

MOHAN BABU UNIVERSITY

Sree Sainath Nagar, Tirupati – 517 102



MBU
MOHAN BABU
UNIVERSITY

DREAM. BELIEVE. ACHIEVE

SCHOOL OF PARAMEDICAL, ALLIED AND HEALTH CARE SCIENCES

Master of Physiotherapy-Cardiovascular and Pulmonary

CURRICULUM AND SYLLABUS
(From 2022-23 Admitted Batches)

FULLY FLEXIBLE CHOICE BASED CREDIT SYSTEM(FFCBCS)



MOHAN BABU UNIVERSITY

Vision

To be a globally respected institution with an innovative and entrepreneurial culture that offers transformative education to advance sustainability and societal good.

Mission

- ❖ Develop industry-focused professionals with a global perspective.
- ❖ Offer academic programs that provide transformative learning experience founded on the spirit of curiosity, innovation, and integrity.
- ❖ Create confluence of research, innovation, and ideation to bring about sustainable and socially relevant enterprises.
- ❖ Uphold high standards of professional ethics leading to harmonious relationship with environment and society.

SCHOOL OF PARAMEDICAL, ALLIED AND HEALTH CARE SCIENCES

Vision

To be the global center of excellence for paramedical and allied health science education, research, innovation, incubation, consultancy and public service.

Mission

- ❖ Inspire the experts of paramedical and allied health sciences of tomorrow to take on the public health challenges of our society.
- ❖ Train the students with fundamental knowledge of paramedical and allied health sciences, skills set and positive attitude for creating innovative solutions to serve industry and community through congenial learning environment with contemporary academic programs, state of the art infrastructure facilities and community health programs.
- ❖ Facilitate budding paramedical and allied health science experts with the best research-innovation-incubation-start-up ecosystem to realize their fullest potential for sustainable businesses.
- ❖ Encourage faculty and staff to excel in their respective domains of expertise and demonstrate the best of their abilities by way of continuing education, research support and consultancy.

Master of Physiotherapy – Cardiovascular and Pulmonary

PROGRAM EDUCATIONAL OBJECTIVES

After few years of graduation, the graduates of MPT will:

- PEO1.** Evolve as an entrepreneur or be employed in physiotherapy practice.
- PEO2.** Pursued research studies in the field of physiotherapy and allied areas.
- PEO3.** Continued to learn and to adapt evolving concepts and technologies in the core or allied Physiotherapy.

PROGRAM OUTCOMES

On successful completion of the Program, the graduates of MPT Program will be able to:

- PO1. Knowledge:** Apply evidence-based concepts of physiotherapy and its therapeutic procedures.
- PO2. Analysis:** Analyze, evaluate and diagnose various problems using research-based knowledge and research methods in Physiotherapy practice.
- PO3. Tools & Techniques:** Identify appropriate strategies and rehabilitative approaches to restore normal activities of daily living.
- PO4. Ethics and Society:** Apply the ethical principles of health care practices for sustainable development of society
- PO5. Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and multidisciplinary settings.
- PO6. Effective Communication:** Communicate effectively on Paramedical & allied Health care activities with the treating patient, community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO7. Project and Finance Management:** Demonstrate knowledge and understanding the management principles and apply these to one's own work to manage projects in multidisciplinary health care system.
- PO8. Life-long learning:** Adapt to the changes and advancements in technology and engage in independent and lifelong learning

PROGRAM SPECIFIC OUTCOMES

On successful completion of the Program, the graduates of MPT-Cardiovascular and Pulmonary program will be able to:

- PSO1.** Analyze and apply appropriate Orthopedic treatment plan with clinical reasoning.
- PSO2.** Analyze the problem and advice suitable ergonomics for corrections of postures.
- PSO3.** Demonstrate appropriate exercises for health and physical fitness.

Master of Physiotherapy - Cardiovascular and Pulmonary

Basket Wise - Credit Distribution

S. No.	Basket	Credits (Min. - Max.)
1	SCHOOL CORE	48-50
2	PROGRAM CORE	29-32
3	PROGRAM ELECTIVE	20-26
4	UNIVERSITY ELECTIVE	3-6
TOTAL CREDITS		Min. 100

SCHOOL CORE (48-50 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project Based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT201001	Research Methodology for Biostatistics	4	-	-	-	4	-
22EE201002	Innovation and Intellectual Property Rights	2	-	-	-	2	-
22PT211001	Clinical Training-I	-	-	-	-	6	-
22PT211002	Clinical Training-II	-	-	-	-	6	-
22PT211003	Clinical Training-III	-	-	-	-	8	-
22PT211004	Clinical Training-IV	-	-	-	-	8	-
22PT211005	Literature Review and Teaching -I	-	-	-	-	1	-
22PT211006	Literature Review and Teaching -II	-	-	-	-	1	Literature Review and Teaching -I
22PT211007	Literature Review and Teaching -III	-	-	-	-	1	Literature Review and Teaching -II
22PT211008	Literature Review and Teaching -IV	-	-	-	-	1	Literature Review and Teaching -III
22AB211001	Community Camp I	-	-	-	-	1	-
22AB211002	Community Camp II	-	-	-	-	1	Community Camp I
22PT211009	Dissertation	-	-	-	-	10	-
22PT201007	Research Methodology and Biostatistics	4	-	-	-	4	-
Mandatory Courses (Min. 4 Credits to be earned, Earned Credits will not be considered for CGPA)							
22MG207601	Project Management	2	-	-	-	2	-
22MG207602	Essentials of Business Etiquettes	2	-	-	-	2	-
22CE201701	Disaster Management	3	-	-	-	3	-
22CM207601	Essential of Leadership	2	-	-	-	2	-

Note: Clinical Training-I & II - 3 Hours/day; Clinical Training-III & IV -5 Hours/day;

PROGRAM CORE (29-32Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project Based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT201002	Principles of Physiotherapy Practice	2	-	-	-	2	-
22PT202001	Exercise Physiology and Nutrition	4	-	2	-	5	-
22PT202002	Clinical Electrophysiology	5	-	2	-	6	-
22PT202003	Clinical Biomechanics and Kinesiology	4		2	-	5	-
22PT202004	Advanced Physiotherapeutic-I	3	-	2	-	4	-
22PT202005	Advanced Physiotherapeutic-II	2	-	2	-	3	-
22PT202006	Physiotherapy Diagnosis and Clinical Decision Making	3	-	2	-	4	
22PT201003	Sports for Fitness, Prosthetics and Orthotics	4	-	-	-	4	-

PROGRAM ELECTIVE (20-26 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project Based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT202013	Cardiovascular and Pulmonary Basic Science	4	-	2	-	5	-
22PT202014	Cardiovascular, Pulmonary Assessment and Evaluation	4	-	2	-	5	-
22PT201010	Clinical Cardiovascular and Pulmonary	5	-	-	-	5	Cardiovascular, Pulmonary Assessment and Evaluation -
22PT202015	Cardiovascular and Pulmonary Physiotherapy Interventions	4	-	2	-	5	-
22PT201009	Cardiovascular and Pulmonary Rehabilitation	4	-	-	-	4	Cardiovascular and Pulmonary Physiotherapy Interventions
22PT201011	Recent Advances in Cardiovascular and Pulmonary Physiotherapy	2	-	-	-	2	-

UNIVERSITY ELECTIVE (3-6 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22CB101703	Forensic Science	3	-	-	-	3	-
22EC101701	AI in Healthcare	3	-	-	-	3	-
22SS201701	Value Education	3	-	-	-	3	-
22SS201702	Pedagogy Studies	3	-	-	-	3	-
22LG201701	Personality Development	3	-	-	-	3	-

Note:

1. If any student has chosen a course or equivalent course from the above list in their regular curriculum then, he/she is not eligible to opt the same course/s under University Elective.
2. The student can choose courses from other disciplines offered across the schools of MBU satisfying the pre-requisite other than the above list.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT201001	RESEARCH METHODOLOGY FOR BIOSTATISTICS	4	-	-	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: The course is developed for the students to understand the underlying concepts of research methodology and a systematic approach for carrying out research in the domain of interest. The course is emphasised on developing skills to recognise and reflect the strength and limitation of different types of research; data collection methods, methods of Processing and analysing data. The course also emphasises on interpreting the findings and research articulating skills.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the underlying concepts of research methodology, types of research and the systematic research process and philosophy of research design.
- CO2.** Demonstrate the philosophy of formulation of research problem, methods of data collection, review of literature and formulation of working hypothesis.
- CO3.** Demonstrate the philosophy of biostatistics and its relevance to research methodology for carrying research in the domain.
- CO4.** Analyze various data processing & techniques and their significance in research.
- CO5.** Develop skills to interpret the findings and research articulating skills along with the ethics of research.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	-	-
CO2	3	2	1	-	-	-	-	-	3	-	-
CO3	3	1	-	-	-	-	-	-	3	-	-
CO4	3	3	2	-	-	-	-	-	3	-	-
CO5	3	2	1	-	-	3	-	1	3	-	-
Course Correlation Level	3	2	2	-	-	3	-	1	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO RESEARCH METHODOLOGY (10 Periods)

Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research and Scientific Method, Research Process, Criteria of Good Research. Research design—Basic Principles, Need of research design, Features of good design, Basic principles of experimental designs,

Module 2: RESEARCH PROBLEM FORMULATION (10 Periods)

Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem – Data collection – Primary and secondary sources; Critical literature review – Identifying gap areas from literature review, Development of working hypothesis.

Module 3: INTRODUCTION TO BIOSTATISTICS (12 Periods)

Meaning, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

Module 4: STATISTICAL ANALYSIS OF DATA (18 periods)

Need for measures of central Tendency: mean, median and mode, Guidelines for the use of various measures of central tendency, Standard deviation; Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors; Correlation and Regression; Analysis of variance (ANOVA):Basic principle of ANOVA, ANOVA technique; Normal distribution.

Module 5: INTERPRETATION AND REPORT WRITING (10 Periods)

Interpretation: Meaning of interpretation; Techniques of interpretation; Precautions in Interpretation.

Report Writing:

Significance, Different Steps, Layout, Types of reports, Mechanics of Writing a Scientific Research Reports and journals, Precautions in Writing Reports-Plagiarism, Critics in the research.

Total Periods: 60

EXPERIENTIAL LEARNING

1. Conduct a survey based on a hypothesis, analyze the data collected and draw the inferences from the data.
2. Review the literature on the given topic and should identify the scope/gaps in the literature and develop a research hypothesis.
3. Study a case, formulate the hypothesis and identify an appropriate testing technique for the hypothesis.
4. Study an article and submit a report on the inferences and should interpret the findings of the article.

Master of Physiotherapy- Cardiovascular and Pulmonary

BOOKS:

1. C.R. Kothari, *Research Methodology: Methods and Techniques*, New Age International Publishers, 2nd revised edition, New Delhi, 2004.
2. Mahajan: *methods in biostatistics for medical students & research workers*. Jaypee Brothers Medical Publishers; 9th edition (28th February 2018)
3. R. Panneerselvam, *Research Methodology*, PHI learning Pvt. Ltd., 2009.
4. Carolyn M. Hicks: *Research methodology for clinical therapist*. Churchill Livingstone; 5th edition (7th August 2009)

VIDEO LECTURES:

1. <https://nptel.ac.in/courses/121106007>
2. https://onlinecourses.nptel.ac.in/noc22_ge08/preview
3. <https://www.youtube.com/watch?v=VK-rnA3-41c>

Web Resources:

1. <https://www.scribbr.com/category/methodology/>
2. <https://leverageedu.com/blog/research-design/>
3. <https://prothesiswriter.com/blog/how-to-formulate-research-problem>
4. <https://www.formpl.us/blog/hypothesis-testing>
5. <https://www.datapine.com/blog/data-interpretation-methods-benefits-problems/>
6. <https://leverageedu.com/blog/report-writing/>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22EE201002	INNOVATION AND INTELLECTUAL PROPERTY RIGHTS	2	-	-	-	2
Pre-Requisite	--					
Anti-Requisite	--					
Co-Requisite	--					

COURSE DESCRIPTION:

The course is designed to provide comprehensive knowledge to the students regarding the general principles of innovation and intellectual property rights, significance of innovation and steps for innovation, Concept and Theories, Criticisms of Intellectual Property Rights, International Regime Relating to IPR. The course provides an awareness on how to protect ones unique creation, claim ownership, knowledge of what falls under the purview of someone’s rights and what doesn’t, and safeguard their creations and gain a competitive edge over the peers.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Understand the significance of innovation and steps for innovative thinking, and the concepts of intellectual property right and avenues for filling intellectual property rights.
- CO2.** Understand the legislative practices and protocols for acquisition of trademark and the judicial consequences for violating laws of trademark protection.
- CO3.** Understand the legislative practices and protocols for acquisition of copyrights and the judicial consequences for violating laws of copyrights protection.
- CO4.** Understand the fundamentals of patent laws, legislative practices and protocols for acquisition of trade secrets and the judicial consequences for violating laws of trade secrets protection.
- CO5.** Understand the latest developments and amendments in protection and filling of intellectual rights at international level.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	3
CO2	-	-	-	-	-	3
CO3	-	-	-	-	-	3
CO4	-	-	-	-	-	3
CO5	-	-	-	-	-	3
Course Correlation Mapping	-	-	-	-	-	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction to Innovation and IPR (06 Periods)

Innovation: Difference between Creativity and Innovation – Examples of innovation; Being innovative; Identify Blocks for creativity and innovation – overcoming obstacles; Steps for Innovation

Intellectual property rights: Need for intellectual property rights (IPR); types of intellectual property- Design, Geographical Indication; International organizations, agencies and treaties.

Module 2: Trademarks (06 Periods)

Introduction to trademark, Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

Module 3: Law of Copyrights (06 Periods)

Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer.

Module 4: Trade Secrets (06 Periods)

Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair competition: Misappropriation right of publicity, false advertising.

Module 5: New Development of Intellectual Property (06 Periods)

New developments in: trade mark law, copy right law, patent law, intellectual property audits. International overview on intellectual property; international - trade mark law, copy right law, international patent law, international development in trade secrets law.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Should conduct a survey based on the real scenario, where IPR is misused or unethically used and present an article.
2. Prepare an article on the registration processes of IPR practically (copy right/trade mark/ patents).

3. Should study a case of conflict on trademarks/patents and should produce an article mentioning the circumstances and remedial measures.
4. Prepare an article on the latest development in the international intellectual property rights.
5. Refining the project, based on the review report and uploading the text

RESOURCES

TEXT BOOKS:

1. Deborah, E. Bouchoux, *Intellectual property: The law of Trademarks, Copyright, Patents, and Trade Secrets*, Cengage learning, 4th Edition, 2013.
2. Prabuddha Ganguli, *Intellectual property right - Unleashing the knowledge economy*, McGraw Hill Education, 1st Edition, 2017.
3. Tom Kelley & Jonathan Littman, *The Art of Innovation*, Profile Books Ltd, UK, 2008

REFERENCE BOOKS:

1. Neeraj P., & Khusdeep D, *Intellectual Property Rights*, PHI learning Private Limited, 1st Edition, 2019.
2. Nithyananda, K V. *Intellectual Property Rights: Protection and Management*, Cengage Learning India Private Limited, 2019
3. Edward debone, *How to have Creative Ideas*, Vermilon publication, UK, 2007.

VIDEO LECTURES:

1. <https://nptel.ac.in/courses/110105139>
2. <https://www.youtube.com/watch?v=bEusrD8g-dM>
3. <https://www.youtube.com/watch?v=LS7TTb23nzU>

Web Resources:

1. <http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf>
2. https://www.wipo.int/edocs/pubdocs/en/intproperty/489/wipo_pub_489.pdf
3. <http://cipam.gov.in/>
4. <https://www.wipo.int/about-ip/en/>
5. <http://www.ipindia.nic.in/>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201002	PRINCIPLES OF PHYSIOTHERAPY PRACTICE	2	-	-	-	2
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on physiotherapy principles, legal issues, and evidence-based physiotherapy practice.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate ethical, legal, rules and regulations of statutory bodies in physiotherapy practices.
- CO2.** Demonstrate the managerial skills and opportunities available at various sectors in physiotherapy practice.
- CO3.** Analyse and interpret various tests and scales in physiotherapy practices
- CO4.** Apply appropriate tests to assess the condition of the patient and recommend suitable treatment by following ICF standards.
- CO5.** Demonstrate the teaching, learning and counselling skills in physiotherapy education

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	2	-	-	3	-	-	1	1	3	-	-
CO2	3	-	-	-	-	2	3	-	3	-	-
CO3	3	3	2	-	-	-	-	-	3	-	-
CO4	3	2	3	1	-	1	-	-	3	-	-
CO5	3	-	2	-	-	3	-	-	3	-	-
Course Correlation Mapping	3	3	2	2	-	2	2	1	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction to Physiotherapy Ethics & Legal issues (04 Periods)

Development of Physiotherapy Profession, Legal aspects in Physiotherapy Practice, Ethical issues in Practice of Physiotherapy– Clinical, Research & Academics. Administration, Legislation, Rules & Regulations governing Physiotherapy Practice. Future challenges in Physiotherapy.

Module 2: Standards and scope of Physiotherapy (07 Periods)

Scope of Physiotherapy in Hospital, Community & Industry. Planning, organization, budget, policy procedures and quality assurance. Communication skills, leadership in Physiotherapy. Roles of the physiotherapist. Standards for practice for physiotherapist and the criteria. Standardized tests and scales used in various types of cases for assessment and interpretation in Physiotherapy practice.

Module 3: Principles of Assessment, Management & Documentation (07 Periods)

History taking, assessment, tests, Patient communication, documentation of findings, treatment organization and planning/execution for intervention. Documentation of rehabilitation assessment and management using International Classification of Functioning Disability and Health(ICF).

Module 4: Concepts of Teaching & Learning in Physiotherapy Education (07 Periods)

Concepts of teaching and learning a) Theories of teaching b) relationship between Teaching and learning c) psychology of education d) Motivational process of learning perception, individual differences, intelligence, personality.

Module 5: Principles of Guidance & Counselling & Methods of Teaching (05 Periods)

Guidance and counseling Principles and concepts, guidance and counseling services of students and faculty. Mentorship in Physiotherapy, Principles and methods of teaching a) Strategies of teaching b) planning of teaching c) Organization d) writing lesson plans e) Audio-visual aids f) Teaching methods.

Total Periods: 30

EXPERIENTIAL LEARNING

1. How to improve the standards and future challenges of physiotherapy practice
2. Case studies of Legal issues in physiotherapy practice
3. Assessment of various tests and scales in physiotherapy
4. Demonstration of various teaching methods in physiotherapy education
5. Leadership versus Mentorship and its role in physiotherapy

RESOURCES

BOOKS:

1. Katherine K.Johnson: Bio ethics in Physical therapy; Cognella, Inc., publisher, 2022.
2. Barbara: Ethics in Rehabilitation; Slack publishers, 2ndEdition, 2012.
3. Nancy Kirsch: Professional issues & Ethics in Physical therapy- A case based approach; McGraw Hill publishers,2ndEdition. 2022.
4. John Swain: The use of Counselling Skills; BH/Elsevier publisher, 1995.
5. Joy: Clinical Reasoning in the health professions; BH/Elsevier publisher,3rd Edition, 2008.
6. Dr.Rajendra Rajput: Essentials of community physiotherapy & Ethics; Medico refresher publications, 2019.
7. Jennifer Green-Wilson: Learning to lead in Physical therapy; Slack Publications, 1stEdition, 2020.

VIDEO LECTURES:

1. <https://youtu.be/bf1Wzy1amuw>
2. <https://youtu.be/iFwZrNAeHks>
3. https://youtu.be/zU5_4kc0GjY

WEB RESOURCES:

1. <https://www.physio-pedia.com/Ethics>
2. https://world.physio/sites/default/files/2022-03/PS-2022-Ethical_responsibilities_principles_Eng.pdf
3. <https://collegeofphysiotherapy.com/the-iap-ethical-rules-regulations/>
4. https://www.researchgate.net/publication/323934923_Medico-Legal_Practice_and_Physiotherapy_A_Study_in_Mekelle_Ethiopia
5. <https://ncert.nic.in/textbook/pdf/lehe108.pdf>
6. <https://www.physiospot.com/2021/01/25/blended-learning-for-physiotherapy-education/>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202001	EXERCISE PHYSIOLOGY AND NUTRITION	4	-	2	-	5
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on nutrition, energy metabolism & transfer, measurement of energy expenditure & energy conservation in different physical states and body composition & obesity control.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the influence of nutrition & special aids on physical performance.
- CO2.** Analyse and evaluate energy transfer, energy expenditure in different states of Physical activity.
- CO3.** Demonstrate the exercises and its effects on various systems of human body.
- CO4.** Analyse the effects on human body under various environmental conditions and suggesting appropriate training.
- CO5.** Evaluate the client fitness, clinical condition, geriatric problems and recommending appropriate exercises.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	-	2	1	-	-	-	-	3	-	3
CO2	3	3	2	-	-	-	-	-	3	-	3
CO3	3	1	-	-	-	-	-	-	3	-	3
CO4	3	3	3	-	-	-	-	-	3	-	3
CO5	3	3	3	1	-	-	-	-	3	-	3
Course Correlation Mapping	3	3	3	1	-	-	-	-	3	-	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction to Nutrition and Metabolism (10 Periods)

Macro nutrients & Micro nutrients, Importance of water in exercise. Fatigue & its Assessment and how to control fatigue. Ergogenic aids/Special aids in sports performance. Carbohydrate, Protein & fat metabolism. Metabolic mill.

Module 2: Energy transfer and Energy expenditure on activities (15 Periods)

Energy transfer in exercise, Measurement of Human energy expenditure. Human energy expenditure during rest and physical activity, Energy expenditure during walking jogging, running and swimming. Individual differences and measurement of energy capacities.

Module 3: Effect of exercise on various systems (10 Periods)

Responses and adaptations of the following systems to exercise and training: the cardio-pulmonary system, the musculoskeletal system, the nervous system, and the endocrine system.

Module 4: Environment influence & Exercise Performance (10 Periods)

Mechanism of thermo regulation, Thermoregulation and environmental stress during exercise. Exercises at medium & High altitude. Sport diving, Microgravity- the cost frontier. Principles of Exercise Training, Enhancement of energy capacity - Training for anaerobic and aerobic power. Muscular strength: Training muscles to become stronger – Strength measurement and resistance training. Structural and functional adaptations to resistance training.

Module 5: Body composition, Assessment, Weight control & Prescription of Exercises (15 Periods)

Body composition & Assessment, energy balance and physique, performance and physical activity, obesity and weight control. Exercise, successful aging and disease prevention. Aging and physiologic function, Physical activity, health and longevity, Coronary-heart disease. Clinical exercise prescription for cancer, cardiovascular and pulmonary Rehabilitation

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Influence of Nutrition & Special aids on Exercise Performance.
2. Measurement of Human energy Expenditure, Total daily energy expenditure & advice on Diet.
3. Demonstration of the exercises and its influence on cardio pulmonary system & other systems.
4. Measurement of Aerobic & Anaerobic Capacities.
5. Assessment of body composition & required exercise selection.

RESOURCES

BOOKS:

1. Axen: Illustrated principles of exercise physiology, Pearson publication, 2000.
2. Katch: Exercise physiology, energy nutrition, and human performance; Wolters Kluwer Health publication; 9th International Edition, 2022.
3. Shyamal Oley: Essentials of Exercise Physiology; Jaypee Brothers Medical Publishers, 1st Edition, 2018.
4. Swapankumardey: A textbook of sports & exercise physiology; Jaypee Brothers Medical Publishers; 2nd Edition, 2022.
5. Wilmore: Physiology of sport & Exercise. Human Kinetics publishers; 8th Edition, 2021.
6. Stephen R. Bird: Exercise physiology for health professionals; Nelson Thornes publishers Ltd, 1997

VIDEO LECTURES:

1. <https://youtu.be/LtO-DzWj0fc>
2. https://youtu.be/aq4TQ_0-oz4
3. https://youtu.be/QAiw_QtDaWI
4. <https://youtu.be/xUr6tS7QSdM>
5. <https://youtu.be/xQgYu4p1hvc>
6. <https://youtu.be/tBCtVoHTMzU>

WEB RESOURCES:

1. <https://www.pdfdrive.com/>
2. https://www.physio-pedia.com/Principles_of_Exercise
3. <https://nzihf.ac.nz/personal-training/exercise-principles/>
<https://sirc.ca/blog/environmental-factors-in-exercise-and-sports-performance/>
https://www.physio-pedia.com/Body_Composition
https://www.physio-pedia.com/Exercise_Endocrine_System_Interaction

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202002	CLINICAL ELECTROPHYSIOLOGY	5	-	2	-	6
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion about various clinical modalities of electrophysiology.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the Excitable tissue of Nerve and Muscle in clinical electrophysiology
- CO2.** Analyze and evaluate the nerve conduction studies in clinical physiology.
- CO3.** Assess the diagnostic modalities in clinical Electrophysiology.
- CO4.** Evaluate the Clinical application of Electromyography and nerve conduction velocity.
- CO5.** Trace the pathways of nerve and brain in Adults and Paediatric Practice and role in Clinical Neurophysiology.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	-	-	-	-	-	3	-	-
CO2	3	2	3	-	-	-	-	-	3	-	-
CO3	3	3	3	-	-	-	-	1	3	-	-
CO4	3	3	3	-	-	-	-	2	3	-	-
CO5	3	3	3	-	-	-	-	2	3	-	-
Course Correlation Mapping	3	3	3	-	-	-	-	2	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction to Clinical Electrophysiology (10 Periods)

History of Clinical Neurophysiology; An introduction to electro diagnostic signals and their measurements; Electrical events at synapse; chemical transmission of synaptic activity; Physiology of Pain, Electrical and ionic events in receptors; Electrical activity of the brain.

Introduction to Excitable tissue – Nerve, Excitation and Conduction, Measurement of Electrical Events, Ionic basis of Excitation and Conduction, Physiological basis of Nerve Conduction Tests.

Introduction to Excitable tissue –Muscle: Cardiac Muscle: Electrical Properties **Skeletal Muscle:** Electrical Phenomena and Ionic Fluxes, Contractile Responses **Smooth Muscle:** Electrical Properties

Module 2: Introduction to Diagnostic Modalities in Clinical Electrophysiology (10 Periods)

Introduction to Diagnostic Modalities: Electro Cardio Gram (ECG) and physiological basis of ECG, Cath lab, TMT; Electromyography (EMG) and physiological basis of EMG, ENMG; Electroencephalogram (EEG) – Physiological basis of EEG; X-ray, CTScan, MRI Scan, Doppler, Ultrasound, fluoroscopy.

Module 3: Nerve Conduction Study to upper and lower limbs (25 Periods)

Principles of Nerve Conduction Study-Compound Motor Action Potential, Sensory Nerve Action Potential, F-Wave, H-Reflex, variables of NCV

Nerve Conduction Study to upper limb: Median nerve, Ulnar nerve, Radial nerve, Brachial plexus, Cervical Radiculopathy

Nerve Conduction Study to lower limb: Lumbar plexus, Sacral plexus, Lumbo sacral Radiculopathy, Anomalous innervations of the extremities, Nerve conduction of nonlimbic nerves, Late responses, Autonomic nervous system testing

Module 4: Clinical application of Electromyography and nerve conduction Study (15 Periods)

Electromyography (EMG): Introduction & Technique to EMG;

Clinical application of Electromyography and nerve conduction study: Electromyographic findings in neurological disorders, Nerve conduction and EMG studies in polyneuropathies;

Repetitive nerve stimulation (RNS); Single fiber and macro electromyography.

Module 5: Evoked Potential in Adult and Paediatrics (15 Periods)

Evoked Potential: Motor Evoked Potential: Sensory Evoked Potential: Visual Evoked Potential (SIGHT), Auditory Evoked Potential (SOUND), Somatosensory Evoked Potential (TOUCH), Cognitive Evoked Potential. **Electro diagnosis in Pediatric Practice:** Nerve Conduction and Electromyography, Sensory Evoked Potential in Pediatric Practice: Visual Evoked Potential in Pediatric Practice, Auditory Evoked Potential in Pediatric Practice, Somatosensory Evoked Potential in Pediatric Practice

Role of Clinical Neurophysiology in the Prognosis of Neuromuscular Disorders

Total Periods: 75 Hours

EXPERIMENTAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstrate the Excitable tissue of Nerve and Muscle in clinical electrophysiology
2. Analyze and evaluate the nerve conduction studies in clinical physiology.
3. Assess the diagnostic modalities in clinical Electrophysiology.
4. Evaluate the Clinical application of Electromyography and nerve conduction velocity.
5. How to predict the pathways of nerve and brain in Adults and Paediatric Practice and role in Clinical Neurophysiology.

RESOURCES

BOOKS

1. UK Misra |J Kalita, Clinical Neurophysiology, ELSEVIER, 4th Edition, 2019
2. Jun Kimura, OUP USA, Electro diagnosis in disease of nerve and muscle-, 4th Edition, 2014
3. Wall&Malzak's, Saunders, Text book of Pain,6th Edition, 2013
4. Nelson and Pearson, Clinical Electrotherapy,3rd Edition, 1999

VIDEO LECTURES:

1. <https://youtu.be/auogbJFitmI>
2. <https://youtu.be/rqUINdIIB50>
3. <https://youtu.be/xIZQRjkwV9Q>
4. <https://youtu.be/p38nzOGJZtI>

WEB RESOURCES:

1. <https://www.sciencedirect.com/journal/clinical-neurophysiology>
<https://www.sciencedirect.com/journal/clinical-neurophysiology-practice>
2. <https://www.ifcn.info/clinical-neurophysiology.asp>
3. <https://www.elsevier.com/journals/clinical-neurophysiology/1388-2457?generatepdf=true>
4. <https://journals.physiology.org/journal/jn>
5. <https://www.frontiersin.org/articles/10.3389/fneur.2021.770791/full>
6. <https://www.mdpi.com/2077-0383/11/14/4184>
7. <https://www.sciencedirect.com/journal/clinical-neurophysiology>
<https://www.sciencedirect.com/journal/clinical-neurophysiology-practice>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT201007	RESEARCH METHODOLOGY AND BIOSTATISTICS	4	-	-	-	4
Pre-Requisite	-					
Anti-Requisite	- 22PT201001- RESEARCH METHODOLOGY FOR BIOSTATISTICS					
Co-Requisite	-					

COURSE DESCRIPTION: The course is developed for the students to understand the underlying concepts of research methodology and a systematic approach for carrying out research in the domain of interest. The course is emphasised on developing skills to recognise and reflect the strength and limitation of different types of research; data collection methods, methods of Processing and analysing data. The course also emphasises on interpreting the findings and research articulating skills.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the underlying concepts of research methodology, types of research and the systematic research process and philosophy of research design.
- CO2.** Demonstrate the philosophy of formulation of research problem, methods of data collection, review of literature and formulation of working hypothesis.
- CO3.** Demonstrate the philosophy of biostatistics and its relevance to research methodology for carrying research in the domain.
- CO4.** Analyze various data processing & techniques and their significance in research.
- CO5.** Develop skills to interpret the findings and research articulating skills along with the ethics of research.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	3	-	-
CO2	3	2	1	-	-	-	-	-	3	-	-
CO3	3	1	-	-	-	-	-	-	3	-	-
CO4	3	3	2	-	-	-	-	-	3	-	-
CO5	3	2	1	-	-	3	-	1	3	-	-
Course Correlation Level	3	2	2	-	-	3	-	1	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO RESEARCH METHODOLOGY (10 Periods)

Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research and Scientific Method, Research Process, Criteria of Good Research. Research design—Basic Principles, Need of research design, Features of good design, Basic principles of experimental designs,

Module 2: RESEARCH PROBLEM FORMULATION (10 Periods)

Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem – Data collection – Primary and secondary sources; Critical literature review – Identifying gap areas from literature review, Development of working hypothesis.

Module 3: INTRODUCTION TO BIOSTATISTICS (12 Periods)

Meaning, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

Module 4: STATISTICAL ANALYSIS OF DATA (18 periods)

Need for measures of central Tendency: mean, median and mode, Guidelines for the use of various measures of central tendency, Standard deviation; Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors; Correlation and Regression; Analysis of variance (ANOVA): Basic principle of ANOVA, ANOVA technique; Normal distribution.

Module 5: INTERPRETATION AND REPORT WRITING (10 Periods)

Interpretation: Meaning of interpretation; Techniques of interpretation; Precautions in Interpretation.

Report Writing:

Significance, Different Steps, Layout, Types of reports, Mechanics of Writing a Scientific Research Reports and journals, Precautions in Writing Reports-Plagiarism, Critics in the research.

Total Periods: 60

EXPERIENTIAL LEARNING

5. Conduct a survey based on a hypothesis, analyze the data collected and draw the inferences from the data.
6. Review the literature on the given topic and should identify the scope/gaps in the literature and develop a research hypothesis.
7. Study a case, formulate the hypothesis and identify an appropriate testing technique for the hypothesis.
8. Study an article and submit a report on the inferences and should interpret the findings of the article.

Master of Physiotherapy- Cardiovascular and Pulmonary

BOOKS:

1. C.R. Kothari, *Research Methodology: Methods and Techniques*, New Age International Publishers, 2nd revised edition, New Delhi, 2004.
2. Mahajan: *methods in biostatistics for medical students & research workers*. Jaypee Brothers Medical Publishers; 9th edition (28th February 2018)
- 3.
4. R. Panneerselvam, *Research Methodology*, PHI learning Pvt. Ltd., 2009.
5. Carolyn M. Hicks: *Research methodology for clinical therapist*. Churchill Livingstone; 5th edition (7th August 2009)

VIDEO LECTURES:

1. <https://nptel.ac.in/courses/121106007>
2. https://onlinecourses.nptel.ac.in/noc22_ge08/preview
3. <https://www.youtube.com/watch?v=VK-rnA3-41c>

Web Resources:

1. <https://www.scribbr.com/category/methodology/>
2. <https://leverageedu.com/blog/research-design/>
3. <https://prothesiswriter.com/blog/how-to-formulate-research-problem>
4. <https://www.formpl.us/blog/hypothesis-testing>
5. <https://www.datapine.com/blog/data-interpretation-methods-benefits-problems/>
6. <https://leverageedu.com/blog/report-writing/>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22MG207601	PROJECT MANAGEMENT	2	-	-	-	2
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite						

COURSE DESCRIPTION: To understand the importance of decision-making while implementing any project and interpret and discuss the results of qualitative and quantitative analysis

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Understand the basic introduction to project management
- CO2** Apply the methods of project identification and selection.
- CO3** Understand project allocation methods and evaluation.
- CO4** Analyse the techniques for project time, review, and cost
- CO5** Understand the factors of risk and quality of a project.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	2	1	-	-	-	-	-
CO2	1	1	2	2	-		2		1
CO3	2	2	1	2	1	-	-	1	-
CO4	3	1	2	2	1	-	-	-	-
CO5	2	2	1	2	1	1	-	-	-
Course Correlation Mapping	2	2	2	2	1	1	2	1	1

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction

(05 Periods)

Concept of project management, project definition and key features of projects, project life cycle phases, typical project management issues, basic project activities

Module 2: Project Identification and Selection**(06 Periods)**

Identification and screening (brainstorming, strength and weakness in the system, environmental opportunities and threats), Project evaluation methods- Payback period, Net present value, Internal rate of return and project evaluation under uncertainty.

Module 3: Project Resource Management**(07 Periods)**

Scheduling resources, resource allocation methods, project crashing and resource leveling, working of systems, design of systems, project work system design, project execution plan, project procedure manual project control system, planning scheduling and monitoring

Module 4: Time and Cost Management**(05 Periods)**

Time Management-Network diagram, forward and backward pass, critical path, PERT and CPM, AOA and AON methods, tools for project network, Cost management-earned value method

Module 5: Risk and Quality Management**(07 Periods)**

Risk identification, types of risk, risk checklist, risk management tactics, risk mitigation and contingency planning, risk register, communication management, Quality assurance and quality control, quality audit, methods of enhancing quality

Total Periods: 30**EXPERIENTIAL LEARNING**

1. Refer to any video lecture on project evaluation methods and give a brief seminar using PPT
2. Select any company wherein you will get the details of activities and time and draw the project network diagram and submit a report.

3.

Activity	Predecessor Activity	Normal Time (Weeks)	Crash Time (Weeks)	Normal Cost (Rs.)	Crash Cost (Rs.)
A	-	4	3	8,000	9,000
B	A	5	3	16,000	20,000
C	A	4	3	12,000	13,000
D	B	6	5	34,000	35,000
E	C	6	4	42,000	44,000
F	D	5	4	16,000	16,500
G	E	7	4	66,000	72,000
H	G	4	3	2,000	5,000

Determine a crashing scheme for the above project so that the total project time is reduced by 3 weeks

4. Collect any case study that discusses the process of probability calculation of success of the project and submit a report

RESOURCES

TEXT BOOKS:

1. R.Panneerselvam and P.Senthil Kumar (2013), Project Management, PHI Learning Private Limited.
2. Prasanna Chandra (2014), Projects: Planning, Analysis, Selection, Financing, implementation, and Review.

REFERENCE BOOKS:

1. A Guide to the Project Management Body of Knowledge: (PMBOK Guide) by Project Management Institute, 2013.
2. Gopala Krishnan & Rama Murthy, A Text book of Project Management, McMillan India.
3. S. Choudhary (2004), Project Management, Tata McGraw Hill Publication.

VIDEO LECTURES:

1. https://onlinecourses.nptel.ac.in/noc19_mg30/preview
2. <https://archive.nptel.ac.in/courses/110/104/110104073/>

WEB RESOURCES:

1. <https://www.pmi.org/about/learn-about-pmi/what-is-project-management>
2. <https://www.manage.gov.in/studymaterial/PM.pdf>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22MG207602	ESSENTIALS OF BUSINESS ETIQUETTES	2	-	-	-	2

Pre-Requisite

Anti-Requisite

Co-Requisite -

COURSE DESCRIPTION: This course is designed for learners who desire to improve their Business etiquette and professionalism.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** learn the principles of business etiquettes and professional behavior
- CO2.** understand the etiquettes for making business correspondence effective
- CO3.** Develop awareness of dining and multicultural etiquettes
- CO4.** Demonstrate an understanding of professionalism in terms of workplace behaviors and workplace relationships.
- CO5.** Understand attitudes and behaviors consistent with standard workplace expectations.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	-	-	-	1	-	-	-	-	-	-
CO2	1	1	2	1	-	1	-	-	-	-	-	-
CO3	2	-	2	-	1	-	-	-	-	2	-	-
CO4	1	2	-	1	-	-	-	-	-	2	-	-
CO5	1	2	1	-	-	-	-	-	-	2	2	-
Course Correlation Mapping	2	2	2	1	1	1	-	-	-	2	2	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Business Etiquettes- An Overview (06 Periods)

Significance of Business Etiquettes in 21st Century- Professional Advantage; Need and Importance of Professionalism; Workplace Etiquette: Etiquette for Personal Contact- Personal Appearance, Gestures, Postures, Facial Expressions, Eye-contact, Space distancing

Module 2: Communication Skills (06 Periods)

Understanding Human Communication, Constitutive Processes of Communication, Language as a tool of communication, Barriers to Effective communication, and Strategies to Overcome the Barriers.

Module 3: Teamwork and Leadership Skills (06 Periods)

Concept of Teams; Building effective teams; Concept of Leadership and honing Leadership skills. Personality: Meaning & Definition, Determinants of Personality, Personality Traits, Personality and Organisational Behaviour Motivation: Nature & Importance, Herzberg's Two Factor theory, Maslow's Need Hierarchy theory, Alderfer's ERG theory

Module 4: Interview Skills (06 Periods)

Interview Skills: in-depth perspectives, Interviewer and Interviewee, Before, During and After the Interview, Tips for Success. Meeting Etiquette: Managing a Meeting-Meeting agenda, Minute taking,; Duties of the chairperson and secretary; Effective Meeting Strategies - Preparing for the meeting, Conducting the meeting, Evaluating the meeting

Module 5: Decision-Making and Problem-Solving Skills (06 Periods)

Decision-Making and Problem-Solving Skills: Meaning, Types and Models, Group and Ethical Decision-Making, Problems and Dilemmas in application of these skills. Conflict Management: Conflict - Definition, Nature, Types and Causes; Methods of Conflict Resolution.

Total Periods:30

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Collect the case studies related to successful leaders and their traits.
2. Conduct a mock interview showcasing interview skills.
3. The case studies will be collected as Assignments and the same will be evaluated.

RESOURCES

TEXT BOOKS:

1. Barbara Pachter, Marjorie Brody. Complete Business Etiquette Handbook. Prentice Hall, 2015.
2. Mahanand, Anand. English for Academic and Professional Skills. Delhi: McGraw, 2013. Print.

REFERENCE BOOKS:

1. Pease, Allan and Barbara Pease. The Definitive Book of Body Language. New Delhi: Manjul Publishing House, 2005.
2. Rani, D Sudha, TVS Reddy, D Ravi, and AS Jyotsna. A Workbook on English Grammar and Composition. Delhi: McGraw, 2016.

VIDEO LECTURES:

- 1 <https://www.youtube.com/watch?v=NqIfZOPMqjA>
.
- 2 <http://www.nitttrc.edu.in/nptel/courses/video/109104107/L24.html>
.

WEB RESOURCES:

1. <http://elibrary.gci.edu.np/bitstream/123456789/685/1/BM-783%20The%20Essential%20Guide%20to%20Business%20Etiquette%20by%20Lillian%20H.%20Chaney%2C%20Jeanette%20S.%20Martin.pdf>
2. [The Essentials of Business Etiquette: How to Greet, Eat, and Tweet Your Way to Success by Barbara Pachter \(Ebook\) - Read free for 30 days \(everand.com\)](#)

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CE201701	DISASTER MANAGEMENT	3	-	-	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on disaster prone areas in India, repercussions of disasters and hazards, disaster preparedness and management, risk assessment and disaster management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Analyze the vulnerability of an area to natural and man-made disasters/hazards as per the guidelines to solve complex problems using appropriate techniques ensuring safety, environment and sustainability.
- CO2.** Analyze the causes and impacts of disasters using appropriate tools and techniques and suggest mitigation measures ensuring safety, environment and sustainability besides communicating effectively in graphical form.
- CO3.** Suggest the preparedness measures using appropriate tools and techniques and suggest mitigation measures ensuring safety, environment and sustainability.
- CO4.** Analyze the Risk Assessment using appropriate tools and techniques and suggest mitigation measures ensuring safety, environment and sustainability.
- CO5.** Design disaster management strategies to solve pre, during and post disaster problems using appropriate tools and techniques following the relevant guidelines and latest developments ensuring safety, environment and sustainability besides communicating effectively in graphical form.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	2	2	2	2	2	-	-	-	-
CO2	3	3	-	2	2	2	2	-	-	2	-	-
CO3	3	3	-	2	2	2	2	-	-	-	-	-
CO4	3	3	-	3	2	2	2	-	-	-	-	-
CO5	3	2	3	2	2	2	1	2	-	1	3	2
Course Correlation Mapping	3	3	3	3	2	2	2	2	-	2	3	2

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: DISASTER PRONE AREAS IN INDIA (09 Periods)

Introduction: Disaster: Definition, Factors and Significance; Difference Between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types And Magnitude.

Disaster Prone Areas: Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics.

Module 2: REPERCUSSIONS OF DISASTERS AND HAZARDS (09 Periods)

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

Module 3: DISASTER PREPAREDNESS AND MANAGEMENT (11 Periods)

Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.

Module 4: RISK ASSESSMENT (08 Periods)

Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.

Module 5: DISASTER MANAGEMENT (08 Periods)

Disaster management organization and methodology, Disaster management cycle, Disaster management in India – Typical cases and Cost-benefit analysis, Disaster management programs implemented by NGOs and Government of India, Usage of GIS and Remote sensing techniques in disaster management, Leadership and Coordination in Disaster management, Emerging trends in disaster management.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Perform hazard assessment and vulnerability analysis for any nearby town/city and prepare a detailed report of possible impacts of various disasters on environment, infrastructure and development.
2. Prepare a detailed report on the causes and effects of Tsunami that was occurred in the year 2004. Also discuss various advancements in Tsunami warning systems.
3. Identify the major causes of urban floods in cities like Chennai, Hyderabad & Mumbai. Also list various mitigation strategies to reduce the impact of floods.
4. Prepare a detailed report on how various man-made activities are directly/indirectly related to the occurrence of landslides that occurred in recent days in India.
5. Visit AP State Disaster Response and Fire Services Department and record about various methods used by them in mitigating disasters and their management.

RESOURCES

TEXT BOOKS:

1. Sharma V. K., *Disaster Management*, MedTech Publishing, 2nd Edition, 2013.
2. Anand S. Arya, Anup Karanth, and Ankush Agarwal, *Hazards, Disasters and Your Community: A Primer for Parliamentarians*, GOI-UNDP Disaster Risk Management Programme, Government of India, National Disaster Management Division, Ministry of Home Affairs, New Delhi, Version 1.0, 2005

REFERENCE BOOKS:

1. Donald Hyndman and David Hyndman, *Natural Hazards and Disasters*, Cengage Learning, USA, 5th Edition, 2015.
2. *Disaster Management in India*, A Status Report, Ministry of Home Affairs, Govt. of India, May 2011.
3. Rajendra Kumar Bhandari, *Disaster Education and Management: A Joyride for Students, Teachers, and Disaster Managers*, Springer India, 2014.
4. Singh R. B., *Natural Hazards and Disaster Management*, Rawat Publications, 2009.
5. R. Nishith, Singh AK, *Disaster Management in India: Perspectives, issues and strategies*, New Royal book Company.
6. Sahni, PardeepEt.Al. (Eds.), *Disaster Mitigation Experiences And Reflections*, Prentice Hall of India, New Delhi.
7. Goel S. L. , *Disaster Administration And Management Text And Case Studies*, Deep &Deep Publication Pvt. Ltd., New Delhi

VIDEO LECTURES:

1. <https://nptel.ac.in/courses/105104183>
2. <https://www.digimat.in/nptel/courses/video/124107010/L01.html>

WEB RESOURCES:

1. <https://egyankosh.ac.in/handle/123456789/25093>
2. <https://www.egyankosh.ac.in/handle/123456789/25912>
3. <https://www.nios.ac.in/media/documents/333courseE/12.pdf>
4. <https://ndmindia.mha.gov.in/images/public-awareness/Primer%20for%20Parliamentarians.pdf>

Course Code	Course Title	L	T	P	S	C
22CM207601	ESSENTIAL OF LEADERSHIP	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course introduces undergraduate students to fundamental leadership concepts, self-management skills, teamwork, ethical leadership, and professional responsibility. It prepares students to function as effective leaders in healthcare and academic environments.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO6.** Understand basic leadership concepts, styles, and theories
- CO7.** Demonstrate self-awareness, emotional intelligence, and interpersonal skills
- CO8.** Apply leadership and communication skills in teamwork and problem-solving
- CO9.** Exhibit ethical, professional, and socially responsible leadership behaviors

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	2	2	2	2	2	-	-	-	-
CO2	3	3	-	2	2	2	2	-	-	2	-	-
CO3	3	3	-	2	2	2	2	-	-	-	-	-
CO4	3	3	-	3	2	2	2	-	-	-	-	-
Course Correlation Mapping	3	3	3	3	2	2	2	2	-	2	3	2

Correlation Levels: 3: High; 2: Medium; 1: Low

Module 1: FOUNDATIONS OF LEADERSHIP**(08 Periods)**

Meaning and importance of leadership, Difference between leadership and management, Leadership styles: Autocratic, Democratic, Laissez-faire, Transformational, Qualities of an effective leader, Leadership in healthcare and academics

Module 2: SELF-LEADERSHIP AND EMOTIONAL INTELLIGENCE**(07 Periods)**

Self-awareness and self-management, Emotional intelligence: components and importance, Motivation and goal setting, Stress management and resilience, Time management for leaders

Module 3: COMMUNICATION AND TEAM LEADERSHIP**(08 Periods)**

Effective communication skills (verbal, non-verbal, listening), Team dynamics and group behavior, Conflict management and negotiation, Decision-making and problem-solving skills, Leadership roles in multidisciplinary teams

Module 4: ETHICAL AND PROFESSIONAL LEADERSHIP**(07 Periods)**

Ethics and values in leadership, Professional responsibility and accountability, Social responsibility and community leadership, Leadership challenges in healthcare settings, Developing leadership skills for future careers

Total Periods: 45**EXPERIENTIAL LEARNING**

- 1 Students maintain a reflective journal on personal leadership strengths and weaknesses, Emotional intelligence experiences, Stress management and time management practices
- 2 Students perform role plays on team leadership scenarios, Conflict resolution in healthcare settings, Decision-making under pressure
- 3 Analysis of real-life leadership cases in healthcare institutions, Community health programs, Academic leadership situations
- 4 Small group task such as organizing a health awareness program, Leading a peer-learning session, Planning a simulated clinical team workflow
- 5 Peer Feedback & Self-Assessment on structured peer evaluation on leadership behavior during activities, Self-assessment using leadership trait checklists

RESOURCES

TEXT BOOKS:

3. Northouse, P. G. *Leadership: Theory and Practice*, Sage Publications
2. Goleman, D. *Emotional Intelligence*, Bantam Books
3. Covey, S. R. *The 7 Habits of Highly Effective People*, Free Press
4. Maxwell, J. C. *Developing the Leader Within You*, HarperCollins

VIDEO LECTURES:

3. <https://nptel.ac.in/courses/105104183>
4. <https://www.digimat.in/nptel/courses/video/124107010/L01.html>

WEB RESOURCES:

5. <https://egyankosh.ac.in/handle/123456789/25093>
6. <https://www.egyankosh.ac.in/handle/123456789/25912>
7. <https://www.nios.ac.in/media/documents/333courseE/12.pdf>
8. <https://ndmindia.mha.gov.in/images/public-awareness/Primer%20for%20Parliamentarians.pdf>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211001	CLINICAL TRAINING-I	-	-	-	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides assessing & evaluating the patient and advising appropriate treatment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Assess the patient illness by proper examination.
- CO2.** Identify the patient clinical condition and advise appropriate physiotherapy treatment.
- CO3.** Work individually and in teams following ethical practice.
- CO4.** Record the clinical studies for future advancements.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	-	-	-	3	-	-
CO2	3	1	3	-	-	-	-	-	-	3	3
CO3	-	-	-	3	3	-	-	-	-	-	-
CO4	3	1	-	-	3	3	-	2	-	-	-
Course Correlation Mapping	3	2	2	3	3	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Clinical Training-I - **6 Credits**;

Clinical Training-I - 3 Hours/day.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211005	LITERATURE REVIEW AND TEACHING-I	-	-	-	-	1

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with presentations on recent advancements and teaching for under-graduate students.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Formulate problem based on the review program specific literature on a chosen topic.

CO2. Demonstrate teaching capabilities on discipline specific topics at under graduate level.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	-	-	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Applicable to Literature Review and Teaching-I-1 Credit.

Literature Review and Teaching-I- 1 Hour/Week

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202003	CLINICAL BIOMECHANICS AND KINESIOLOGY	4		2	-	5
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion about the knowledge of human joint Structure and the principles of biomechanics in clinical application.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the Biomechanical Application to Joint Structure and Function.
- CO2.** Analyze and Evaluate the Axial Skeletal, Upper and Lower Extremity Joint Complexes.
- CO3.** Trace out the Determinants of Gait and Ergonomic Approach to lifting and handling.
- CO4.** Work independently and in teams to solve problems with effective communications.

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	-	-	2	-	1	3	1	1
CO2	3	2	3	-	-	2	-	1	3	2	1
CO3	3	3	3	-	-	2	-	1	3	3	1
CO4	3	2	2	-	-	2	-	1	1	1	1
Course Correlation Level	3	3	3	-	-	2	-	2	3	3	1

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: FOUNDATIONAL CONCEPTS OF JOINT STRUCTURE AND FUNCTION (10 Periods)

Biomechanical Applications to Joint Structure and Function:-General Kinematics and Kinetics of Joint Structure and Function.

Joint Structure and Function: General Changes with Disease, Injury, Immobilization, Exercise, and Overuse.

Muscle Structure and Function:-Effects of Immobilization, Injury, and Aging, Kinematics and Kinetics of Posture and Gait.

Module 2: AXIAL SKELETAL JOINT COMPLEXES (08 Periods)

Temporomandibular Joint:-Structure and Function of the Temporomandibular Joint, Age-Related Changes in the Temporomandibular Joint and Dysfunctions.

Vertebral Column:- Introduction to General Structure and Function of the Vertebral Column, Regional Structure and Functions of the Cervical Region, the Thoracic Region, the Lumbar Region and the Sacral Region, Muscles of the Vertebral Column-The Craniometrical / Upper Thoracic Regions, Lower Thoracic / Lumbopelvic Regions, Muscles of the Pelvic Floor, Effects of Aging.

Thorax and Chest Wall:-Introduction to General Structure and Function of Rib Cage, Muscles Associated With the Rib Cage, Coordination and Integration of Ventilatory Motions, Developmental Aspects of Structure and Function- Differences Associated with the Neonate and the Elderly, Pathological Changes in Structure and Function of Chronic Obstructive Pulmonary Disease.

Module 3: UPPER EXTREMITY JOINT COMPLEXES (15Periods)

Shoulder complex:-Introduction: Components of the shoulder complex- Sternoclavicular joint, Acromioclavicular joint, Scapulothoracic joint, Glenohumeral joint, Integrated function of the shoulder Complex-Scapulothoracic and Glenohumeral contributions, Sternoclavicular and acromioclavicular contributions, Structural Dysfunction, Muscles Of Elevation, Muscles of depression.

Elbow Complex:-Structure and Functions of Humeroulnar and Humeroradial joint; Structure of Superior and Inferior Radioulnar Joints; Mobility and Stability of Elbow Complex- Functional Activities, Relationship to the Hand and Wrist; Effects of Age and Injury.

Wrist and Hand Complex:- Structure and Functions of Radiocarpal and Midcarpal Joint of the Wrist Complex. The Hand Complex: Carpometacarpal, Metacarpophalangeal and Interphalangeal Joints of the Fingers, Extrinsic Finger Flexors and Extensors, Extensor Mechanism, Intrinsic Finger Musculature, Structure of the Thumb, Thumb Musculature;

Prehension: Power Grip, Precision Handling; Functional Position of the Wrist and Hand.

Module 4: LOWER EXTREMITY JOINT COMPLEXES (15 Periods)

Hip Complex- Structure and Function of the Hip Joint, Hip Joint Forces, and Muscle Function in Stance-Bilateral Stance, Unilateral Stance, Reduction of Muscle Forces in Unilateral Stance, Hip Joint Pathology: Arthrosis, Fracture, Bony Abnormalities of the Femur.

Knee Complex: Tibiofemoral Joint: Structure and Function of the Tibiofemoral Joint- Joint Kinematics, Muscles, Stabilizers of the Knee; Patellofemoral Joint: Patellofemoral Articular Surfaces and Joint

Master of Physiotherapy- Cardiovascular and Pulmonary

Congruence, Motions of the Patella, Patellofemoral Joint Stress, Frontal Plane Patellofemoral Joint Stability, Weight-Bearing vs. Non-Weight-Bearing Exercises with Patellofemoral Pain; Effects of Injury and Disease of Tibiofemoral and Patellofemoral Joint.

Ankle and Foot Complex: Introduction, Definitions of Motions, Ankle Joint-Ankle Joint Structure and Function; Subtalar Joint Structure and Function; Transverse Tarsal Joint Structure and Function; Tarsometatarsal Joint Structure and Function; Metatarsophalangeal Joint Structure and Function; Interphalangeal Joints- Plantar Arches- Structure and Function of the Arches, Muscular Contribution to the Arches, Muscles of the Ankle and Foot- Extrinsic Musculature, Intrinsic Musculature, Deviations from Normal Structure and Function.

Module 5: INTEGRATED FUNCTIONS OF POSTURE AND GAIT

(12 Periods)

Posture: Introduction to Static and Dynamic Postures, Postural Control, Major Goals and Basic Elements of Control; Optimal Posture: Analysis of Standing Posture, Sitting Postures and Lying Postures; Effects of Age, Pregnancy, Occupation, and Recreation on Posture; Clinical kinesiology of posture.

Gait: Introduction to General Features of Gait; Phases of the Gait Cycle, Determinants of Gait; Kinematics and Kinetics of the Trunk and Upper Extremities in Gait. Stair and Running Gaits; Effects of Age, Gender, Assistive Devices, and Orthoses; Abnormal Gait- Structural Impairment, Functional Impairment;

Ergonomic Approach to lifting and handling, work space and Environment.

Total Periods: 60

EXPERIENTIAL LEARNING

List of Experiments

1. How to design for ease and Efficiency in Ergonomics.
2. Demonstrate the Biomechanical Application to Joint Structure and Function.
3. Analyze and evaluate the Axial Skeletal, Upper and Lower Extremity Joint Complexes.
4. Assess the Integrated Function of Posture and Gait.
5. Evaluate the activities of daily living ADL – like sitting to standing, throwing, lifting.
6. Trace out the Determinants of Gait and Ergonomic Approach to lifting and handling.

RESOURCES:

BOOKS:

1. Pamela K. Levangie & Cynthia C, Joint Structure & Function, Jaypee Brothers Medical Publishers –Sixth edition, 2019
2. Jim Richards, Clinical Biomechanics- Elsevier, 2nd edition, 2022.
3. Peggy A. Houglum, Dolores B. Bertoti, Brunnstrom's Clinical Kinesiology, F.A.DAVIS COLLECTION 6th ed./revised 2012.
4. Pavan Kumar G & Ilona Gracie De Souza, Textbook of Biomechanics & Kinesiology- Jaypee Brothers, 1st Edition, 2022.
5. Katrin Kroemer Elbert, Henrike B. Kroemer, Anne D. Kroemer Hoffman, Textbook of Ergonomics. ISBN, Third Edition, 2018.
6. Gavriel Salvendy Waldemar Karwowski, Handbook of Human Factors and Ergonomics, ISBN First Edition, 2021

VIDEO LECTURES:

1. <https://youtu.be/auogbJFitmI>
2. https://youtu.be/8IZ_w6hhpQ
3. <https://youtu.be/p2e5VBcGbcQ>
4. <https://youtu.be/UPg-3i4EnXc>
5. <https://youtu.be/TqJW2P7eehQ>

WEB RESOURCES:

1. <https://www.sciencedirect.com/journal/clinical-biomechanics>
2. <https://fadavispt.mhmedical.com/content.aspx?bookid=2148§ionid=162869570>
3. http://www.lavoisier.eu/books/medicine/clinical-kinesiology-andbiomechanics/description_4849221
4. <https://journals.indexcopernicus.com/issues/21690/72183>
5. <https://www.letpub.com/index.php?journalid=1797&page=journalapp&view=detail>
6. <https://journals.physiology.org/journal/jn>
7. <https://www.frontiersin.org/articles/10.3389/fneur.2021.770791/full>
8. <https://www.mdpi.com/2077-0383/11/14/4184>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202004	ADVANCED PHYSIOTHERAPEUTIC-I	3	-	2	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion about the knowledge of electrotherapy modalities, their configurations, Methods of application, Clinical decision making with the evidence based practice, and updating the recent advances in the field of Electrotherapy.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Apply superficial heat and cold modalities and its recent advances in Physiotherapy treatment.
- CO2.** Understand the low-frequency and medium-frequency currents, their physiological and therapeutic effects, and theories of pain.
- CO3.** Understand the High-frequency currents, their physiological and therapeutic effects, and recent advances in High-frequency currents.
- CO4.** Apply High-frequency currents with proper decision-making based on the evidence.

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	2	-	1	3	-	-
CO2	3	2	1	-	-	2	-	1	3	-	-
CO3	3	1	-	-	-	2	-	1	3	-	-
CO4	3	3	2	-	-	2	-	1	3	-	-
Course Correlation Level	3	2	2	-	-	2	-	1	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module1: MOIST HEAT THERAPY SUPERFICIAL HEATING AND COLD MODALITIES. (10 Periods)

Cryotherapy application effects and techniques, aquatic therapy whirlpool therapy, and clinical assessment and case study. Hydrotherapy – physical properties of water effects of hydrotherapy, uses, adverse effects, application techniques, and benefits clinical case study. Moist heat therapy– effects of heat, uses of heat, advanced application techniques, clinical case study. Fluidotherapy– Fluid therapy is a high intensity, heat modality, and effects of the fluid therapy, paraffin bath therapy, positive effects on muscle strength, and functional status, contrast bath and Hot packs

Module2: MODALITIES OF LOW FREQUENCY CURRENT AND MEDIUM FREQUENCY CURRENT EVIDENCE BASED PRACTICE PAIN (12 Periods)

Inferential therapy- medium frequency and low frequency current, and recent advance treatment. Faraday current, Galvanic current Russian currents, Di dynamic currents , sinusoidal currents, Rheo- based type Current , Transcutaneous Electrical Nerve Stimulation (TENS), Electrical stimulation, Functional electrical simulations, neuromuscular electrical simulation, high voltage pulsed galvanic stimulation, micro-current therapy, Pain – Mechanism of Pain, types of pain , theories of pain, pain gate control theory, Behavior of pain, modulation of pain and Clinical case study and electro diagnostic test SD curve ,FG test,H-wave test.

Module3: MODALITIES OF HIGH FREQUENCY CURRENT (13 Periods)

SWD: short wave Frequency and wavelength of SWD (pulsed and continuous). Micro Wave Diathermy, Wave length and frequency and advanced application methods MWD pulsed and continuous. Iontophoresis advance clinical application methods. IRR techniques and Methods of application, infra-red radiation wavelength & parameters. UVR ultraviolet radiation generators: Kromayer lamp, Fluorescent tube, continuous passive motion CPM. shockwavetherapy, combinationtherapy, magneto therapy, Muscle strengthening and prevention of atrophy, muscle spasm, pelvic floor dysfunction.

Module4: MODALITIES OF HIGH FREQUENCY CURRENT AND MECHANICAL MODALITIES (10 Periods)

Ultrasound: introduction, effects, clinical applications, adverse effects, application techniques clinical case studies, Treatment Dosage parameters: Continuous& Pulsed mode, Intensity, US Field. Extracorporeal short wave therapy, LASER: Define LASER, Introduction to electromagnetic radiation, and laser effects Types of LASERS. Principles of Production, Methods of application technique, clinical case study. Traction– effects of spinal traction, adverse effects, application techniques, clinical case study. Compression – effects of external compression adverse effects, application techniques clinical case study and electronic traction, Safety considerations in electrotherapy, central nervous system lesions, peripheral nervous system lesions, and obesity.

TOTAL : 45 Periods

EXPERIENTIAL LEARNING

List of Experiments

1. Demonstrate the techniques for patient evaluation, receiving the patient, position of the patient pain, and treatment for electrotherapy.
2. Study a case technique of treatment and clinical application of superficial heat and cold therapy modalities
3. Understand the methods of low frequency and medium frequency current modalities electrical stimulation and functional stimulation evidencebased pain electro diagnostic test
4. Evaluate the clinical application of various high frequency current, evidence based clinical application.
5. Trace out the various modalities in high-frequency current and mechanical agents
6. Assessment of clinical conditions and the techniques used for the treatment and diagnostic modalities in electro therapy

RESOURCES

BOOKS

1. Low and Reed, Electrotherapy Explained, Elsevier India 4th edition,2008
2. Forster and Palastanga Clayton's Electrotherapy, , Bailliere Tindall 8th edition,2005
3. Mitra ,Handbook of Practical Electrotherapy,JAYPEE BROTHERS,1st edition,2006
4. JAGMOHAN SINGH,Textbook of Electrotherapy, Jaypee Brothers Medical Publishers,3rd edition,2017
5. Virendra Kr. Khokhar,Electrotherapy For Physiotherapists , Top Publishing 4th edition,2015
6. S. KITCHEN, Electrotherapy – Evidenced based Practice, Scribd,11thedition,200
7. Cameron: Physical agents in Rehabilitation: An Evidence Based approach, Elsevier Health science- 2022.

VIDEO LECTURES:

1. <https://youtu.be/a54Sks3apT4?si=kLXEuniozqIJxM-6>
2. <https://youtu.be/fhNV7uu1lec?si=OTP8dwE71gnhztIH>
3. <https://youtu.be/9VFt2VtpbQc?si=FivHIOgGhwkI7P0->
4. https://www.youtube.com/watch?v=w_uSsFeA_lc
5. https://www.youtube.com/watch?v=EjJ5nX_jM-w

WEB RESOURCES:

1. Jacopo martellucci electrical stimulations for pelvic floor disorders, jan 1st 2014 https://link.springer.com/chapter/10.1007/978-3-319-06947-0_4
2. Chueh-Hung Wu, in Braddom's Rehabilitation Care: A Clinical Handbook, 2018 <https://www.sciencedirect.com/topics/medicine-and-dentistry/electrotherapy>
3. Interferential Therapy INTERFERENTIAL THERAPY (IFT) INTRODUCTION The basic principle of Interferential Therapy (IFT) is to utilize the significant physiological effects of low frequency (<250pps) electrical stimulation of nerves without the associated painful and somewhat unpleasant side effects
4. Therapeutic Ultrasound – Physiopedia
5. Lambert I, Tebbs SE, Hill D, Moss HA, Davies AJ, Elliott TSJ (2000). Interferential therapy machines as possible vehicles for cross-infection. *J Hosp Infect.* 44(1), 59-64
6. Val Robertson, Alex Ward, John Low John Low Ann Reed, Electrotherapy Explained: Principles and Practice. 4th Edition. Butterworth-Heinemann,2006
7. Tim Watson, Electrotherapy: evidence-based practice. Physiotherapy essentials. 12th edition, Churchill Livingstone,2008
8. Saunders HD. Lumbar traction*. *J Ortho Sports Phys Ther.* 1979; 1(1): 36-45. (LEVEL 1A)
9. Pellecchia GL. Lumbar traction: a review of the literature. *Journal of Orthopedic& Sports Physical Therapy.* 1994 Nov;20(5):262-7. (LEVEL 1A)
10. He M.L., Xiao Z.M., Lei M., Li TS., Wu H., Liao J. Continuous passive motion for preventing venous thromboembolism after total knee arthroplasty. *Cochrane Database Syst Rev.* 2014 Jul 29;(7):CD008207.
11. Gil-González S., Barja-Rodríguez R., López-Pujol A., Berjaoui H., Fernández-Bengoia J., Erquicia J., Leal-Blanquet J., Pelfort X. Continuous passive motion not affect the knee motion and the surgical wound aspect after total knee arthroplasty. *J Orthop Surg Res.* 2022 Jan 15;17(1):25.
12. Painhealth Pain _____ Types <https://painhealth.csse.uwa.edu.au/pain-module/pain-types/> (last accessed 20.5.2020)

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202005	ADVANCED PHYSIOTHERAPEUTIC-II	2	-	2	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course gives an overview of numerous therapeutic exercises and approaches, as well as a brief outline of different manual therapy techniques to use in treating various medical problems based on evidence.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate the different therapeutic exercises.
- CO2.** Schedule the exercises for Musculoskeletal Disorders.
- CO3.** Plan the exercises for Cardio-Pulmonary Disorders.
- CO4.** Understand the exercises in special medical conditions.
- CO5.** Demonstrate various manual therapy techniques.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	3	1	-	1	-	1	3	-	3
CO2	3	2	3	-	-	1	-	2	3	-	3
CO3	3	2	3	-	-	1	-	2	-	-	3
CO4	3	2	3	-	-	1	-	2	-	-	3
CO5	3	1	3	1	-	1	-	2	3	-	3
Course Correlation Mapping	3	2	3	1	-	1	-	2	2	-	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: General Concepts Of Therapeutic Exercises (05 Periods)

Movements, Strength Training, Principles of Aerobic Exercises, Stretching, Hydrotherapy, Mobilizations and Proprioceptive Neuro Muscular Facilitation.

Module 2: Application Of Therapeutic Exercise in Musculoskeletal Disorders (05 Periods)

Soft Tissue Injuries, Fractures, Post Surgical Conditions, and an outline of the conditions of the Shoulder Joint, Elbow Joint, Wrist Joint, Hip Joint, Knee Joint, Ankle Joint, and Spinal joint.

Module 3: Application Of Therapeutic Exercises in Cardio-Pulmonary Disorders (05 Periods)

Vascular Disorders of Extremities – Arterial Disorders, Venous Disorders, Lymphatic Disorders and Exercises for the Management of Lymphoedema, Effects of exercise on cardiac function. Breathing Exercises and Ventilatory Training, Chest Mobilization Exercises, Coughing, Postural Drainage, and Management of Chronic Obstructive Pulmonary Disease and Restrictive Lung Disease, Cardiopulmonary medications and their effect on activity performance.

Module 4: Special Areas Of Therapeutic Exercises (05 Periods)

Principles of Exercise For Obstetric Patients, Plastic Surgery, Psychiatric Conditions, Spasticity and Flaccidity, Peripheral Neural Mobilization, Theories of Motor Control and Motor Learning. Exercises to improve Bladder control, Kegels Exercise, Brandt-Daroff Exercises. Concepts of Bobath approach, Brunnstroms approach.

Module 5: Manual Therapy Techniques (10 Periods)

Concepts of Mc Kenzie technique, Mulligan technique, Muscle energy technique, Taping Technique, Positional release technique, Cyriax Friction Massage, and Feldenkrais method.

Total Periods: 30

EXPERIENTIAL LEARNING

List of Experiments:

1. Peripheral Joints, Chest wall, and Spinal Joint Mobilization.
2. Stretching Exercises.
3. Breathing Exercises.
4. Manual Therapy Techniques.
5. Progressive Resistance Exercises.
6. Passive Movements
7. Postural Drainage

RESOURCES

BOOKS:

1. Carolyn Kisner: Therapeutic Exercise Foundations and Techniques, F A Davis Co, 3rd Edition, 2022.
2. Carrie M Hall: Therapeutic Exercise: Moving Towards Function; Lippincott Williams and Wilkins; 4th International Edition, 2017.
3. Robin Mc Kenzie: The Lumbar spine Mechanical Diagnosis And Therapy; Spinal Publications Newzealand, Ltd, 2nd Edition, 2003.
4. Leon Chaitow: Muscle Energy Techniques; Elsevier; 4th Edition, 2019.
5. Wayne Hing: The Mulligan concept of manual therapy. Churchill Livingstone; 1st Edition, 2014.
6. Rose Mac Donald: Taping Techniques- Principles and Practice; Butterworth-Heinemann, 2nd Edition, 2004.
7. Chris Kresge: The Feldenkrais Method- Learning Through Movement; Handspring Publishing Ltd; 1st Edition, 2021.
8. John Sharkey: The concise book of Dry Needling: A Practitioners Guide to Myofascial Trigger Point; North Atlantic Books; 1st Edition, 2017.
9. Susan B O Sullivan: Physical Rehabilitation; F A Davis; 7th Edition, 2019.
10. Michel Probst: Physiotherapy in Mental Health and Psychiatry: A scientific and Clinical based Approach; Elsevier; 1st Edition, 2017.

VIDEO LECTURES:

1. <https://youtu.be/noThZxaeJwY>
2. <https://youtu.be/pI4T1OBWspI>
3. <https://youtu.be/YvuFdJsrPqQ>
4. <https://youtu.be/QHwBN91gmYk>
5. <https://youtu.be/qn2VT7Df7no>
6. <https://youtu.be/QOTR-J2LJ3k>

WEB RESOURCES:

1. <https://www.pdfdrive.com/>
2. <https://www.physio-pedia.com/>
3. <https://nzihf.ac.nz/personal-training/exercise-principles/>
4. https://www.physio-pedia.com/Maitland%27s_Mobilisations
5. <https://en.wikipedia.org/>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202006	PHYSIOTHERAPY DIAGNOSIS AND CLINICAL DECISION MAKING	3	-	2	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on the assessment, evaluation and decision of therapeutic approach towards the Clinical conditions.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Understand the basic findings, of radiology and imaging.
- CO2.** Analyse fitness components and on-field Training Physical assessment.
- CO3.** Knowledge of Neurological, Cardiopulmonary, and Musculoskeletal Assessment tools and Decision-making on improving the quality of life
- CO4.** Work independently and in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	-	-	2	-	1	-	3	-
CO2	3	3	3	-	-	2	-	1	-	3	-
CO3	3	3	3	-	-	2	-	1	-	3	-
CO4	3	3	3	-	-	2	-	1	-	3	-
Course Correlation Level	3	3	3	-	-	2	-	1	-	3	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: GENERAL CLINICAL EXAMINATION

(08 Periods)

Study of common diagnostic and therapeutic imaging tests, X-rays, MRI ultrasounds and other images helpful to the physiotherapy profession. Clinical examination in general and detection of movement dysfunction. Principles of pathological investigations and imaging techniques related to neuromuscular, skeletal and cardiopulmonary disorders with interpretation. motor learning –motor control assessment, Assessment of pain and symptoms, sources of pain, types of pain.

Module 2: GENERAL PHYSICAL FITNESS ASSESSMENT

(07 Periods)

Master of Physiotherapy- Cardiovascular and Pulmonary

Anthropometric measurements. Assessment by physical fitness, BMI calculation, Physical fitness assessment by Range of motion, Muscle strength, Muscle power, endurance and skills, balance, agility, flexibility. Body composition, Fitness test for sports, cardiorespiratory fitness.

Module 3: NEUROLOGICAL CLINICAL ASSESSMENT AND SPECIAL TESTS (10 Periods)

Evaluation Methods, Neurological approaches, Neuromuscular taping evaluation, higher mental functions, reflexes, Neurological disorders. EMG and Biofeedback. Biophysical measurements, physiotherapy modalities, techniques and approaches. Motor control investigations and imaging techniques. Evaluation of aging. Geriatric cases and assessment- handling old patients, and their problems, physiology of aging, degenerative changes, Alzheimer, dementia, role of physiotherapy in hospital-based care. Neurological special tests and techniques, Glasgow coma scale, Modified Ashworth scale, Mini Mental status examination, APGAR score, Timed up and go test, Berg Balance scale, Nive Hole peg test, Modified Barthel index, ASIA scale, Trunk impairment Scale.

Module 4: CARDIO-PULMONARY CLINICAL ASSESSMENT AND SPECIAL TESTS (10 Periods)

Evaluation Methods, cardio-pulmonary clinical assessment, CPR. Exercise ECG testing, oxygen therapy, respiratory physiotherapy techniques, improve lung volumes, breathing techniques to clear secretions, cardiovascular changes during exercises, pulmonary circulation, ventilation-Perfusion ratio and monitoring, spirometer, Pulmonary function tests and lung volumes and capacities. Special tests and scales: Breathlessness scale a. Borg and modified Borg scale. b. Modified medical research council dyspnea scale, Edema grading, Clubbing grading, Pulse grading, Sputum grading, Chest pain scales, Glasgow coma scale, Activities of daily living- Barthel index, Pulmonary –specific outcome scale, Pulmonary functional status scale (PFSS)

Module 5: MUSCULOSKELETAL CLINICAL ASSESSMENT AND SPECIAL TESTS (10 Periods)

Evaluation Methods, Aids and appliances, external aids and adaptive self-help devices, adaptive functional devices to improve movement dysfunction, Physical disability evaluation and disability diagnosis. Evaluate the gait measuring, the limb length and body circumferences, analysis and diagnosis. Clinical decision making in electrotherapeutics. Special tests and Scales: Neck disability index scales, Temporo - mandibular disability index, Shoulder pain and disability index – SPADI, Oswestry disability index – ODI, WOMAC scale, Liver pool elbow score, Roland and Morris disability questionnaire, Lower extremity functional scale, Foot and ankle ability measure, DASH – Disabilities of arm shoulder, hand questionnaire

TOTAL: 45 Periods

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

- 1 Case-based discussion in physiotherapy diagnosis, CT, MRI, X-ray, and other medical images.
- 2 Health protection, assessment of health, and skill-related physical fitness.
- 3 Able to conduct patient assessment and scale as per neurological case examples and case studies and physiotherapy modalities, geriatrics handling old age patients in physiotherapy in hospitals.
- 4 Cardioclinical assessment case evaluation, ECG testing, spirometry, respiratory techniques, changes during exercises, and breathing techniques.
- 5 Myofascial techniques, musculoskeletal aids, and appliances, functional devices, the gait measuring the limb length.

RESOURCES

BOOKS:

1. Gopal nambi s, A practical Guide on physiotherapy assessment for physiotherapy students” JP medical publishers, 1st edition (2017).
2. Dr A.K. Uppal , Scientific Principles of sports training, friends publications, (2017)
3. Thomas H. Berquist , Imaging of sports injuries. , Aspen publishers, 1st edition, 1992
4. SusanEdwards,Neurological physiotherapy-a problem solving approach, churchcillivingstone, 2nd edition (2001)
5. MichaelJ.G.Harrison, Clinical skills in neurology, butterworthheinemann publisher, 2nd edition (1996)
6. JenniferA.Pryor, physiotherapy for respiratory and cardio problems- adults and paediatrics, Elsevier health publisher, 4nd edition, 2013
7. Donnafrownfelter Cardiovascular andPulmonary physical therapy- evidence to practice, Mosby publishers, 5th edition, 2012.

VIDEO LECTURES:

1. <https://www.youtube.com/watch?v=1afP6eGfIR8>
2. https://www.youtube.com/watch?v=E44W54z_Ykw
3. <https://www.youtube.com/watch?v=gaiCtdo6CLE>
4. https://www.youtube.com/watch?v=fcN37TxBE_s
5. <https://youtu.be/VcCAHbiEcZo?si=bUmruUh35i8cPiqt>
6. https://www.youtube.com/live/WIUsBtj-q_s?si=A3dCSn6MWE-OX9

WEB RESOURCES:

1. Narayan, K Kar, S Gupta, N. From 'Paramedics' to 'Allied Health Professionals': Landscaping the Journey and Way Forward. Public Health Foundation of India: New Delhi, India, 2012.
2. Standards of practice for ACT Allied Health Professionals 2005. Available from: <http://health.act.gov.au/c/health?a=dlpubpoldoc&document=863>.
3. PhysioPedia

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201003	Sports for fitness, Prosthetics, and Orthotics	4	-	-	-	4
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course gives an overview of different exercises, Principles of training and Physiological changes in training the individuals for fitness. Essentials of Orthoses and Prosthesis in rehabilitation.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Apply the concepts of exercise physiology, Nutrition, and training for fitness.
- CO2.** Understand the adaptations to training and design relevant training plans.
- CO3.** Knowledge on optimization of the performance and effects of ergogenic aids on performance.
- CO4.** Analyse and apply the recent advances in orthosis and prosthesis management.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	3	1	-	1	-	1	1	-	3
CO2	3	2	3	1	-	1	-	2	1	-	3
CO3	3	2	3	1	-	1	-	2	1	-	3
CO4	3	2	3	1	-	1	-	2	1	-	3
Course Correlation Mapping	3	2	3	1	-	1	-	2	1	-	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Fitness and Nutrition

(15 Periods)

Methods of Program evaluation- Field testing, Principles of Training- Specificity, overload, progression, individuality, adaptation, and reversibility. Importance of Nutrition macro and micronutrients in the training.

Module 2: Adaptations to training

(15 Periods)

Master of Physiotherapy- Cardiovascular and Pulmonary

Resistance training and gains in muscle fitness, Adaptations to aerobic and anaerobic training, resistance training programs, anaerobic and aerobic power training program, muscle soreness and cramps, resistance training for special population.

Module 3: Optimizing performance

(15 Periods)

Optimizing training, overtraining, tapering for peak performance, detraining. Ergogenic aids and sport- pharmacological, hormonal, physiological, and nutritional agents

Module 4: Orthosis and Prosthesis

(15 Periods)

Introduction to prosthetics and orthotics- types, indications, and contraindications. Evaluation for deformities, Rationale for prescription of Prosthetics and orthotics, recent advances.

Total Periods: 60

EXPERIENTIAL LEARNING

1. Carbohydrate loading and performance.
2. Importance of Stretching Exercises in sports.
3. Reaction time in sports performance.
4. Recent literature on Micronutrients and performance.
5. Progressive Resistance Exercises.

RESOURCES

BOOKS:

1. Daniel D Arnheim: Arnheims principles of athletic training, McGraw-Hill higher education, 3rd Edition, 2002.
2. Tudor O. Bompá: Periodization theory and methodology of training; Human kinetics; 6th Edition, 2018.
3. Wilmore: Physiology of sport & Exercise. Human Kinetics publishers; 8th Edition, 2021..

VIDEO LECTURES:

1. https://youtu.be/srevC5ICT_s
2. <https://youtu.be/317W2zrQh-M>
3. <https://youtu.be/2CxEhg50oCI>
4. <https://youtu.be/fIGX9yyPRiE>
5. <https://youtu.be/x8H3SRq1L8w>
6. <https://youtu.be/Ywny2RH1NdQ>

WEB RESOURCES:

1. <https://www.pdfdrive.com/>
2. <https://www.physio-pedia.com/>
3. <https://nzihf.ac.nz/personal-training/exercise-principles/>
4. [https://www.physio-pedia.com/Maitland%27s Mobilisations](https://www.physio-pedia.com/Maitland%27s_Mobilisations)
5. <https://en.wikipedia.org/>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211002	CLINICAL TRAINING-II	-	-	-	-	6

Pre-Requisite - 22PT211001- CLINICAL TRAINING-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides assessing & evaluating the patient and advising appropriate treatment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Assess the patient illness by proper examination.
- CO2.** Identify the patient clinical condition and advise appropriate physiotherapy treatment.
- CO3.** Work individually and in teams following ethical practice.
- CO4.** Record the clinical studies for future advancements.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	-	-	-	3	-	-
CO2	3	1	3	-	-	-	-	-	-	3	3
CO3	-	-	-	3	3	-	-	-	-	-	-
CO4	3	1	-	-	3	3	-	2	-	-	-
Course Correlation Mapping	3	2	2	3	3	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Clinical Training-II -**6 Credits**.

Clinical Training-II -3 Hours/day.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211006	LITERATURE REVIEW AND TEACHING-II	-	-	-	-	1

Pre-Requisite - 22PT211005- LITERATURE REVIEW AND TEACHING-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with presentations on recent advancements and teaching for under-graduate students.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO3.** Formulate problem based on the review program specific literature on a chosen topic.
- CO4.** Demonstrate teaching capabilities on discipline specific topics at under graduate level.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	-	-	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Applicable to Literature Review and Teaching–II-1 Credit.

Literature Review and Teaching–II- 1 Hour/Week

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202013	CARDIOVASCULAR AND PULMONARY BASIC SCIENCE	4	-	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion of anatomical structures, physiology, biomechanics and pathology of cardiopulmonary

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Demonstrate and evaluate the embryonic stages functions of cardiopulmonary and respiratory system.
- CO2** Analyze and evaluate the Patho mechanics of cardiopulmonary and respiratory system.
- CO3** Trace and assess the patient by the mechanics and mechanism of breathing and cough reflex.
- CO4** Work independently and in teams to solve problems with effective communications.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	-	-	2	-	1	3	1	1
CO2	3	2	3	-	-	2	-	1	3	2	1
CO3	3	3	3	-	-	2	-	1	3	3	1
CO4	3	2	2	-	-	2	-	1	1	1	1
Course Correlation Mapping	3	3	3	-	-	2	-	2	3	3	1

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Cardiovascular Anatomy and Physiology (10 Periods)

Embryology: Development of cardiovascular system and fetal circulation

Cardiovascular Anatomy: Review of cardiovascular anatomy with its neural, vascular and autonomic nervous structures, Changes occurring with growth, effects of ageing, changes seen during pregnancy

Cardiovascular Physiology: Properties of cardiac muscles and cardiac cycle; Heart sounds, cardiac output, haemodynamic; Arterial, venous, capillary pressure; Circulatory shock; Cardiovascular adjustments during exercises

Module 2: Cardiovascular Patho mechanics (15 Periods)

Pathomechanics related to cardiac conditions : Congenital heart disease, Valvular heart disease, Rheumatic heart disease, Ischemic heart disease, Hypertrophy of heart, Cardiac failure, Pericarditis, Cardiac tumors

Patho mechanics related to vascular conditions : Arterial , Venous , Lymphatic

Module 3: Respiratory Anatomy and Physiology (10 Periods)

Embryology: Development of respiratory system

Respiratory Anatomy: Review of respiratory anatomy with its neural, vascular and nervous structures

Respiratory Physiology : Physiology of respiratory tract - Inspired air, alveolar air and expired air mechanics, Mechanics of ventilation, Pulmonary function test, Exchange transport of respiratory gases, High altitude and deep sea physiology

Module 4: Respiratory Patho mechanics (25 Periods)

Mechanics and Patho mechanics related to respiratory system : Biomechanics of thorax cage with ribs and vertebra ; Patho mechanics in scoliosis, kyphosis, pectus excavatum, pectus carinatum, flail chest, fracture of ribs, vertebra and sternum.

Patho mechanics in paediatric conditions : asthma, birth asphyxia, bronchopulmonary dysplasia, ARDS, Respiratory Syndromes, bronchial stenosis, Cystic fibrosis, pertussis.

Patho mechanics in Adult conditions : Obstructive conditions- Bronchitis, emphysema and asthma; Restrictive conditions- Pleural effusion, pleuritis, pneumothorax, hydropneumothorax, pneumonia ; Infective lung diseases- Tuberculosis ; Occupational lung diseases- All interstitial lung diseases including silicosis, asbestosis etc.

Mechanics and mechanism of breathing and cough reflex; Respiratory failure.

Total Periods: 60 Hours

EXPERIMENTAL LEARNING

LIST OF EXPERIMENTS:

- 1 Discuss development of the heart in fetus, fetal circulation, anatomical aspects of cardiac events, neural control, factors influencing circulation.
- 2 Analyze the mechanics of thorax cage with ribs and vertebra, identify Patho mechanics in diseased condition and its implications on function
- 3 Examine and analyze anatomical basis of various clinical cardiovascular conditions.
- 4 Investigate signs of circulatory failure in patients with cardiac disorders, identify abnormality in heart rate and rhythm
- 5 Assess the abnormalities of circulation of the heart, arterial, venous and lymphatic systems, function in health and disease and physiological changes due to ageing.

REFERENCE:

1. Eleanor Main, Linda Denchy: Cardiorespiratory physiotherapy Adults and Paediatrics 5th Edition, ELSEVIER publisher 2016.
2. Susan O'Sullivan, Thomas J. Schmitz & George D. Fulk: physical Rehabilitation, Davis Plus Publisher, 6th Edition, 2014.
3. Gitesh Amrohit: The Pocketbook of Chest Physiotherapy Jaypee, Brothers Medical Publisher, 2nd Edition, 2010.
4. Thomas W. Rowland: Cardiopulmonary Exercise Testing in Children and Adolescents. Human Kinetics , 2nd Edition, 20184
5. Alfred P. Pishman & Jack A. Elias: Fishman's Pulmonary diseases and disorders volume 1&2 ,Mc Graw Hill Medical Publisher, 4th Edition, 2008.
6. Patricia A. Downie Fcsp: Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists ,Jaypee Brothers Publisher, 4th Edition 1987.
7. Jennifer A. Pryor and Barbara A. Webber: Physiotherapy for Respiratory and Cardiac Problems and Churchill Livingstone Publisher, 3rd Edition, 1998.
8. Donna Frownfelter & Elizabeth, Dean, Principles And Practice of of Cardiopulmonary physical Therapy, Mosby Publisher, 3rd Edition, 1996.
9. Ellen Hillegass Essentials of Cardiopulmonary physical Therapy, Elsevier Saunders Publisher, 3d Edition, 2011.
10. Robert M. Kaczmarek, James K. Stoller & Albert, Heuer: Egan's Fundamentals of Respiratory Care ,Elsevier Publisher, 11th Edition 2017.

11. Alexandra Hough: Physiotherapy in Respiratory Care, nelson thornes Publisher, 3rd Edition, 2001.
12. Charles Vi Pollack: Differential Diagnosis of Cardiopulmonary Disease Springer Publisher, 2nd Edition, 2019.
13. W. Darlene Reid and Frank Chung :Clinical Management Notes and Case Histories in Cardio pulmanary physical Therapy Slack Publisher, 3rd Edition, 2004.
14. ML Kulkarni, Paediatric Cardiology, Jaypee Brothers Publisher, 2nd Edition, 2003.

VIDEO LECTURES:

1. <https://youtu.be /Ze7Y028wwao?feature=shared>
2. https://youtu.be/JCm _EfQWDCc?feature=shared
3. https://youtu.be /0fVoz4V75_E?feature=shared
4. <https://youtu.be/28CYhgjrBLA?feature=shared>
5. <https://youtu.be/1TKiOzmHIEo?feature=shared>
6. <https://youtu.be/X3BCFOIk1oQ?feature=shared>
7. <https://youtu.be/FKJr5uqPv5s?feature=shared>
8. <https://youtu.be/AoapGyaRBwQ?feature=shared>
9. <https://youtu.be /uLtueVyNJ9Y?feature= shared>
10. <https://youtu.be/vbEry4kZnTY?feature=shared>
11. <https://youtu.be/6bkjJWBBnCo?feature=shared>
12. <https://youtu.be /J3TvcdgEMN4?feature=shared>

WEB RESOURCES:

1. www.ncbi.nlm.nih.gov
2. www.ncbi.nlm.nih.gov
3. <https://my.clevelandclinic.org>
4. <https://my.clevelandclinic.org>
5. <https://www.physio-pedia.com>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202014	CARDIOVASCULAR, PULMONARY ASSESSMENT AND EVALUATION	4	-	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion of assessing the patient of cardiopulmonary.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Demonstrate and evaluate the patient condition based on the measurements, documentation and investigations.
- CO2** Analyze and evaluate the patient with special test.
- CO3** Assessing the patient complete body by subjective and objective.
- CO4** Work independently and in teams to solve problems with effective communications.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	1	1	-	-	-	2	1	2	-
CO2	3	2	1	1	-	-	-	2	1	3	-
CO3	3	3	1	1	-	-	-	2	1	3	-
CO4	3	3	1	1	-	-	-	2	1	3	-
Course Correlation Mapping	3	2	3	1	-	-	-	2	1	3	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: General Assessment of Cardiopulmonary

(10 Periods)

Measurements and Documentation: -

Measurements: Types of measurements. Selecting measurements, performing measurements. Interpreting measurements.

Documentation: Purpose of documentation, Types of documentation, General guidelines for content and organization.

1) objective information ii) subjective information iii) assessment, iv) plan V) summary

History of illness, past medical history, present medical history, occupational history, social history, history of personal habits (smoking), family history, physiotherapy treatment history.

Module 2: Evaluation of Cardio pulmonary

(15 Periods)

GENERALCARDIOVASCULAREVALUATION: Inspection: Chest Wall Deformities, Respiratory Pattern, cyanosis, Clubbing; Palpation: Edema; Auscultation: The stethoscope, Nomenclature & interpretation of heart sound, the examination technique of Gallops and murmurs.

Electrocardiogram: Leads, Tracing& Recording the ECG, Evaluating ECG Scripts, Interpreting normal ECG. Examination of heart rate, evaluation of rhythms. Interpreting abnormal ECG findings related to cardiac problems. ECG stress testing

GENERAL RESPIRATORY EVALUATION: History, chest examination; Components of chest examination

Inspection: Evaluation of general appearance, topographical anatomic land marks, Specific evaluation of head and neck, Chest wall configuration, chest wall deformities, Evaluation of unmoving chest, Evaluation of moving chest, Breathing pattern, Anemia, Cyanosis, Clubbing, Respiratory pattern

Auscultation: The stethoscope, Nomenclature& interpretation of breath sounds, The examination technique, Interpretation of examination; Palpation: Evaluation of media sternum and tracheal deviation, Evaluation of chest wall expulsion, Evaluation of fremitus, Evaluation of scalene muscles, Evaluation of chest pain, Evaluation of diaphragmatic movement, Evaluation of edema.

Mediate percussion: Evaluation of lung density, Evaluation of diaphragmatic excursion.

Module 3: Investigations of Cardio pulmonary

(15 Periods)

LABORATORY EVALUATION: Arterial blood gases, assessment of acid-base balance, Blood Gas Interpretation, Factors affecting arterial blood gases; Pulmonary function tests (PFT), spirometry, Dead space, lung volumes, lung capacities, airflow measurements, tests of forced expiration (PEFR), (FEV1) flow volume curves, flow volume loops, closing volume, airway closure, maximal voluntary ventilation, Guidelines for interpretation of PFT. Diagnosis of restrictive and Obstructive lung diseases with the help of PFT; Exercise testing: 12 Minute walking test. Bergs PRE test

Chest Radiography, Principles of chest x-ray interpretation; Guidelines for interpretation of abnormal chest radiograph; Bacteriological and Cytological Test, Clinical significance and test results, Multisystem Assessment and Laboratory Investigations: Blood, pulmonary function, cardiac function, peripheral vascular function, kidney function, endocrine function, Pancreatic function, immunological function

Module 4: Evaluation of monitored stimulation

(10 Periods)

Low Level Exercise Testing: Purpose, Contra-indications, Termination points Maximal Exercise Testing

Maximal exercise testing: Purpose, Guidelines, Exercise Test Protocols, Contraindications and precautions, Criteria for termination of test, Prognostic implications from exercise testing, exercise prescription and activity recommendation based on maximal exercise test results, interpretation of maximal exercise test result.

Exercise Tolerance Test or Stress test METS and their use in evaluation,

Evaluation of Peripheral Vascular Disorders: Arterial Evaluation, Venous Evaluation, Lymphatic Evaluation

Cardiopulmonary Evaluation in Intensive Care Unit.

Cardiopulmonary Evaluation of Ventilatory Dependent Patient.

Respiratory rate respiratory pattern pulse rate, Temperature, Blood Pressure Fluid and Electrolyte Balance; Chest Tube Drainage and fluid collection system. Arterial blood gas analysis. ECG monitoring, Intra-arterial lines, Pulmonary artery balloon flotation catheter, Intravenous line, Central Venous Pressure, Intra-aortic balloon Counter pulsations, Interpolations, Electroencephalogram.

Module 5: Special Tests of Cardiopulmonary

(10 Periods)

SPECIAL TESTS: Cardiac scans, PET scans, infarct avid scans. Pulmonary scans, Perfusion scan, Ventilation Scan, ECHO Cardiography, Angiography, Interpretation of results.

Physiotherapy evaluation of Respiratory conditions, Physiotherapy Evaluation of Cardiac conditions pre-operative evaluation of pulmonary surgeries, Post Operative evaluation of Pulmonary surgeries pre-operative evaluation of Cardiac Surgeries, Post Operative evaluation of Cardiac Surgeries. Recent developments in physiotherapy evaluation of cardiorespiratory conditions: Clinical measurement of cardiorespiratory fitness in cancer patients, Evaluation of cancer complication like lymphedema musculoskeletal, neurological, cardio respiratory, Exercise and cancer related fatigue and its evaluation.

Total Periods: 60 Hours

Experimental Learning:-

LIST OF EXPERIMENTS:

1. Analyze structural, functional impairment, evaluate physical and cardio-respiratory function of patients in the critical care unit.
2. Assess and analyze impairments of people with obstructive and restrictive respiratory disorders.
3. Apply knowledge of basic investigative approaches in the medical system & surgical intervention regimes related to respiratory impairment in forming a functional diagnosis.
4. Evaluate PFT with respect to obstructive and restrictive disorders on basis of FEV₁,FVC, FEV₁/FVC ratio, small airway function
5. Discuss the abnormal ECG findings related to different cardiac condition.

Reference:

1. Susan O'Sullivan, Thomas J. Schmitz & George D. Fulk: physical Rehabilitation, Davis Plus Publisher, 6th Edition, 2014.
2. Gitesh Amrohit: The Pocketbook of Chest Physiotherapy Jaypee, Brothers Medical Publisher, 2nd Edition, 2010.
3. Thomas W. Rowland: Cardiopulmonary Exercise Testing in Children and Adolescents. Human Kinetics , 2nd Edition, 2018.
4. Alfred P. Pishman& Jack A. Elias: Fishman's Pulmonary diseases and disorders volume 1&2 ,Mc Graw Hill Medical Publisher, 4th Edition, 2008.
5. Patricia A.Downie Fcsp: Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists ,JAYPEE BROTHERS Publisher, 4th Edition 1987.
6. Jennifer A. Pryor and Barbara A. Webber: Physiotherapy for Respiratory and Cardiac Problems and Churchill Livingstone Publisher, 3rd Edition, 1998.
7. Donna Frownfelter & Elizabeth, Dean, Principles And Practice of of Cardiopulmonary physical Therapy, Mosby Publisher, 3rd Edition,1996.
8. Ellen Hillegass Essentials of Cardiopulmonary physical Therapy, Elsevier Saunders Publisher, 3d Edition, 2011.
9. Robert M. Kaczmarek, James K. Stoller & Albert, Heuer: Egan's Fundamentals of Respiratory Care ,Elsevier Publisher, 11th Edition 2017.
10. Alexandra Hough: Physiotherapy in Respiratory Care, nelson thornes Publisher, 3rd Edition, 2001.

VIDEO LECTURES:

1. <https://youtu.be/03qvN5pjCTU?feature=shared>
 2. <https://youtu.be/TPe76uMBRjg?feature=shared>
 3. <https://youtu.be/iBuyuzb8s2A?feature=shared>
 4. <https://youtu.be/RAXvu11Jj7o?feature=shared>
 5. <https://youtu.be/vx2gb488Hvw?feature=shared>
- Master of Physiotherapy- Cardiovascular and Pulmonary

WEB RESOURCES:

1. www.ncbi.nlm.nih.gov
2. <https://www.researchgate.net>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://www.physio-pedia.com>
5. <https://www.sciencedirect.com>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211003	CLINICAL TRAINING-III	-	-	-	-	8

Pre-Requisite - 22PT211002 - CLINICAL TRAINING-II

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides assessing & evaluating the patient and advising appropriate treatment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- C05.** Assess the patient illness by proper examination.
- C06.** Identify the patient clinical condition and advise appropriate physiotherapy treatment.
- C07.** Work individually and in teams following ethical practice.
- C08.** Record the clinical studies for future advancements.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	-	-	-	3	-	-
CO2	3	1	3	-	-	-	-	-	-	3	3
CO3	-	-	-	3	3	-	-	-	-	-	-
CO4	3	1	-	-	3	3	-	2	-	-	-
Course Correlation Mapping	3	2	2	3	3	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Clinical Training-III -**8 Credits**.

Clinical Training-III -5 Hours/day.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211007	LITERATURE REVIEW AND TEACHING-III	-	-	-	-	1

Pre-Requisite - 22PT211006- LITERATURE REVIEW AND TEACHING-II

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with presentations on recent advancements and teaching for under-graduate students.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Formulate problem based on the review program specific literature on a chosen topic.
- CO2.** Demonstrate teaching capabilities on discipline specific topics at under graduate level.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	-	-	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Applicable to Literature Review and Teaching–III-1 Credit.

Literature Review and Teaching–III- 1 Hour/Week

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22AB211001	COMMUNITY CAMP – I	-	-	-	-	1

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with community physiotherapy includes community-based rehabilitation for disabled, incorporating physical activity and education for people with chronic conditions, women’s health, geriatric health. Awareness on physiotherapy in enhancing quality of life.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the importance of physiotherapy at community level in enhancing the quality of life.

CO2. Knowledge on prevention and health promotion of communicable diseases.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	1	1	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201010	Clinical Cardiovascular and Pulmonary	5	-	-	-	5

Pre-Requisite - 22PT202014-Cardiovascular, Pulmonary Assessment and Evaluation

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion about cardio-thoracic conditions and cardio-thoracic pathology.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Knowledge and Understand about the cardiac conditions and respiratory conditions
- CO2** Assessing the cardiopulmonary conditions and advances in the Medical and Surgical Management
- CO3** Analyze and evaluate the patient with the cardiopulmonary conditions and advances in the Medical and Surgical Management

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	1	-	1	3	1	1
CO2	3	2	2	1	-	1	-	1	3	1	1
CO3	3	2	2	1	-	1	-	1	3	1	1
Course Correlation Mapping	3	2	2	1	-	1	-	1	3	1	1

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Cardiovascular Medical Conditions (20 Periods)

Definitions, causes, clinical features, pathophysiology, general investigations (blood test, serum, creatinine etc.), Medical and surgical management of the below mentioned conditions-

Pediatric Cardio-vascular disorder: Fallot's tetralogy, Co-actuation of aorta, Patent ductus arteriosus, Arterial septal defect, ventricular septal defect, Transposition of great vessels.

Acquired heart diseases: Coronary Artery Diseases, Cardiac arrhythmias, Valvular heart diseases, Cardio-myopathies, Myocardial infarction, Hypertension and diabetes, Diseases of the myocardium, Pericardial diseases, Tumors of the heart.

Peripheral vascular diseases: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases: Arteriosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins; Cardiac arrest/ failure.

Module 2: Cardiovascular Surgical Conditions (20 Periods)

Cardiovascular surgeries: Open heart surgery, closed heart surgery, minimally invasive surgeries, angioplasty, CABG, repairs, vascular surgeries, pacemaker implantation, Ventricular assist devices, heart transplantation, recent advances.

Module 3: Respiratory Medical Conditions (20 Periods)

Definitions, causes, clinical features, pathophysiology, general investigations (blood test, serum, creatinine etc.), Medical and surgical management of the below mentioned conditions-

Obstructive lung disease: Asthma, Chronic bronchitis, emphysema, Bronchiectasis, Cystic fibrosis, etc.

Restrictive lung disease: Atelectasis, pneumonia, Pleural effusion, Pneumothorax, ARDS

Suppurative lung disease: lung abscess

Occupational lung diseases: occupational asthma, inhalation injuries, etc.

Chest trauma, Chest wall deformities, Lung cancers, Paediatric/Neonatal Pulmonary diseases; Sleep apnoea; Respiratory failure.

Module 4: Respiratory Surgical Conditions (15 Periods)

Respiratory surgeries: Pulmonary resection, Pleurectomy, Lobectomy/Bulbectomy, window operation, decortications, rib resection, wedge or segmental resection, thoracotomy, thoracoplasty, lung transplantation, recent advances.

Total Periods: 75 Hours

EXPERIMENTAL LEARNING:

LIST OF EXPERIMENTS:

1. Discuss the concepts of cardio-pulmonary surgeries, assessment and management following different surgical techniques in respiratory conditions.
2. Describe concepts of cardio-pulmonary surgeries, assessment and management following different surgical techniques in cardiovascular conditions.
3. Analyze the recent advances related physical therapy management in cardio-pulmonary surgical conditions.
4. Assess the surgical patients in clinical setup and institute physiotherapy.
5. Apply pre-operative physiotherapy assessment and management techniques to optimize post-surgical functional ability

REFERENCE:

1. Eleanor Main, Linda Denchy: Cardiorespiratory physiotherapy Adults and Paediatrics, Elsevier publisher, 5th Edition, 2016.
2. Susan O'Sullivan, Thomas J. Schmitz & George D. Fulk: physical Rehabilitation, Davis Plus Publisher, 6th Edition, 2014.
3. Gitesh Amrohit: The Pocketbook of Chest Physiotherapy Jaypee, Brothers Medical Publisher, 2nd Edition, 2010.
4. Thomas W. Rowland: Cardiopulmonary Exercise Testing in Children and Adolescents. Human Kinetics , 2nd Edition, 2018.
5. Alfred P. Fishman & Jack A. Elias: Fishman's Pulmonary diseases and disorders volume 1&2 ,Mc Graw Hill Medical Publisher, 4th Edition, 2008.
6. Patricia A. Downie Fcsp: Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists ,JAYPEE BROTHERS Publisher, 4th Edition 1987.
7. Jennifer A. Pryor and Barbara A. Webber: Physiotherapy for Respiratory and Cardiac Problems and Churchill Livingstone Publisher, 3rd Edition, 1998.
8. Donna Frownfelter & Elizabeth, Dean, Principles And Practice of of Cardiopulmonary physical Therapy, Mosby Publisher, 3rd Edition, 1996.
9. Ellen Hillegass Essentials of Cardiopulmonary physical Therapy, Elsevier Saunders Publisher, 3d Edition, 2011.

10. Robert M. Kaczmarek, James K. Stoller & Albert, Heuer: Egan's Fundamentals of Respiratory Care, Elsevier Publisher, 11th Edition 2017.
11. Alexandra Hough: Physiotherapy in Respiratory Care, nelson thornes Publisher, 3rd Edition, 2001.
12. Charles V Pollack: Differential Diagnosis of Cardiopulmonary Disease Springer Publisher, 2nd Edition, 2019.
13. W. Darlene Reid & Frank Chung: Clinical Management Notes and Case Histories in Cardio pulmanary physical Therapy, Slack Publisher, 3rd Edition, 2004.
14. ML Kulkarni, Paediatric Cardioogy, Jaypee Brothers Medical Publishers, 2nd Edition, 2003.
15. GB Madhuri: Textbook of for Cardio-respiratory, Physiotherapy for Cardiac Surgery and Thoracic Surgery Conditions, Jaypee Brothers Medical Publishers, 2nd Edition, 2008
16. Subin Solomen & Pravin Aaron: Techniques in Cardiopulmonary physiotherapy, Peepee Publishers, 2018.

VIDEO LECTURES:

1. <https://youtu.be/03qvN5pjCTU?feature=shared>
2. <https://youtu.be/TPe76uMBRjg?feature=shared>
3. <https://youtu.be/vx2gb488Hvw?feature=shared>
4. https://youtu.be/_1AQsrrYHpDM?feature=shared
5. <https://youtu.be/cSJxstCVITY?feature=shared>
6. https://youtu.be/_cCPyWFK0IKs?feature=shared
7. https://youtu.be/_WSi42C9Nzv8?feature=shared
8. https://youtu.be/_ITCF8y7e1Bw?feature=shared
9. https://youtu.be/_qogBXXddCbK?feature=shared
10. https://youtu.be/_NpgmPs5B3f4?feature=shared
11. https://youtu.be/g4Y2DWc_-80c?feature=shared

WEB RESOURCES:

1. <https://www.thoracic.org>
2. <https://www.who.int>
3. <https://www.brighamandwomens.org>
4. <https://my.clevelandclinic.org>
5. <https://training.seer.cancer.gov>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT202015	CARDIOVASCULAR AND PULMONARY PHYSIOTHERAPY INTERVENTIONS	4	-	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion of physiotherapy treatment of cardiopulmonary diseases.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Understand and evaluate the patient condition for physiotherapy management of pre and post operative.
- CO2** Analyze the patient recovery by cardiopulmonary physiotherapy management.
- CO3** Assessing the patient condition improvement before and after physiotherapy and planning for physiotherapy treatment.
- CO4** Work independently and in teams to solve problems with effective communications.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	-	-	2	-	1	3	1	1
CO2	3	2	3	-	-	2	-	1	3	2	1
CO3	3	3	3	-	-	2	-	1	3	3	1
CO4	3	2	2	-	-	3	-	1	2	2	2
Course Correlation Mapping	3	3	3	-	-	2	-	2	3	3	1

Correlation Levels: 3: High; 2: Medium; 1: Low

Module 1: Physiotherapy interventions of cardio pulmonary (15 Periods)

Physiotherapy management of cardio pulmonary :-Artificial respiration; Exercise planning and prescription; Cardio Pulmonary resuscitation, procedures and techniques; Effects to chest physiotherapy; Adjuncts to chest physiotherapy; Physiotherapy techniques in relation with chest physiotherapy; Pediatric cardiopulmonary physiotherapy ; Vascular defects of heart and postoperative management; Risk factors in cardiopulmonary disorders ; Cardiopulmonary complications and physiotherapy management; Prescription of postoperative and physiotherapy management; Physiotherapeutic interventions for relief of pain

Module 2: Preoperative and Postoperative Conditions (15 Periods)

Preoperative and Postoperative Physiotherapy management of Cardiovascular conditions:

Pediatric Cardio-vascular disorder: Fallot's tetralogy, Co-actuation of aorta, Patent ductus arteriosus, Arterial septal defect, ventricular septal defect, Transposition of great vessels.

Acquired heart diseases: Coronary Artery Diseases, Cardiac arrhythmias, Valvular heart diseases, Cardio-myopathies, Myocardial infarction, Hypertension and diabetes, Diseases of the myocardium, Pericardial diseases, Tumors of the heart.

Peripheral vascular diseases: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases: Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.
Cardiac arrest/ failure.

Cardiovascular surgeries: Open heart surgery, closed heart surgery, minimally invasive surgeries, angioplasty, CABG, repairs, vascular surgeries, pacemaker implantation, Ventricular assist devices, heart transplantation, recent advances.

Module 3: Physiotherapy management of respiratory diseases (15 Periods)

Physiotherapy management of respiratory diseases:

Obstructive lung disease: Asthma, Chronic bronchitis, emphysema, Bronchiectasis, Cystic fibrosis, etc.

Restrictive lung disease: Atelectasis, pneumonia, Pleural effusion, Pneumothorax, ARDS

Suppurative lung diseases: lung abscess

Occupational lung diseases: occupational asthma, inhalation injuries, etc.

Chest trauma, Chest wall deformities, Lung cancers, Paediatric/Neonatal Pulmonary diseases; Sleep apnoea; Respiratory failure.

Respiratory surgeries: Pulmonary resection, Pleurectomy, Lobectomy/Bulbectomy, window operation, decortications, rib resection, wedge or segmental resection, thoracotomy, thoracoplasty, lung transplantation, recent advances.

Module 4: Physiotherapy Management of Cardio pulmonary (15 Periods)

Trauma to the chest. Lung abscess, Broncho pneumonia, Destroyed lung, Carcinoma of lung, pulmonary embolism, interstitial lung diseases. Occupational lung disorders. Management of cardiopulmonary complications in burns patient. Surgical Conditions: Thoracoplasty, Empyema thoracis, Rib Resection, Decortication Window Operation, Omentoplasty. Surgeries to thoracic wall, surgeries in Cardiac Conditions, Vascular conditions and pulmonary conditions.

Total Periods: 60 Hours

Experimental Learning: -

LIST OF EXPERIMENTS:

1. Apply the Physiotherapy techniques applicable in Cardiac ICU, Paediatric and neonatal ICUs.
2. Demonstrate clinical skills relevant to recent advances in Physiotherapy treatment techniques pertinent to pulmonary conditions.
3. Analyse precautions and risk stratification in planning exercise program for post-operative cancer patients
4. Demonstrate the different treatment techniques and apply recent evidences in patient care.
5. Discuss the pre and post-operative of lung transplantation.

REFERENCE:

1. Susan O'Sullivan, Thomas J. Schmitz & George D. Fulk: physical Rehabilitation Davis Plus Publisher, 6th Edition, 2014.
2. Gitesh Amrohit: The Pocketbook of Chest Physiotherapy, Jaypee Brothers Medical Publishers, 2nd Edition, 2010.
3. PATRICIA A. DOWNIE FCSP: Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists 4th Edition JAYPEE BROTHERS Publisher 1987.
4. Donna Frownfelter & Elizabeth, Dean, Principles and Practice of of Cardiopulmonary physical Therapy, Mosby Publisher, 3rd Edition,1996.
5. Ellen Hillegass Essentials of Cardiopulmonary physical Therapy, Elsevier Saunders Publisher, 3d Edition, 2011.
6. Robert M. Kaczmarek, James K. Stoller & Albert, Heuer: Egan's Fundamentals of Respiratory Care, Elsevier Publisher, 11th Edition 2017.

7. Alexandra Hough: Physiotherapy in Respiratory Care, Nelson Thornes Publisher, 3rd Edition 2001.
8. Jennifer A. Pryor and Barbara A. Webber: Physiotherapy for Respiratory and Cardiac Problems and Churchill Livingstone Publisher, 3rd Edition, 1998.
9. W. Darlene Reid & Frank Chung: Clinical Management Notes and Case Histories in Cardio pulmonary physical Therapy, Slack Publisher, 3rd Edition, 2004.
10. ML Kulkarni, Paediatric Cardiology, Jaypee Brothers Medical Publishers, 2nd Edition, 2003.
11. GB Madhuri: Textbook of for Cardio-respiratory, Physiotherapy for Cardiac Surgery and Thoracic Surgery Conditions, Jaypee Brothers Medical Publishers, 2nd Edition, 2008
12. Subin Solomen & Pravin Aaron: Techniques in Cardiopulmonary physiotherapy, Peepee Publishers, 2018.

VIDEO LECTURES:

1. <https://youtu.be/bE33Wmcz9zQ?feature=shared>
2. <https://youtu.be/flIV8c38zDE?feature=shared>
3. https://youtu.be/Hqe5Bk_suEA?feature=shared
4. <https://youtu.be/Q9JIZI3VGQ0?feature=shared>

WEB RESOURCES:

1. www.ncbi.nlm.nih.gov
2. <https://www.researchgate.net>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://www.physio-pedia.com>
5. <https://www.sciencedirect.com>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201009	CARDIOVASCULAR AND PULMONARY REHABILITATION	4	-	-	-	4
Pre-Requisite	- 22pt201015 - Cardiovascular And Pulmonary Physiotherapy Interventions					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion of physiotherapy treatment of cardiopulmonary diseases.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- C01** Understand and Evaluate the Conservative Management of Cardiac and Respiratory Rehabilitation.
- C02** Analyze the Physiotherapy Management of Cardiac and Respiratory Rehabilitation.
- C03** Assessing the patient condition improvement before and after physiotherapy and planning for physiotherapy treatment.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	2	2	2	-	-	-	2	2	2	-
CO2	3	2	1	2	-	-	-	2	2	3	-
CO3	3	3	1	1	-	1	-	2	2	3	-
Course Correlation Mapping	3	2	3	2	-	1	-	2	2	3	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Cardiac Rehabilitation (15 Periods)

Cardiac Rehabilitation (CR) – Rational, guidelines, goals, indications- contraindications, short term and long-term benefits, Phase I, II, III rehabilitation, outcome of CR, inter disciplinary approach and roles of individual team members

Module 2: Conservative Management of Cardiac Rehabilitation (15 Periods)

Cardiac Rehabilitation in conservatively managed patients, following angioplasty, CABG, pacemaker implantation, heart transplantation, heart failure, patients with assistive implants, patients with corrective surgeries for developmental, acquired heart diseases, vascular surgeries.

Module 3: Pulmonary Rehabilitation (15 Periods)

Pulmonary Rehabilitation (PR) – rational, guidelines, goals, indications- contraindications, short term and long-term benefits, components and methods used for pulmonary rehabilitation, outcome of PR, inter disciplinary approach and roles of individual team members

Module 4: Conservative Management of Pulmonary Rehabilitation (15 Periods)

Pulmonary Rehabilitation in conservatively managed patients, following pulmonary surgeries, chronic obstructive and restrictive diseases, lung transplantation.

TOTAL PERIODS: 60 HOURS

EXPERIMENTAL LEARNING: -

LIST OF EXPERIMENTS:

1. Demonstrate the special test for identification of specific disorder
2. Differentiate the cardiac diseases and pulmonary diseases
3. Assess the patient improvement after physiotherapy treatment
4. Evaluate the patient conditions after post operation.
5. Regular follow up of the patient before and after operation.

Reference:

13. Susan O'Sullivan, Thomas J. Schmitz & George D. Fulk: physical Rehabilitation, Davis Plus Publisher, 6th Edition, 2014.
14. Gitesh Amrohit: The Pocketbook of Chest Physiotherapy, JAYPEE BROTHERS MEDICAL PUBLISHER, 2010.
15. PATRICIA A. DOWNIE FCSP: Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists, JAYPEE BROTHERS Publisher, 4th Edition 1987.
16. DONNA FROWN FELTER & ELIZABETH, DEAN: PRINCIPLES AND PRACTICE OF CARDIOPULMONARY PHYSICAL THERAPY, Mosby Publisher, 3rd Edition 1996.
17. ELLEN HILLEGASS ESSENTIALS OF CARDIOPULMONARY PHYSICAL THERAPY, ELSEVIER SAUNDERS Publisher, 3d Edition, 2011
18. ROBERT M. KACMAREK, JAMES K. STOLLER & ALBERT J. HEUER: EGAN'S Fundamentals of Respiratory Care, ELSEVIER Publisher, 11th Edition 2017.
19. Alexandra Hough: Physiotherapy in Respiratory Care, nelson thornes Publisher 2001.
20. Jennifer A. Pryor and Barbara A. Webber: Physiotherapy for Respiratory and Cardiac Problems and CHURCHILL LIVINGSTONE Publisher, 4th Edition, 1998.
21. W. Darlene Reid & Frank Chung: Clinical Management Notes and Case Histories in Cardio pulmonary physical Therapy, SLACK Publisher, 2004.
22. ML Kulkarni PEDIATRIC CARDIOLOGY, JAYPEE BROTHERS MEDICAL PUBLISHERS, 2nd Edition, 2003.
23. GB Madhuri: Textbook of for Cardio-respiratory, - Physiotherapy for C Cardiac Surgery and Thoracic Surgery, Conditions JAYPEE BROTHERS MEDICAL PUBLISHERS, 2nd Edition, 2008
24. Subin Solomen & Pravin Aaron: Techniques in Cardiopulmonary physiotherapy PEEPEE PUBLISHERS, 2nd Edition, 2018.

VIDEO LECTURES:

1. <https://youtu.be/bE33Wmcz9zQ?feature=shared>
2. <https://youtu.be/flIV8c38zDE?feature=shared>

Master of Physiotherapy- Cardiovascular and Pulmonary

3. https://youtu.be/Hqe5Bk_suEA?feature=shared
4. [https://youtu.be /Q9JIZI3VGQ0?feature= shared](https://youtu.be/Q9JIZI3VGQ0?feature=shared)

WEB RESOURCES:

1. www.ncbi.nlm.nih.gov
2. <https://www.researchgate.net>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://www.physio-pedia.com>
5. <https://www.sciencedirect.com>

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201011	RECENT ADVANCES IN CARDIOPULMONARY PHYSIOTHERAPY	2	-	-	-	2
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion of Recent Advances physiotherapy treatment of cardiopulmonary diseases.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Demonstrate and Evaluate the Recent Advances in Exercise Testing and prescription.
- CO2** Analyze and evaluate the Neurophysiological facilitation of respiration and Proprioceptive Neuromuscular Facilitation.
- CO3** Assessing the patient condition Cardiopulmonary manual Techniques.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	1	2	1	-	-	-	2	2	2	-
CO2	3	2	2	1	-	-	-	2	2	3	-
CO3	3	2	2	1	-	-	-	2	2	3	-
Course Correlation Mapping	3	2	2	1	-	-	-	2	2	3	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Exercise Testing and prescription

(10 Periods)

Exercise Testing and prescription: Principle and technique, Patient assessment, Protocols, Exercise testing for special group

Precision heart rate training: Heart rate monitoring and training, Training in heart zones, Precision heart rate, training for specific sports, Multi Activity training, Monitoring of training effects.

Module 2: Neurophysiological facilitation of respiration (05 Periods)

Neurophysiological facilitation of respiration: Chest Mobilization, Muscle lengthening technique, Postural retraining.

Module 3: Proprioceptive Neuromuscular Facilitation (05 Periods)

Proprioceptive Neuromuscular Facilitation: Basic of chest PNF, Technique of chest PNF, Pilates for different sports.

Module 4: Cardiopulmonary manual Techniques (10 Periods)

Cardiopulmonary manual Techniques: Cardiopulmonary technique in acute condition: Techniques in pneumothorax, Pleural surgeries and techniques.

Total Periods: 30 Hours

EXPERIMENTAL LEARNING: -

LIST OF EXPERIMENTS:

1. Demonstrate the special test for identification of specific disorder
2. Differentiate the cardiac diseases and pulmonary diseases
3. Assess the patient improvement after physiotherapy treatment
4. Evaluate the patient conditions after post operation.
5. Regular follow up of the patient before and after operation.

References:

1. J. Maitland, Spinal manipulation made simple-A manual of soft tissue techniques. North Atlantic Books, 2nd Edition.2001.
2. C. J. Manheim, The Myofascial Release Manual. SLACK Incorporated, 4th Edition. 2008.
3. J. Langendoen, Kinesiology Taping the Essential Step-By-Step Guide: Taping for Sports, Fitness and Daily Life, Robert Rose Inc, 1st Edition, 2014.
4. G. Cook, Movement: Functional Movement Systems: Screening, Assessment, Corrective Strategies. Lotus Publisher, 2nd Edition, 2011.
5. N. Sweden, Women's Sports Medicine and Rehabilitation, Aspen Publishers Inc, 1st Edition, 2001.

VIDEO LECTURES:

1. <https://youtu.be/flIV8c38zDE?feature=shared>
 2. https://youtu.be/Hqe5Bk_suEA?feature=shared
 3. [https://youtu.be/Q9JIZI3VGQ0?feature= shared](https://youtu.be/Q9JIZI3VGQ0?feature=shared)
- Master of Physiotherapy- Cardiovascular and Pulmonary

4. [https://youtu.be/bE33Wmcz9zQ?feature= shared](https://youtu.be/bE33Wmcz9zQ?feature=shared)

WEB RESOURCES:

1. www.ncbi.nlm.nih.gov
2. <https://www.researchgate.net>
3. <https://www.ncbi.nlm.nih.gov>
4. <https://www.physio-pedia.com>
5. <https://www.sciencedirect>

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211004	CLINICAL TRAINING-IV	-	-	-	-	8

Pre-Requisite - 22PT21103 – CLINICAL TRAINING -III

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides assessing & evaluating the patient and advising appropriate treatment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO9.** Assess the patient illness by proper examination.
- CO10.** Identify the patient clinical condition and advise appropriate physiotherapy treatment.
- CO11.** Work individually and in teams following ethical practice.
- CO12.** Record the clinical studies for future advancements.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	-	-	-	3	-	-
CO2	3	1	3	-	-	-	-	-	-	3	3
CO3	-	-	-	3	3	-	-	-	-	-	-
CO4	3	1	-	-	3	3	-	2	-	-	-
Course Correlation Mapping	3	2	2	3	3	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Clinical Training-III –8 Credits.

Clinical Training-III -5 Hours/day.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT211008	LITERATURE REVIEW AND TEACHING-IV	-	-	-	-	1

Pre-Requisite - 22PT211007 - LITERATURE REVIEW AND TEACHING-III

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with presentations on recent advancements and teaching for under-graduate students.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO3. Formulate problem based on the review program specific literature on a chosen topic.

CO4. Demonstrate teaching capabilities on discipline specific topics at under graduate level.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	-	-	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note:

Applicable to Literature Review and Teaching-I-1 Credit.

Literature Review and Teaching-I- 1 Hour/Week

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22AB211002	COMMUNITY CAMP – II	-	-	-	-	1

Pre-Requisite - 22AB211001- COMMUNITY CAMP – I
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: This course deals with community physiotherapy includes community-based rehabilitation for disabled, incorporating physical activity and education for people with chronic conditions, women’s health, geriatric health. Awareness on physiotherapy in enhancing quality of life.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO3.** Understand the importance of physiotherapy at community level in enhancing the quality of life.
- CO4.** Knowledge on prevention and health promotion of communicable diseases.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes								Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	3	-	2	3	3	3
CO2	3	1	1	1	1	3	-	2	3	3	3
Course Correlation Mapping	3	2	2	1	1	3	-	2	3	3	3

Correlation Levels: 3: High; 2: Medium; 1: Low

Note: Applicable to Literature Review and Teaching–II & III.

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CB101703	FORENSIC SCIENCE	3	-	-	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Forensic Science, Tools and Techniques in Forensic Science, Forensic Photography, Crime Scene Management, Crime Scene Management Laws and Forensic Science.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Understand the basic concepts of Forensic science.
- CO2** Apply various tools and techniques in forensic science for crime investigation.
- CO3** Understand Forensic Photography fundamentals.
- CO4** Perform Crime scene investigation, scene reconstruction and prepare reports.
- CO5** Understand Legal aspects of Forensic Science.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3											
CO2	3	3	2	2	2							
CO3	3	3										
CO4	3	3	2	2	2							
CO5	3	3	2	2	2							
Course Correlation Mapping	3	3	2	2	2							

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION (09 Periods)

Introduction, Need, Scope, Concepts and Significance of Forensic Science, History and Development of Forensic Science, Laws and Basic principles of Forensic Science, Branches of forensic science, Organizational set-up of a Forensic Science Laboratory. Investigative strategies. Expert testimony and eye-witness report.

Module 2: TOOLS AND TECHNIQUES IN FORENSIC SCIENCE (09 Periods)

Basic principles of microscopy, spectroscopy, chromatography, Electrophoresis, Enzyme Linked Immunosorbent Assay (ELISA), Radio Immuno Assay (RIA). Measuring and optical instruments. Research methodologies; Formation of research design on a specific problem. Central tendency and Dispersion. Test of significance. Analysis of variance, Correlation and Regression.

Module 3: FORENSIC PHOTOGRAPHY (8 Periods)

Basic principles of Photography, Techniques of black & white and color photography, cameras, lenses, shutters, depth of field, film; exposing, development and printing techniques; Different kinds of developers and fixers; UV, IR, fluorescence illumination guided photography; Modern development in photography- digital photography, working and basic principles of digital photography; Surveillance photography. Videography and Crime Scene & laboratory photography.

Module 4: CRIME SCENE MANAGEMENT (11 Periods)

Crime scene investigations, protecting and isolating the crime scene; Documentation, sketching, field notes and photography. Searching, handling and collection, preservation and transportation of physical evidences, Chain of custody and Reconstruction of scene of crime. Report writing.

Module 5: LAW AND FORENSIC SCIENCE (8 Periods)

Legal aspects of Forensic Science: Forensic Science in the Criminal Justice System, The Criminal Investigation Process, Production of Evidence: The Subpoena, The Rules of Evidence, Authentication of Evidence: The Chain of Custody, The Admissibility of Evidence, Laboratory Reports, Examples of Analysis and Reports, Expert Testimony, Getting into Court, Testifying, Being a Witness and an Expert, Considerations for Testimony.

Total Periods: 45

EXPERIENCIAL LEARNING

1. Study of Computer Forensics and different tools used for forensic investigation
2. **Identify and list the steps for hiding and extract any text file behind an image file/ Audio file using Command Prompt**

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Houck M.M and Siegel J.A, *Fundamentals of Forensic Science*, Elsevier, 2nd edition, 2010.
2. Sharma B.R, *Forensic Science in Criminal Investigation and Trials*, Universal Publishing Co., New Delhi, 2003.

REFERENCE BOOKS:

1. Nanda B.B and Tewari, R.K, *Forensic Science in India- A vision for the Twenty First Century*, Select Publisher, New Delhi, 2001.
2. James, S.H and Nordby, J.J, *Forensic Science- An Introduction to Scientific and Investigative Techniques*, CRC Press, USA, 2003.
3. Saferstein, Criminalistics, *An Introduction of Forensic Science*, Prentice Hall Inc, USA,2007.
4. Barry, A.J. Fisher, *Techniques of Crime Scene Investigation*, CRC Press, NewYork, 7th edition, 2003.

VIDEO LECTURES:

1. <https://nptel.ac.in/courses/106106178>
2. <https://www.youtube.com/watch?v=X5fo1H7bc0g>

WEB RESOURCES:

1. <https://www.nist.gov/forensic-science>
2. <https://www.coursera.org/learn/forensic-science>

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22EC101701	AI IN HEALTHCARE	3	-	-	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Artificial Intelligence (AI) in Healthcare; The Present State and Future of AI in Healthcare Specialties; The Role of Major Corporations in AI in Healthcare; Applications of AI in Healthcare.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Understand the fundamental concepts of AI in Healthcare sector.
- CO2** Analyze the present state and future of AI in Healthcare specialties for different scenarios.
- CO3** Apply design concepts and metrics for AI in Healthcare.
- CO4** Demonstrate basic concepts and terminologies of future applications of Healthcare in AI.
- CO5** Develop AI applications through AI techniques for healthcare

CO-PO Mapping Table

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	-	-	-	-	-	-	-	-
CO2	2	3	-	2	-	2	2	-	-	-	-	-
CO3	2	-	2	2	-	-	-	-	-	-	-	-
CO4	2	-	-	-	2	2	-	-	-	-	-	-
CO5			3									
Course Correlation Mapping	2	-	3	2	2	2	2	-	-	-	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN HEALTHCARE (08 Periods)

Introduction to AI in Healthcare, Benefits & Risks, AI in the health sector, AI versus human intelligence, The future of AI in health sector, AI & Neural networks.

Module 2: THE PRESENT STATE & FUTURE OF AI IN HEALTHCARE SPECIALTIES (10 Periods)

Artificial Intelligence in: preventive healthcare, Radiology, Pathology, Surgery, Anesthesiology, Psychiatry, Cardiology, Pharmacy, Dermatology, Dentistry, Orthopedics, Ophthalmology.

Module 3: THE ROLE OF MAJOR CORPORATIONS IN AI IN HEALTHCARE (08 Periods)

IBM Watson, The role of Google & Deep mind in AI in Healthcare, Baidu, Facebook & AI in Healthcare, Microsoft & AI in Healthcare.

Module 4: FUTURE OF HEALTHCARE IN AI (10 Periods)

Evidence-based medicine, personalized medicine, Connected medicine, Virtual Assistants, Remote Monitoring, Medication Adherence, Accessible Diagnostic Tests, Smart Implantables, Digital Health and Therapeutics, Incentivized Wellness, Block chain, Robots, Robot-Assisted Surgery, Exoskeletons, Inpatient Care, Companions, Drones, Smart Places, Smart Homes, Smart Hospitals.

Module 5: APPLICATIONS OF AI IN HEALTHCARE (09 Periods)

Case Study 1: AI for Imaging of Diabetic Foot Concerns and Prioritization of Referral for Improvements in Morbidity and Mortality.

Case Study 2: Outcomes of a Digitally Delivered, Low-Carbohydrate, Type 2 Diabetes Self-Management.

Case Study 3: Delivering A Scalable and Engaging Digital Therapy.

Case Study 4: Improving Learning Outcomes for Junior Doctors through the Novel Use of Augmented and Virtual Reality for Epilepsy.

Case Study 5: Big Data, Big Impact, Big Ethics: Diagnosing Disease Risk from Patient Data.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Analyze how the artificial intelligence is used to predict the disease result and Prognosis Assessment of a patient.
2. How does drug discovery happen and how does AI is helping in drug discovery and Labs.
3. Justify that artificial intelligence provide engineering solutions for early detection and Diagnosis of diseases.
4. Demonstrate the prediction of bladder volume of a patient.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. Dr. Parag Mahajan, *Artificial Intelligence in Healthcare*, MedManthra Publications, First Edition 2019.
2. Arjun Panesar, *Machine Learning and AI for Healthcare Big Data for Improved Health*, Apress Publications, 2019.

REFERENCE BOOKS:

1. Michael Matheny, Sonoo Thadaney Israni, Mahnoor Ahmed, and Danielle Whicher, *Artificial Intelligence in Health Care: The Hope, the Hype, the Promise, the Peril*, National Academy of Medicine Publication, First Edition 2019.

VIDEO LECTURES:

1. <https://www.youtube.com/watch?v=-aHBwTQQyNU>
2. <https://intellipaat.com/blog/artificial-intelligence-in-healthcare/>

Web Resources:

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616181/>
2. <https://www.ibm.com/topics/artificial-intelligence-healthcare>
3. <https://builtin.com/artificial-intelligence/artificial-intelligence-healthcare>

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS201702	PEDAGOGY STUDIES	3	-	-	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course deals with understanding pedagogical practices that are being used by teachers in formal and informal classrooms, the effectiveness of pedagogical practices, teacher education (curriculum and practicum), and the school curriculum and guidance materials that can best support effective pedagogy.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1** Demonstrate knowledge of pedagogical methodology
- CO2** Analyze the functional knowledge in Pedagogical practices, Curriculum, and Teacher Education
- CO3** Learn effective pedagogical practices and apply strategies.
- CO4** Function effectively as an individual and as a member of the Professional development.
- CO5** Understand research Gaps and provide future Directions.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	-	-	-	-	-	3	-	-
CO2	2	3	-	-	3	-	-	-	-	3	-	-
CO3	2	2	-	-	3	-	-	-	-	3	-	-
CO4	1	1	-	-	-	-	-	-	3	3	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-
Course Correlation Mapping	2	2	-	-	3	-	-	-	3	3	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION AND METHODOLOGY (09 Periods)

Aims and rationale, Policy background, Conceptual framework and terminology Theories of learning, Curriculum, Teacher education. Conceptual framework, Research questions. Overview of Methodology and Searching- Case studies

Module 2: THEMATIC OVERVIEW (09 Periods)

Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries. Curriculum, Teacher Education- Case studies

Module 3 EFFECTIVENESS OF PEDAGOGICAL PRACTICES (09 Periods)

Evidence on the effectiveness of pedagogical practices, Methodology for the in-depth stage: quality assessment of included studies, teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy, Theory of change, Strength and nature of the body of evidence for effective pedagogical practices. Pedagogic theory and pedagogical approaches. Teachers' Attitudes and beliefs and Pedagogic strategies- Case studies

Module 4 PROFESSIONAL DEVELOPMENT (09 Periods)

alignment with classroom practices and follow-up support, Peer support, and Support from the head teacher and the community. Curriculum and assessment, Barriers to learning: limited resources and large class sizes- Case studies

Module 5 RESEARCH GAPS AND FUTURE DIRECTIONS (09 Periods)

Research design, Contexts, Pedagogy, Teacher Education, Curriculum and Assessment, Dissemination and research impact- Case studies

Total Periods: 45

EXPERIENTIAL LEARNING

1. List out the self-improvement in you after going through pedagogical methodologies.
2. Discuss different practices that you would like to adopt in the curriculum.
3. Describe in your own words how can you bring effectiveness to the curriculum.
4. Imagine you are a head teacher and illustrate different barriers to learning.
5. Assume you are a teacher and Interpret different directions that you would bring for the assessment of the students.

(It's an indicative one. The Course Instructor may change the activities and the same shall be reflected in the Course Handout)

RESOURCES

TEXTBOOK:

Master of Physiotherapy- Cardiovascular and Pulmonary

1. Ackers J, Hardman F (2001) Classroom interaction in Kenyan primary schools, *Compare*, 31 (2): 245-261.
2. Alexander RJ (2001) Culture and pedagogy: International comparisons in primary education.

REFERENCES:

1. Akyeampong K (2003) Teacher training in Ghana - does it count? Multi-site teacher
2. Agrawal M (2004) Curricular reform in schools: The importance of evaluation, *Journal of*
3. Akyeampong K, Lussier K, Pryor J, Westbrook J (2013) Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count? *International*
4. Chavan M (2003) Read India: A mass scale, rapid, 'learning to read' campaign.

VIDEO LECTURES:

1. <https://www.youtube.com/watch?v=WL40UeySag4>
2. <https://www.youtube.com/watch?v=MMXaXDIHFJ8>
3. <https://www.youtube.com/watch?v=7uJL1R6M4Iw>

WEB RESOURCES:

1. <https://acrl.ala.org/IS/instruction-tools-resources-2/pedagogy/a-selected-list-of-journals-on-teaching-learning/>
2. <https://guides.douglascollege.ca/TLonline/resourcesforonlinepedagogy>
3. https://www.refseek.com/directory/teacher_resources.html

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22LG201701	PERSONALITY DEVELOPMENT	3	-	-	-	3
Pre-Requisite	-					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course gives awareness to students about the various dynamics of personality development.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

- CO1.** Demonstrate knowledge in Self-Management and Planning Career
- CO2.** Analyze the functional knowledge in attitudes and thinking strategies
- CO3.** Learn and apply soft skills for professional success.
- CO4.** Function effectively as an individual and as a member in diverse teams
- CO5.** Communicate effectively in public speaking in formal and informal situations.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	2	1	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-
CO3	2	2	-	-	3	-	-	-	-
CO4	1	1	-	-	-	-	-	-	3
CO5	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	2	2	3	-	3	-	-	-	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: SELF-ESTEEM & SELF-IMPROVEMENT (09 Periods)

Know Yourself – Accept Yourself; Self-Improvement: Plan to Improve - Actively Working to Improve Yourself- Exercises- case studies

Module 2: DEVELOPING POSITIVE ATTITUDES (09 Periods)

How Attitudes Develop – Attitudes are Catching – Improve Your Attitudes – Exercises-
case studies

Module 3 SELF-MOTIVATION & SELF-MANAGEMENT (09 Periods)

Show Initiative – Be Responsible Self-Management; Efficient Work Habits – Stress Management – Employers Want People Who can Think – Thinking Strategies- Exercises-
case studies

Module 4 GETTING ALONG WITH THE SUPERVISOR (09 Periods)

Know your Supervisor – Communicating with your Supervisor – Special Communication with your Supervisor – What Should you Expect of Your Supervisor? – What your Supervisor expects

of you - Moving Ahead Getting Along with your Supervisor- Exercises- case studies

Module 5 WORKPLACE SUCCESS (09 Periods)

First Day on the Job – Keeping Your Job – Planning Your Career – Moving Ahead- Exercises-
case studies

Total Periods: 45

EXPERIENTIAL LEARNING

1. List out the self-improvements in you on the charts and explain in detail.
2. Discuss different famous personalities and their attitudes.
3. Describe different personalities with respect to self-motivation and self-management.
4. Imagine you are a supervisor and illustrate different special communications.
5. Assume and Interpret different experiences on the first day of your job.

RESOURCES

TEXTBOOK:

- 1 Harold R. Wallace and L. Ann Masters, *Personal Development for Life and Work*, Cengage Learning, Delhi, 10th edition Indian Reprint, 2011. (6th Indian Reprint 2015)
- 2 Barun K. Mitra, *Personality Development and Soft Skills*, Oxford University Press, 2011.

REFERENCE BOOKS:

- 1 K. Alex, *Soft Skills*, S. Chand & Company Ltd, New Delhi, 2nd Revised Edition,
- 2 Stephen P. Robbins and Timothy A. Judge, *Organizational Behaviour*, Prentice Hall, Delhi, 16th edition, 2014

VIDEO LECTURES:

1. <https://www.youtube.com/watch?v=6Y5VWBLi1es>
2. <https://www.youtube.com/watch?v=H9qA3inVMrA>

Web Resources:

1. <https://www.universalclass.com/.../the-process-of-perso...>
2. <https://www.ncbi.nlm.nih.gov/pubmed/25545842>
3. <https://www.youtube.com/watch?v=Tuw8hxrFBH8>