameters, factors affecting sustained physical work. Assessment of workload in relation to work capacity.
- Basal metabolic and resting metabolic rates and factors affecting them.
- Classification of physical activities based on energy expenditure. Daily rates of average energy expenditure. Energy expenditure at rest and during various physical activities e.g. sleeping, sedentary work, household work, walking, jogging, running and swimming.
- Measurement of energy cost of exercise–direct calorimetry, indirect calorimetry, net oxygen cost of aerobic and anaerobic exercise, MET, body size and energy cost.
- Factors Affecting Performance- High Altitude- Physiological changes and adaptations in high altitudes, high altitude disorders. Deep sea diving and Breath hold diving, Physiological changes and adaptations in deep sea diving, SCUBA, Consequences of Deep sea diving- Nitrogen bends, Oxygen Poisoning, CO poisoning and Hyperbaric oxygen therapy, Doping- Ergogenic and Ergolytic IOC banned substances. Tobacco smoking - circulatory effects, respiratory effects, metabolic effects, smoking habits

among athletes. Caffeine, alcohol & Exercise.

- Cardiovascular system and exercise

  Athletes heart, cardiovascular adaptations to sustained aerobic exercises

  Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.

  Sudden cardiac death in sports

  Regulation of circulations during exercise

- Exercise and Respiratory system

  Athlete's lungs

  Regulation of respiration during exercise

- Endocrine system responses to exercise: effects of exercise on various hormones in the body, hormone regulation of fluid and electrolytes during exercise, exercise & menstrual cycle.

BOOKS RECOMMENDED:

1. William D. McArdle, Frank I.Katch, Victor L. Katch Exercise Physiology – Energy Nutrition and Human Performance Sixth Edition.
2. LippinCott Williams and Wilkins.
3. Exercise Physiology and Nutrition Jack H.Wilmore 3rd edition Churchill Livingstone.

COURSE OUTCOMES:

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand about exercise physiology and how to interpret it in making treatment protocols for their patients.
CO-2	Know about adverse effects of exercise regulation and how to treat it.
CO-3	Become trained as professionals to understand stages of exercise training and how to implement it.
CO-4	Have complete knowledge on how does exercise impact cardiovascular system and how body reacts through its endocrinological processes.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-II

MPN-1204: Medical and Surgical Aspects of Neurological Conditions

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To make student learn about various neurological disorders in detail how to access and diagnose them.
2. To make students learn about basic surgical procedures performs in field of neurology.

COURSE CONTENTS:

Unit-I

Stupor and Coma: The neural basis of consciousness, Lesions responsible ·for stupor and coma, Traumatic Brain Injury, Diffuse axonal Neuropathy, The assessment and investigation of the unconscious patient, The management of the unconscious patient, Total rehabilitation protocol; Cranial Nerves: Testing of cranial nerves, Disorders of cranial nerves, Cranial neuropathy, Rehabilitation protocol, Speech Disorders.

Unit-II

Disorders of Cerebral circulation: Epidemiology of stroke; Causes, Types, Pathophysiology, Clinical features and investigation, Treatment of different types of stroke, Recovery and rehabilitation, Stroke prevention, Infectious disorders: Meningitis, Encephalitis, Brain abscess,

Syphilis, Herpes simplex, Tuberculosis, Transverse myelitis, Poliomyelitis, LGBS, Tabes Dorsalis; Myasthenia Gravis, AIDS: Classification, Causes, Pathophysiology, Clinical features, Complications and management.

Unit-III

Demyelinating diseases of the nervous system: Classification of demyelinating diseases; Multiple sclerosis, Diffuse sclerosis, Motor Neuron Disorders, Extra Pyramidal Syndromes: Akinetic- rigidity syndrome disorders, Parkinson's disease, Dyskinesis disorders, Chorea, Athetosis, Hemiballismus etc., Cerebellar Disorders: Different types of Ataxia, Minere's disease

Unit-IV

Degenerative diseases of the spinal cord, Disorders/ Rehabilitation of the spinal cord and cauda equina: Acute traumatic injuries of the spinal cord, Haematomyelia and acute cervical cord injuries, Slow progressive compression of the- spinal cord, Syringomyelia, Ischaemia and infarction of the spinal cord and cauda equine, Disorders of higher cerebral cortical function: Disorders of different lobes-Frontal, Temporal, Parietal, Occipital, Sub cortical lesions, Cognitive and Perceptual Disorders and auto immune diseases.

Unit-V

Disorders of peripheral nerves: Clinical diagnosis of peripheral neuropathy, All types of peripheral neuropathies and brachial plexus lesions, Causalgia, Reflex sympathetic dystrophy, Peripheral nerve tumours, Irradiation neuropathy; Traumatic, Compressive and ischaemic neuropathy; spinal radiculitis and radiculopathy, Hereditary motor and sensory neuropathy, Acute idiopathic polyneuritis, Neuropathy due to infections, Vasculomotor neuropathy, Neuropathy due to Systemic Medical Disorders, Drug induced neuropathy, Metal poisoning, Chemical neuropathies and chronic fatigue syndrome.

Unit-VI

Disorders of muscles: Muscular dystrophies of adulthood,Themyotonicdisorders, Inflammatory disorders of muscle, Myasthenia gravis, Endocrine and metabolic myopathies,

Duchenne muscular dystrophy, Progressive muscular dystrophy

Unit-VII

Disorders of Autonomic nervous system: Disorders of autonomic function after lesions of spinal cord, Epilepsy, Geriatric neurological disorders, Metabolic disorders of brain: Hypoxic encephalopathy, Hypoglycaemic encephalopathy, Hepatic encephalopathy.

Unit-VIII

Falls in elderly, Age associated memory impairment, Alzeimers Disease, Dementia, Narcolepsy.

BOOKS RECOMMENDED:

1. Lord Walter Russell Brain, John Nichol, Walton, Brains Diseases of the Nervous System, Oxford University Press, 1993.

2. Cecily (ed.) Partridge, Neurological Physiotherapy: bases of evidence for practice: treatment and management of patients, Whurr Puhl, 2002

3. Simon J. Ellis, Clinical Neurology: Essential Concepts, Elsevier Health Sciences, 1998.
4. Richard Greenwood, Neurological Rehabilitation, Psychology Press, 1997.
5. Michael P. Barnes, Garth R. Johnson, Upper Motor Neuron Syndrome and Spasticity: Clinical Management and Neurophysiology, Cambridge University Press, 2001
6. Susan Edwards, Neurological Physiotherapy: A Problem-Solving Approach, , Elsevier Health Sciences, 2001.

COURSE OUTCOMES:

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand neurological disorders and the main surgical procedures performed for its management
CO-2	Access all the neurological conditions and have knowledge on the surgical procedures performed and also learn about when, why and how physiotherapy interventions are applied in the concerned scenario.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-II

MPN-1205: Clinicals/Journal Club-II

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to narrate entrants and as a college valueddocuments for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically from the point of view of making provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Learn skills about how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals and leave subject matter for new entrants and perform the role of mentors for their juniors

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-III

MPN-2306: Basic Physiotherapeutics for Neurological Disorder

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To extend students ability to select and apply physiotherapy management procedures
2. To develop skills to provide evidence-based treatment
3. To develop the ability to apply motor learning principles; select and develop programs that are goal directed; and maximize outcomes through optimal practice opportunities
4. To encourage the use of literature to evaluate various treatment approaches, strategies and modalities

COURSE CONTENTS:3

Unit-I
Rehabilitation and therapeutic exercises: Treatment planning process, Classification of treatment techniques based on Primary Input Systems, Psychosocial accommodation during various phases of Neurological Disability, Clinical management of the patient with a Mobility Disorder, Clinical management of the patient with a Postural Control Disorder.

Unit-II

Review of Basic Techniques: Stretching (principles and methods), Balance and coordination exercises. Factors affecting the joint range of motion prevention of stiffness, methods of Joint mobilization. Postural Re-education (methods and techniques)

Principle of therapeutic exercises: Definition, details of effects and uses of following exercises:
a. Dynamic Exercises
b. Plyometric Exercises
c. Isokinetic Exercises
e. Kinetic chain exercises
f. PRE

Therapeutic Biofeedback and psychosomatic training, Massage: Historical development, Definition and classification of massage techniques, Physiological effects of massage, Description of the techniques of the classical massage, Role of massage in various neurological disorders, Management of pain in neurological disorders.

Neuromuscular Training

i. Methods For Optimizing Neuromuscular & Postural Control : Proprioception Training And Kinesthetic Training (Sensory Integration),
ii. Problem Solving Approach,
iii. Motor Control
iv. Clinical Decision Making And Clinical Reasoning, Evidence Based Practice

Unit-III

Modalities: Principles underlying the application of following modalities with reference to their case study and case presentation, evidence base practice, biophysical and therapeutic effects, indications and contraindications and the specific uses, especially in various neurological disorders - Low Frequency Current (Direct Current, Modified Direct Current, Alternative Current, Diadynamic Current, Iontophoresis, TENS, Galvanic Stimulation),

Medium Frequency Current (IFT, Russian Currents). Laser therapy, Functional electrical stimulation, combination therapy and recent advancement in electrotherapy.Electrical stimulation and Electromyographic Biofeedback — Applications for neurological dysfunction

Unit-IV

Fluidotherapy: Physiological effects, Use of cold therapy in acute phase, Rehabilitative phase, and various neurological disorders, Methods of application, Indications and Contraindications.

History & introduction, Effects of simple baths, raising temperature baths, baths with additives, Aromatic baths, Mineral baths, physical baths, Hydroelectric baths, whirl pool bath, showers and steam showers.

Intermittent compression therapy: Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation of intermittent compression therapy. Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions.Extra corporeal shock wave therapy, light therapy and magneto-therapy.

Unit-V

I. **Principles of Orthotics**- types, indications, contra indications, assessment (check out), uses and fitting –region wise.
   i. Orthotics for the Upper Limb
   ii. Orthotics for the Lower Limb
   iii. Orthotics for the Spine

II. **Principles of prostheses**- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

BOOKS RECOMMENDED:

1. Low & Reed, Electrotherapy Explained: Principles & Practice, Butterworth Heineman
2. Basmajian, Therapeutic Exercises, Williams and Wilkins.
3. Cook & Wallcott, Motor Control: Theory and Practical Applications, Lippincott.
4. Kendall, Muscle testing and functions, Williams & Wilkins.
5. Trombley, Occupational therapy.
6. Voss et al, Proprioceptive Neuromuscular Facilitation, Williams and Wilkins.
7. William E. Prentice, Rehabilitation Techniques, Mosby.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Understand the core concepts used in different traditional approaches in the field of neuro-physiotherapy.
CO-2	Critique the existing knowledge of contemporary approaches used in different neurological conditions.
CO-3	Recommend assessment methods and intervention strategies based on different therapeutic models for neurological conditions.
CO-4	Evaluate the customized protocols for specific conditions based on traditional and contemporary approaches.
CO-5	Apply different outcome parameters in various neurological and neurosurgical conditions.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-III

MPN-2307: Neurosurgical Rehabilitation

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To develop skills in the use of clinical reasoning in order to plan the management of spinal cord injury patients and head & brain surgery patients.
2. Plan individualized physiotherapy goals for neurosurgical Conditions
3. Asses & plan management programme for critical care patients in I.C.U.
4. Provide emergency care with the multidisciplinary

COURSE CONTENTS:

Unit-I

Cranio-cerebral (head and brain) Surgery: Epidemiology, Pathophysiology, Symptoms, Signs, Investigations, Management, Post-operative physiotherapy, Complications of closed skull fractures, Haematomas-Epidural, Subdural, Intracerebral, Open cranio-cerebral injuries, Reconstruction operation in head injuries, Introduction to neurological ICU.

Unit-II

Tumours: Pathophysiology, Classification, Effects of mass lesion, Symptoms and signs, Examination, Management, Pre and post-operative rehabilitation protocol of tumours of cranial bones, Meningioma, Tumours in spinal cord, Intracranial tumours, and peripheral tumours.

Unit-III

Other conditions related to raised intracranial pressure: Hydrocephalus, Intracranial abscess, Central oedema, Vascular diseases of the brain: Aneurysms.

Surgeries in Cerebral palsy.

Unit-IV

1. Introduction to spinal Injuries- various types, levels, effects.

    - Acute lesion characteristics. type and level
    - Respiratory therapy
    - Initial physical re education
    - Training for personal independence, self care, transfers
    - Wheelchair- principles for design, types, management and modifications.
    - Complications of high lesion and Incomplete spinal lesions
    - Orthotic support systems
2. Decompression surgeries of Spinal cord: Disc operation (cervical, lumbar), Stenosis, Oedema, Abscess, Lumbar puncture,

3. Peripheral nerves: Decompression, Nerve suture, Nerve grafting, Tendon transfers.

Unit-V

I. An outline of principles and methods of rehabilitation of speech and hearing disability
II. An outline of principles and methods of vocational and social rehabilitation
III. An outline of principles and methods of rehabilitation of mentally handicapped
IV. An outline of principles , methods and scope occupational therapy
V. Architectural Barriers: Describe architectural barriers and possible modifications with reference to, CVA, Spinal Cord Injury and other disabling conditions.
VI. An outline of the principles and process of disability evaluation and Legal Aspect in Disabilities
VII. WCPT Guidelines for rehabilitation

BOOKS RECOMMENDED:

1. Kenneth W. Lindsay, Ian Bone, Neurology and Neurosurgery Illustrated, Churchill Livingstone, 2004.

2. Michael E. Selzer, Textbook of Neural Repair and Rehabilitation: Medical Neurorehabilitation, Cambridge University Press, 2006.

3. Andrew Kaye, Essential Neurosurgery (Essential), Blackwell Publishers, 2005.

4. Brian T. Ahdrews, Intensive Care in Neurosurgery, Thieme, 2003.

5. Willem Adriaan Liebenberg, Reuben David Johnson, Neurosurgery for Basic Surgical Trainees, Hippocrates Books, 2004.

6. Danilo Jankovic, Regional Nerve Blocks: Textbook and Color Atlas - Page 3, Blackwell Publishing, 2001.
7. Walter G. Bradley, Robert M. Crowell; The Year Book Of Neurology and Neurosurgery, Chicago • Year Book Medical Publishers, 2006.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Learn the evaluation of patients pertaining to signs and symptoms for specific neurological conditions. e g. traumatic brain injury.
CO-2	Plan a rehabilitation protocol, implication of it effectively and understand the steps and duration of progression of the neuro-rehabilitation protocols.
CO-3	Develop professional relationship and provide emergency care in co-operation with multi-disciplinary team
CO-4	Expertise the orthotic support system.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-III

MPN-2308: Dissertation-I

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To make students prepare for clearance of research proposal
2. To make students complete the data collection by the end of this semester

COURSE CONTENTS:

1. The students have to prepare a research proposal of the research project to be undertaken.
2. Students have to submit the soft and hard copy of the research proposal.
3. Power point presentation of the research proposal for the ethical committee clearance.
4. Students have to complete the data collection by the end of this semester.
5. Power point presentation of the research work completed till the end of this semester.

COURSE OUTCOMES (CO):
On completion of the subject, students will have had the opportunity to develop the followingskills:

CO-1	Develop ability to conduct research independently
CO-2	Demonstrate a commitment to disseminate their knowledge through publications and presentations
CO-3	Understand the method of data collection and analysis of collected data using suitable statistical tests

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-III

MPN-2309: Practical

Credit Hours (Per week): 4
Total Hours: 56
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To synthesize the entire theoretical knowledge into actual clinical situations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation covered till this semester.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients
CO-2	Do self assessment of their personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve the profession and community

MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER-III

MPN-2310: Clinicals/Journal Club – III

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to naïve entrants and as a college valued documents for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two case studies and two research studies in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the semester in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically from the point of view of making provisional diagnosis and planning a physiotherapy treatment protocol.
CO-2	Develop skills to present case studies, scientific papers in journals and in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals by leaving matter regarding their experience which will prove to be useful for their juniors.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-IV

MPN-2411: Neurological Rehabilitation

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To formulate a rationalized treatment plan for the patient
2. Implement physiotherapy treatment
3. Compare & contrast the outcome of various treatment approaches
4. Document the status to the patient as written records

COURSE CONTENTS:

Unit-I

Principles, techniques of application and protocol for following special techniques:
Motor control therapy, Modified CIMT, myofascial release, cranio-sacral therapy, MIME therapy,
Mc Kenzie exercises, taping for neurological disorders, relaxation techniques.

Neuropsychological and developmental Treatment Approaches - (Rood Approach, Bobath Neurodevelopmental Approach, Brunnstrom's Approach, PNF Approach, Carr and Shepherd Approach). Task oriented approach

Inhibition and facilitation techniques, Muscle Energy Techniques (MET), Therapeutic psychosomatic training, Nerve mobilization, Butler, NDT, Vojta techniques.

Unit-II

Neuromuscular control- methods for improving neuromuscular control, Vestibular rehabilitation, aquatic therapy, Gait rehabilitation, Yoga, Soft tissue manipulation, Neurodynamics, ADL training, Wheel chair activities, Bed mobility.

Pilates, Virtual reality, Mirror therapy, Trans-cranial electric and magnetic stimulation, and Peripheral magnetic stimulation.

Unit-III

Rehabilitation of: Disorders of cranial nerves, cerebral circulation, infectious disorders, autoimmune disorders, demyelinating diseases of nervous system, motor neuron disorders, extra pyramidal lesions, cognitive and perceptual disorders, and cerebellar disorders.

Unit-IV

Degenerative diseases of spinal cord, disorders of higher cerebral cortical function, various peripheral neuropathies, chronic fatigue syndrome, disorders of muscles, disorders of Autonomic nervous system, metabolic disorders of brain, geriatric neurological disorders, and various psychological disorders.

BOOKS RECOMMENDED:

1. Cook & Wallcott, Motor Control: Theory and Practical Applications Shumway, Lippincott.
2. Carr J, Shepherd R, Neurological Rehabilitation - optimizing motor performance, Butterworth Heinemann, Oxford, 1998.
3. Voss et al, Proprioceptive Neuromuscular Facilitation, Williams and Wilkins.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Get expertise in various special techniques such as PNF, modified CIMT, MFR, MIME therapy and many more
CO-2	Incorporate various methods of improving neuromuscular control in managing the neurological patients.

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-IV

MPN-2412: Physiotherapy in Pediatric Neurology

Credit Hours (Per week): Theory: 4, Practical: 4
Total Hours: (Theory: 56, Practical: 56)
M: Marks: 200
Time: 3 hrs **Theory: 75, Practical: 75**
Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:
Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.
Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.
Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. Student will be able to understand the functional limitations seen in paediatric patients having neurological disorders.
2. Student will be able to incorporate the knowledge of various physiotherapeutic approaches and adjunct treatment methods used in managing the paediatric neurological conditions.
3. The course should enable the student to acquire in-depth knowledge and skill in assessment and physiotherapy management of different disorders affecting nervous systems in children.

COURSE CONTENTS:

Unit-I

General developmental sequence of normal child: Weight, height and circumferential measurements related to age in normal child & Developmental milestones and neonatal reflexes. Examination of neonate. High risk Infants risk factors, assessment, ICU, PICU and NICU Care and early intervention programmes.

Unit-II

Nutrition and Immunization: Normal nutritional requirements of a child, Infant feeding, prevention of some nutritional disorders, nutritional deficiency diseases, immunization.

Unit-III

Cerebral palsy: Types, etiology, clinical features, management and rehabilitation of various types of cerebral palsies.

Unit-IV

Neurological affection of childhood: Poliomyelitis, Spina bifida, Hydrocephalus, Encephalitis-etiology, clinical features and rehabilitation. Birth injuries of brachial plexus, paraplegia in children.

Unit-V

Muscular disorders: Types of muscular dystrophies and Myopathies of childhood, DMD, BMD etc.

Unit-VI

Motor control and Motor learning: Theories of Motor control and Motor learning, role of limbic system and Its Influence over Motor control and learning. Sensory Integration therapy. Behavioral therapy.

Unit-VII

Genetic disorders, congenital malformations, chromosomal disorders and learning disabilities relevant to specialty.

BOOKS RECOMMENDED:

1. Piper Motor Assessment of the Developing Infant
2. Ratliffe Clinical Pediatric Physical Therapy, 2e
3. Shepherd Physiotherapy In Pediatrics, 3e

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Demonstrate adequate knowledge and skill in physiotherapy assessment and management of different disorders affecting nervous system in children

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-IV

MPN-2413: Dissertation-II

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1. Ability to conduct research independently
2. To make students complete the data collection by the end of this semester
3. Interpretation of data and presentation of complete research work

COURSE CONTENTS:

1. The candidate shall prepare 4 hard and 3 soft (CDs) copies of the dissertation and submit the same to the department office on or before the last working day of this semester.

2. Power point presentation of the complete research work.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Develop ability to conduct research independently.
CO-2	Demonstrate a commitment to disseminate their knowledge through publications and presentations.
CO-3	Understand the method of data collection and analysis of collected data using suitable statistical tests.
CO-4	Find new correlation between variables or may find a suitable advance therapeutic intervention for different conditions

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-IV

MPN-2414: Practical

Credit Hours (Per week): 12
Total Hours: 126
M. Marks: 200
Practical: 150
Internal Assessment: 50

COURSE OBJECTIVES:

1. To synthesize the entire theoretical knowledge into actual clinicalsituations

COURSE CONTENTS:

The students will be undergoing a viva-voce related to the entire semester subjects and dissertation.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients
CO-2	Do self assessment of personal and professional strengths and weaknesses
CO-3	Plan and execute activities to serve the profession and community

MASTER OF PHYSIOTHERAPY (NEUROLOGY) SEMESTER-IV

MPN-2415: Clinicals/Journal Club – IV

Credit Hours (Per week): 22
Total Hours: 300
M. Marks: 100
Practical: 75
Internal Assessment: 25

COURSE OBJECTIVES:

1. To give students practical exposure of hospital set up.
2. To make students observe practically how physiotherapy works in multispecialty. Hospital.
3. Students will be taught how to make their own case studies, scientific papers, journals and present them in front of experts for feedback.
4. To keep record of the work done by the students to naïve entrants and as a college valued documents for further recognitions.

COURSE CONTENTS:

Section I: Case Presentation

The students will have to present at least two mandatory case studies and two journals in power point presentation form.

Section II: Clinical Posting

The students will have to visit various hospitals of Amritsar for their clinical postings scheduled by the department. The students must maintain a continuous record of case studies assessed by them during the session in a logbook.

COURSE OUTCOMES (CO):

On completion of the subject, students will have had the opportunity to develop the following skills:

CO-1	Become fully equipped with handling patients practically in viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.
CO-2	Have skills about how to present case studies, scientific papers and journals in front of experts in the field.
CO-3	Leave their valuable work done during their postings in hospitals and leave subject matter for new entrants as they work as mentors for their juniors.

BOOKS RECOMMENDED:

1. Gray's Anatomy-Williams & Warwick- Churchill Livingston
2. Clinical Anatomy for Medical Students - Snell's- Lippincott.
3. Text Book of Medical Physiology- Guyton - Mosby.
4. Pathologic Basis of Diseases - Robbins , Kotran and Kumar- W.B. Saunders
5. Rau Respiratory Care Pharmacology, 6e
6. Pharmacology and Pharmacotherapeutics,_R.S.Satoskar - Popular Publications, Bombay.
7. Pharmacology - Praseem K. Oas. - Churchill Livingstone.
8. Essential of Medical Pharmacology- K. D. Tripathi- Jaypee Brothers.
9. General Pathology - Walter & Israel - Churchill Livingstone
10. Muirs Textbook of Pathology; Anderson - Edward Arnold Ltd.
11. Textbook of Pathology - Harsh Mohan- Jaypee Brothers.
12. Pathology: Implications for Physical Therapists - Goodmann and Boissonnault - W.E. Saunders
13. Essential of Medical Microbiology -Bhatia & Lal - Jaypee Brothers.
14. Microbiology & introduction for the Health Sciences - Ackerman and Richarc::ls - W.B. Saunders Co.
15. Text Book of Medical Biochemistry- MN Chatterjea- Rana Shinde- Jaypee
16. John Low & Reed: Electro therapy Explained ,Butterworth
17. Joseph Kahn: Principles and practice of Electrotherapy, Churchill Livingstone.
18. Claytons Electrotherapy 10th Ed. - Sarah & Bazin -W.B. Saunders.
19. TB of Therapeutic Exercises, Narayanan, Jaypee
20. Therapeutic Exercise, Basmajian, Williams & Wilkins
21. Therapeutic Exercise Foundation & Techniques, Kisner Colby, Jaypee.
22. A.G. Sinha, Principle and Practices of therapeutic Massage. Jaypee
23. Orthotics and Prosthetics In Rehabilitation, 2e Lusardi, Elsevier.
24. Orthotics In Functional Rehabilitation of the Lower Limb Nawoczenski, Elseivier
25. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi.
26. Wood & Baker: Beard's Massage, W.B. Saunders.
27. Kendall: Muscles -Testing and Function -Williams & Wilkins
28. Daniels and Worthinghams: Muscle Testing -Techniques of Manual

29. Examination, W.B. Saunders.

30. First Aid to Injured: St. John's Ambulance Association.

31. Norkin & White: Measurement of Joint Motion - A Guide to Goniometry

32. Luttgens K., Hamilton N.: Kinesiology- S ientific Basis of Human Motion, 1997, Brown & Benchmark.

33. White and Punjabi - Biomechanics of Spine - Lippincott.

34. Basmajian - Muscle alive -Williams & Wilkins

35. Muscle Energy Technique, Leon chaitow ,Churchill Livingstone.

36. Butler Neural mobilization , Butler

37. Campbell Rehabilitation for Traumatic Brain Injury: Physical Therapy Practice In Context

38. Carr Stroke Rehabilitation: Guidelines for Exercise and training to Optimize

39. Carr Neurological Rehabilitation: Optimizing Motor Performance, 2e

40. Cech Functional Movement Development Across the Life Span, 2e

41. Campbell Physical Therapy for Children, 3e

42. Edwards Neurological Physiotherapy: A Problem-Solving Approach, 2e

43. Lundy·Ekman Neuroscience: Fundamentals for Rehabilitation, 2e

44. Martin Neurologic Interventions for Physical Therapy, 2e

45. Petty Neuromusculoskeletal Examination and Assessment: A Handbook for Therapists, 3e

46. Piper Motor Assessment of the Developing Infant

47. Pope Severe and Complex Neurological Disability: Management of the Physica I Condition

48. Ratliffe Clinical Pediatric Physical Therapy, 2e

49. Shacklock Clinical Neurodynamics: A New System of Neuromusculoskeletal Treatment

50. Shepherd Physiotherapy In Pediatrics, 3e

51. Stokes Physical Management in Neurological Rehabilitation, 2e

52. Umphred Neurological Rehabilitation, Se

53. Von Craniofacial Pain: Neuromusculoskeletal Assessment, Treatment and Management

54. Dejong's, Neurological Examination

55. 0.Sullivan, Susan B Physical rehabilitation: Assessment and Treatment, FA Davis Company

56. Berta bobath, Adult Hemiplegia: Evaluation & Treatment

57. Delisa, Physical Medicine and Rehabilitation. Walter R. Frontera

58. Brunnstrom's Movement Therapy in Hemiplegia: A Neurophysiological Approach . Kathryn A. Sawner

59. Clinical Neuroanatomy Richard S. Snell

60. Basic Biomechanics of the Musculoskeletal System by Margareta Nordin, Victor H. Frankel.

61. Occupational Therapy for Physical Dysfunction 7th Edition by Mary Vining Radomski, Catherine A. Trombly

62. Braddom's Physical Medicine and Rehabilitation, 5e by David X. Cifu

63. Pilates Anatomy by Rael Isacowitz and Karen Clippinger.

64. A Practical Guide to Kinesiology Taping. John Gibbons.