MANIPAL
ACADEMY of HIGHER EDUCATION
(Deemed to be University under Section 3 of the UGC Act, 1956)

Manipal College of Health Professions

(Mangaluru Campus)

Manipal Academy of Higher Education, Manipal

Outcome-Based Education (OBE) Framework

Two Years Full Time

Postgraduate Program

(Choice - Based Credit System)

Master of Physiotherapy (Cardiopulmonary Sciences)

MPT (Cardiopulmonary Sciences)

With effect from July 2021

C O N T E N T P A G E

Head of the Department **Dean**

Deputy Registrar - Academics **Registrar**

1. NATURE AND EXTENT OF THE PROGRAM

Background and need of the program:

Physiotherapy in India has a history of over 70 years. It is a changing and evolving profession which encompasses the concepts of public health and primary/secondary prevention, rehabilitation and fitness for work, self-management of long term conditions and the provision of palliative care for all ages. The physiotherapist works in a complex environment and with multidisciplinary teams in primary healthcare industry, schools, hospitals and private practices. This work takes place in diverse communities and cultures. In a climate of changing health needs and healthcare provision, the physiotherapist requires skills in leadership and decision making. Lifestyle changes over the years resulted in an increase in the problems of neurological, musculoskeletal and cardiopulmonary systems. This means that the services of physiotherapists are in greater demand. Here at MAHE, we constantly upgrade our education and clinical skills to keep up with the current needs. The infrastructure at Kasturba Hospital Udupi, Manipal, and Mangalore and Manipal Hospital Bangalore provide an almost unending canvas to work on.

Duration of the Program: Two years

- Four Semesters (Two years) of academic program

Aim of the Program:

i. To provide an opportunity for qualified physiotherapists with an undergraduate degree to practice as Cardiopulmonary Physiotherapists.

ii. To educate and empower the students to be independent practitioners using an advanced body of knowledge in a competent manner towards those who need such services, using evidence based practice with autonomy in quality assurance while maintaining the humanitarian approach of service.

iii. To acquire skills required to be an effective theoretical & clinical teacher in physiotherapy, be proficient in research methods and apply these in the pursuance of research in physiotherapy.

iv. To learn elements of administration in order to be an effective physiotherapy manager.

v. To practice life-long learning, professional development, for the benefit of students, the profession and to increase the effectiveness of health and social care delivery.

Entry level Qualification:

i. The candidate must have passed Bachelor of Physiotherapy from any recognized University in India or abroad.

ii. The candidate should have obtained an aggregate of 50% in all subjects of Bachelor of Physiotherapy

Scope of the Program:

On completion of the M.P.T. program, the graduates will be a competent physiotherapy specialist having heightened ethical and moral responsibilities as a health professional, demonstrating strong clinical reasoning skills with evidence-based approach in assessment, clinical diagnosis and intervention of a wide range of diseases and dysfunctions in nervous system. Postgraduates will have job opportunities in various acute hospitals, rehabilitation centers, multispecialty hospitals, special schools, geriatric centers, private organizations, non-government organizations and government institutions.

- Postgraduates can also pursue doctoral studies in clinical areas of their interest and become teaching faculty in the academic institutions.
- Postgraduates may also undertake research in Physiotherapy.

2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The overall objective of the learning outcome-based curriculum framework (LOCF) for MPT (Cardiopulmonary Sciences) are as follows:

PEO No.	Education Objective
PEO 1	Students will be able to apply advanced body of knowledge and clinical competency with evidence based practice in Physiotherapy to achieve professional excellence.
PEO 2	Students will execute high order skills in analysis, critical evaluation and/or professional application of clinical and practical skills in Physiotherapy
PEO 3	Students will practice the profession by ethical norms and communicate effectively with the multi-disciplinary team.
PEO 4	Students will acquire creative proficiency in interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution.
PEO 5	Students will synthesize research ideas, develop innovations, incubate new concepts and encourage entrepreneurship.
PEO 6	Students will display lifelong learning process for a highly productive career and will be able to relate the concepts of Physiotherapy towards serving the cause of the society.

3. GRADUATE ATTRIBUTES

S No.	Attribute	Description
1.	**Professional Knowledge**	Critically appraise scientific knowledge and integrate evidence based practice as a health care professional
2.	**Clinical / practical skills**	Apply clinical / practical skills to prevent, assess and manage quality health care services
3.	**Communication**	Displays empathetic and professional communication skills to patients/clients, care-givers, other health professionals and other members of the community
4.	**Cooperation/Team work**	Ability to practice collaboratively and responsibly with multidisciplinary team members to deliver high quality health care
5.	**Professional ethics**	Ability to resolve ethical issues and practice the ethical values in the professional life
6.	**Research / Innovation-related Skills**	Ability to generate and investigate research questions and translate the evidence into clinical practice.
7.	**Critical thinking and problem solving**	Ability to reason and judge critically and provide solutions for real life situations
8	**Reflective thinking**	Employ reflective thinking along with sense of awareness of one self and society
9	**Information/digital literacy**	Excel in use information communication and technology in ongoing learning situations
11.	**Multi-cultural competence**	Ability to effectively lead and respond in a multicultural society
12.	**Lifelong Learning**	Demonstrate the ability to acquire knowledge and skills that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to demands of work place through knowledge/skill development/reskilling.

4. QUALIFICATION DESCRIPTORS:

a. Apply (i) Advanced and up-to-date knowledge and excel in the academic field of study as a whole and its applications, and links to related disciplinary areas/subjects of study; including a critical understanding of the established theories, principles and concepts, and of a number of advanced and emerging issues in the field of Physiotherapy (ii) Procedural knowledge that creates different types of professionals related to the Physiotherapy, including research and development, teaching and in government and public service; (iii) Professional and communication skills in the domain of Physiotherapy, including a critical understanding of the latest developments, and an ability to use established techniques in the domain of Physiotherapy.

b. Possess comprehensive knowledge about Physiotherapy, including current research, scholarly, and/or professional literature, relating to essential and advanced learning areas pertaining to the field of study, and techniques and skills required for identifying problems and issues.

c. Proficient skills in i) identifying the issues in health care needs; ii) collection of quantitative and/or qualitative data relevant to client's needs and professional practice; iii) analysis and interpretation of data using methodologies as appropriate for formulating evidence based hypotheses and solutions.

d. Apply knowledge, understanding and skills for critical assessment of a wide range of ideas and complex problems and issues relating to Physiotherapy in various specialties.

e. Communicate efficiently with all stakeholders, and provide relevant information to the members of the healthcare team.

f. Optimize one's own learning needs relating to current and emerging areas of study, making use of research, development and professional materials based on new frontiers of knowledge.

g. Execute one's disciplinary knowledge and transferable skills to new/unfamiliar contexts and to identify and analyse problems and issues and seek solutions to real-life problems.

5. PROGRAM OUTCOMES (POs):

After successful completion of Master of Physiotherapy (Cardiopulmonary Sciences) program, students will be able to:

PO No.	Attribute	Competency
PO 1	**Professional knowledge**	Apply current evidence and **scientific knowledge** to work as an expert member of health care system
PO 2	**Clinical/ Technical skills**	Employ **clinical skills** to provide quality health care services
PO 3	**Team work**	Empower the **team** with shared goals with the interdisciplinary health care team to improve societal health
PO 4	**Ethical value & professionalism**	Impart **ethical values and professionalism** within the legal framework of the society
PO 5	**Communication**	**Communicate** professionally with the multidisciplinary health care team and the society
PO 6	**Evidence based practice**	Appraise and adopt high quality **evidence based practice** that leads to excellence in professional practice
PO 7	**Life-long learning**	Advance knowledge and skills with the use of recent technology for the **continual improvement** of professional practice
PO 8	**Entrepreneurship, leadership and mentorship**	Build **entrepreneurship, leadership and mentorship** skills to practice independently as well as in collaboration with the multidisciplinary health care team

6. COURSE STRUCTURE, COURSE WISE LEARNING OBJECTIVE, AND COURSE OUTCOMES (COs)

SEMESTER - I

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
ABS6101	Advanced Biostatistics & Research Methodology	3	1	-	-	4	30	70	100
PTH6001	Principles of Physiotherapy Practice	1	2	-	-	3	100	-	100
PTH6003	Clinical Practice in Physiotherapy	-	-	-	36	12	100	-	100
PTH6170	Research Proposal in Cardiopulmonary Sciences	-	-	4	-	2	100	-	100
	Total	**4**	**3**	**4**	**36**	**21**	**330**	**70**	**400**

Note:
ABS6101 will be conducted for 50 marks and normalized to 70 marks

SEMESTER - II

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
EPG6201	Ethics and Pedagogy	1	1	-	-	2	100	-	100
PTH6102	Foundations of Physiotherapy in Cardiopulmonary Sciences	1	2		-	3	50	50	100
PTH6104	Physiotherapy Clinical Practice in Cardiopulmonary Sciences - I	-	-	-	36	12	100	-	100
PTH6180	Research Progress in Cardiopulmonary Sciences – I	-	-	4	-	2	100	-	100
	Total	**2**	**3**	**4**	**36**	**19**	**350**	**50**	**400**

Note:
PTH6102 will be conducted for 100 marks and normalized to 50 marks

SEMESTER - III

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7101	Physiotherapy in General Cardiopulmonary Sciences	1	2	-	-	3	50	50	100
PTH7103	Physiotherapy Clinical Practice in Cardiopulmonary Sciences - II	-	-	-	36	12	50	50	100
PTH7105	Evidence Based Physiotherapy Practice in Cardiopulmonary Sciences	1	1	-	-	2	100	-	100
PTH7170	Research Progress in Cardiopulmonary Sciences -II	-	-	6	-	3	100	-	100
	Total	**2**	**3**	**6**	**36**	**20**	**300**	**100**	**400**
Note: PTH7101 will be conducted for 100 marks and normalized to 50 marks PTH7103 will be conducted for 100 marks and normalized to 50 marks									

SEMESTER – IV

Program Elective

The student may choose from anyone options from the list of Program Elective combinations provided in the table below.

Option-1: Elective in Critical care Physiotherapy

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7112	Physiotherapy in Critical care Physiotherapy	1	2	-	-	3	50	50	100
PTH7114	Clinical practice in Critical care Physiotherapy	-	-	-	36	12	50	50	100
PTH7180	Research Project in Cardiopulmonary Sciences	-	-	10	-	5	50	50	100
	Total	**1**	**2**	**10**	**36**	**20**	**150**	**150**	**300**
Note: PTH7112 will be conducted for 50 marks PTH7114 will be conducted for 100 marks and normalized to 50 marks									

Option-2: Elective in Cardiopulmonary rehabilitation

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7122	Physiotherapy in Cardiopulmonary Rehabilitation	1	2	-	-	3	50	50	100
PTH7124	Clinical Practice of Physiotherapy in Cardiopulmonary Rehabilitation	-	-	-	36	12	50	50	100
PTH7180	Research Project in Cardiopulmonary Sciences	-	-	10	-	5	50	50	100
	Total	**1**	**2**	**10**	**36**	**20**	**150**	**150**	**300**
Note: PTH7122 will be conducted for 50 marks PTH7124 will be conducted for 100 marks and normalized to 50 marks									

SEMESTER – IV-Elective in Health Promotion and Fitness

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7132	Physiotherapy in Health Promotion and Fitness	1	2	-	-	3	50	100	150
PTH7134	Clinical Practice of Physiotherapy in Health Promotion and Fitness	-	-	-	36	12	50	100	150
PTH7180	Research Project in Cardiopulmonary Sciences	-	-	10	-	5	50	50	100
	Total	**1**	**2**	**10**	**36**	**20**	**150**	**250**	**400**
Note: PTH7132 will be conducted for 50 marks PTH7134 will be conducted for 100 marks and normalized to 50 marks									

OVERALL CREDIT DISTRIBUTION

Semester	Credit distribution					Marks Distribution		
	L	T	P	CL	CR	IAC	ESE	Total
I - SEMESTER	4	3	4	36	21	330	70	**400**
II - SEMESTER	2	3	4	36	19	350	50	**400**
III - SEMESTER	2	3	6	36	20	300	100	**400**
IV - SEMESTER	1	2	10	36	20	150	150	**300**
Grand Total	**9**	**11**	**24**	**144**	**80**	**1130**	**370**	**1500**

INTERNAL ASSESSMENT COMPONENT (IAC) WEIGHTAGE DISTRIBUTION

Theory		Practical		Research	
Components	**%**	**Components**	%	**Components**	**%**
Mid semester exam	50	Case presentation	50	Performance evaluation	50
Class seminar	30	Clinical performance	50	Presentation/ Report submission	50
Assignments	20				

SEMESTER - I

COURSE CODE	:	COURSE TITLE
ABS6101	:	Advanced Biostatistics & Research Methodology
PTH6001	:	Principles of Physiotherapy Practice
PTH6003	:	Clinical Practice in Physiotherapy
PTH6170	:	Research Proposal in Cardiopulmonary Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary sciences)
Course Title	**Advanced Biostatistics & Research Methodology**
Course Code	**ABS6101**
Academic Year	First
Semester	I
Number of Credits	04
Course Prerequisite	Students should have basic knowledge of research and statistical tools
Course Synopsis	This course enables the student to understand the basics of research methods and design a research protocol for their research question. Additionally the course also enables the student to estimate sample size for their study, use statistical tests to analyse the results of the study and make meaningful interpretations.

Course Outcomes (COs): At the end of the course student shall be able to:	
CO1	Define the terms related to statistics and research methods (C1)
CO2	List and explain the research designs and sampling techniques (C2)
CO3	Explain, calculate and interpret the measures of central tendency (C4)
CO4	Determine sample size for the studies using means and proportions formula (C5)
CO5	Analyse and interpret the outputs of parametric and non-parametric tests (C4)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x					x		
CO3	x							
CO4	x						x	
CO5	x							

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1	1. Define statistics (C1) 2. List the uses of statistics in health science research. (C1) 3. Explain the role of Statistics in clinical and	**4**

Content	Competencies	Number of Hours
	preventive Medicine. (C2) 4. Differentiate qualitative and quantitative variables with examples. (C3) 5. Differentiate discrete and continuous variables with examples. (C4) 6. List the properties of various scales of measurement with example. (C1) 7. Define central tendency, measure of central tendency. (C1) 8. Define arithmetic mean, median and mode. List the properties, situation for use, and examples. (C1) 9. Determine the three measures from raw data. (C5)	
Unit 2:		
	1. Define and calculate quartiles and percentiles. (C4) 2. Define measures of dispersion (C1) 3. Define, calculate and interpret range, quartile deviation, interquartile range, standard deviation, variance and coefficient of variation.(C4) 4. Give the situation for the use of these measures (C2).	**4**
	1. Describe the properties of Normal and Standard Normal Distribution with sketch (C2) 2. List the applications.(C1) 3. Calculate probabilities recollecting the coverage of the intervals mean±SD, , mean±2SD, mean±3SD (C4) 4. Define skewness and list the characteristics with sketch.(C1) 5. Define kurtosis and list the characteristics with sketch.(C1) 6. Define and differentiate parameter and statistic with examples (C4). 7. Define the basic terms-population, sample, sampling, parameter, statistic, estimate and estimator. (C1) 8. Define Point estimate (C1) 9. Define and Differentiate standard deviation and standard error (C4) 10. Define sampling distribution (C1) 11. Describe the importance of sampling distributions of different statistics.(C2) 12. Determine the sampling distribution of sample mean, sample proportion, difference between two means, difference between two proportions	**5**

Content	Competencies	Number of Hours
	(Large sample approximation (CLT).(C5) 13. Calculate the standard error of mean, proportion, difference between two means, and difference between two proportions. (Large sample approximation (CLT). (C4)	
	1. Construct and interpret confidence interval for mean, difference between two means, proportion, difference between two proportions (large sample approximation) (C5)	**3**
Unit 3:		
	1. Define /explain with example the concept of null hypothesis, alternative hypothesis, type I and type II errors. (C2) 2. Define level of significance, power of the test and p-value (C1) 3. Explain the difference between one sided and two-sided test (C2) 4. Give the situation for non-parametric tests. (C2) 5. List the differences, merits and demerits of non-parametric over parametric tests. (C1)	**4**
	1. Explain the situation, hypothesis tested, assumptions and example for paired and unpaired t-test. (C2) 2. Interpret the output of paired and unpaired t-test (C4) 3. Explain the situation, hypothesis tested, assumptions and example for one-way and repeated measures ANOVA (C2)	**3**
	1. Explain the situation, hypothesis tested, assumptions and example for : Mann-Whitney U-test, Wilcoxon signed rank test, Kruskal-Wallis ANOVA and Friedman's ANOVA (C2) 2. Explain the situation, hypothesis tested, assumptions and example for Chi square test association/independence and McNemar's test for association (C2) 3. Computation and interpretation of chi-square test (2 x2 table) and McNemar's test result (C2)	**4**
	1. Give example for positive and negative correlations. (C2) 2. Explain different types of correlation with the help of scatter diagrams. (C2) 3. Give the assumptions, properties, and interpretation of correlation coefficient.(C4) 4. Explain the situation for the computation of Pearson's and Spearman's correlation	**4**

Content	Competencies	Number of Hours
	coefficient. (C2) 5. Interpret coefficient of determination.(C4) 6. Explain the situation, example, application and assumptions for linear and multiple regression.(C2) 7. Interpret regression coefficients in simple and multiple regression.(C4) 8. Explain the need for sample size computation.(C2) 9. Given the situation/ingredients, should be able to determine sample size for estimating mean and proportion, testing of difference in means and proportions of two groups.(C5)	
	1. Explain the difference between rate, ratio, and proportion with example. (C2) 2. Calculate rate, ratio, and proportion (C4) 3. Define and calculate Incidence and prevalence rates.(C4) 4. Explain the design, merits and demerits of Case report, case series analysis, prevalence studies and ecological studies with example (C2)	**3**
	1. Explain the design, analysis (2x2 table and odds ratio), merits and demerits ((unmatched and 1:1 matched design) of case control study with example.(C2) 2. Explain the design, analysis (2x2 table and relative risk), merits and demerits of cohort study with example.(C2)	**3**
	1. Explain confounding with example. (C2) 2. List the methods to deal with confounding at design and analysis stage.(C1) 3. Explain the design, analysis, merits and demerits of RCT with example. (C2) 4. Explain the need of simple, block and stratified randomization with example.(C2) 5. Explain the need and type of blinding with example (C2)	**4**
	1. Explain the situation for the use of logistic regression and survival analysis with example.(C2)	**3**
	1. Define Population, sample, sampling, and sampling frame. Give one example each.(C1) 2. List the characteristics of a good sample.(C1) 3. Differentiate and list the advantages and disadvantages of random and non- random sampling techniques.(C4)	**4**

Content	Competencies	Number of Hours
	4. Explain simple, stratified, systematic, cluster and multistage random sampling techniques with examples. List the merits and demerits of each of them.(C2) 5. Explain Convenience, quota, judgment and snowball sampling with examples. List the merits and demerits of each of them.(C2) 6. Explain the difference between sampling and non-sampling errors. Give example for sampling and non-sampling errors. List the methods to minimize these errors.(C2)	
	1. Define Sensitivity, specificity, PPV and NPV. (C1) 2. Explain with example method of computation and interpretation. (C4) 3. Explain with example, the situation for the application of Bland Altman plot, Kappa statistic. (C2) 4. Explain the interpretation of Kappa Statistics.(C2) 5. Explain the format of various research documents. (C2)	**4**
	Total	**52**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	42	84
Tutorial	4	8
Self-directed learning (SDL)	6	12
Total	**52**	**104**

Assessment Methods	
Formative	**Summative**
Assignments/Presentations/Quiz	Mid Semester Exam
	End Semester Exam

Mapping of Assessment with COs					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester Examination	x	x	x		
Quiz / Assignment				x	x
End Semester Exam	x	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback

Main Reference:	1. Research for Physiotherapists: Project Design and Analysis - Caroline Hicks. (1995) 2. Tests, Measurements and Research in Behavioural Sciences by A K Singh (1986) 3. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. (2015) 4. Foundations of Clinical Research by Leslie Gross Portney (2020) 5. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A (2018)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Principles of Physiotherapy Practice**
Course Code	**PTH6001**
Academic Year	First
Semester	I
Number of Credits	03
Course Prerequisite	Students should have basic knowledge and skills in physiotherapy practice
Course Synopsis	The course will provide information about principles of evaluation and management of people with musculoskeletal, neurological, cardiorespiratory, paediatric, women health and geriatric disorders to apply basic and applied sciences in the evaluation and management. This course will also help the students to gain insights regarding standards of physiotherapy practice in the institution and community healthcare settings. This course will be delivered in the form of lectures, tutorials, and self-directed learning. Theory examination will be used to assess the students' transferable skills and the learning outcomes.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Outline the guidelines for standards of physiotherapy practice (C4)
CO2	Explain disability, models of disability and disability evaluation (C4)
CO3	Explain the biomechanics, physiology and control of human movement (C4)
CO4	Outline the principles of physiotherapy evaluation and treatment in various diseases and disorders relevant to physiotherapy practice (C4)
CO5	Explain the process of clinical reasoning and decision making in physiotherapy practice (C4)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							x
CO2	x							
CO3	x							
CO4	x					x		
CO5	x					x		

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Standards of physiotherapy practice	1. Outline the national and international guidelines for standards of physiotherapy practice (C4)	01
Unit 2		
Disability and evaluation	1. Explain disability (C4) 2. Distinguish between different models of disability (C4) 3. Explain disability evaluation (C4)	02
Unit 3		
Development of Posture and Movement across life span	1. Explain the development of postural control across life span (C4) 2. Explain the development of movement across life span (C4) 3. Explain the development and maturation of reflexes (C4)	02
Unit 4		
Biomechanics	1. Outline the biomechanics of TMJ, Joints of Thorax, Spine and Pelvis, Joints of Upper and Lower Extremity (C4)	01
Unit 5		
Exercise Physiology	1. Explain the acute responses and chronic adaptations to exercise (C4) 2. Explain the principles of exercise testing and prescription (C2)	03
Unit 6		
Pain	1. Explain the physiology of pain (C4) 2. Distinguish between different mechanisms of pain control (C4) 3. Categorize the strategies of pain management (C4)	01
Unit 7		
Neurophysiology of balance, coordination and locomotion	1. Explain the neurophysiology of balance and coordination (C4) 2. Explain the neurophysiology of locomotion (C4)	02
Unit 8		
Theories of Motor control and Motor Learning	1. Explain motor control (C4) 2. Compare and contrast between different theories of Motor control (C4)	02

Content	Competencies	Number of Hours
	3. Explain motor learning and theories of Motor Learning (C4)	
Unit 9		
Principles of physiotherapy evaluation	1. Outline the principles of musculoskeletal, neurological, and cardiopulmonary evaluation (C4) 2. Outline the special considerations for physiotherapy evaluation in children, women and older adults (C4) 3. Outline the evaluation protocols for physical fitness (C4) 4. Explain the principles of diabetic foot examination (C4)	08
Unit 10		
Gait	1. Distinguish between normal and pathological gait (C4) 2. Explain the methods of gait analysis (C4)	01
Unit 11		
Principles and applications of Electrodiagnosis	1. List the electrodiagnostic methods (C4) 2. Explain the principles of electrodiagnostic testing methods (C4) 3. Outline the clinical applications of electrodiagnostic methods (C4)	01
Unit 12		
Outcome Measures in Physiotherapy	1. Categorize the outcome measures based on body structure and function, activity and participation domains of ICF (C4) 2. Explain the psychometric properties of commonly used outcome measures (C4) 3. Explain the method of administration and interpretation of commonly used outcome measures (C4)	03
Unit 13		
Clinical investigations relevant to Physiotherapy practice	1. Choose the clinical investigations relevant to Physiotherapy practice (C3): Imaging; Biochemical; Electrophysiological; and systemic functional tests 2. Interpret the findings in clinical investigations relevant to Physiotherapy practice (C2)	02
Unit 14		
Physiotherapy treatment approaches	1. Outline the principles of physiotherapy treatment approaches including manual therapy, neurological, paediatric and	02

Content	Competencies	Number of Hours
	cardiopulmonary rehabilitation (C4)	
Unit 15		
Therapeutic electrophysical agents	1. Categorize therapeutic electrophysical agents (C4) 2. Explain the physiological and therapeutic uses, applications and rationale of electrophysical agents (C4)	01
Unit 16		
Community Based Rehabilitation	1. Explain the principles of Community Based Rehabilitation (C4)	01
Unit 17		
Clinical Reasoning / clinical decision making in physiotherapy practice	1. Outline the models of clinical reasoning (C2) 2. Explain the processes involved in clinical decision making (C2) 3. Explain the principles of evidence based practice in physiotherapy (C2)	02
Unit 18		
Universal Precautions	1. Apply the universal precautions for infection control in physiotherapy practice (C3)	01
Unit 19		
Wound care	1. Explain the principles of tissue healing & physiotherapy assessment and management for wound care (C4)	01
Unit 20		
Prosthetics and Orthotics	1. Explain the principles of prosthetic and orthotic prescription (C4) 2. List the types, uses, advantages and disadvantages of upper limb, lower limb and spinal orthosis and prosthesis (C4)	02
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	26	52
Total	**39**	**78**
Assessment Methods		
Formative	**Summative**	
Presentations	Sessional Exam (theory)	

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Sessional Examination	x	x	x	x	x
Assignments/Presentations	x	x	x	x	x

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Albrecht GL, Seelman KD, Bury M, editors. Handbook of disability studies. Sage Publications; 2001 May 24. 2. Bélanger AY. Therapeutic electrophysical agents: evidence behind practice. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2010. 3. Boissonnault WG, editor. Examination in physical therapy practice: screening for medical disease. New York, NY: Churchill Livingstone; 1995 Jun. 4. Braddom's Physical Medicine and Rehabilitation by Cifu David X et al; 5th Ed, Elsevier (2016) 5. Brandt Jr EN, Pope AM. Models of disability and rehabilitation. 6. Cech DJ, Martin ST. Functional movement development across the life span. Elsevier Health Sciences; 2002 Mar 29. 7. Dittmar SS, Gresham GE, editors. Functional assessment and outcome measures for the rehabilitation health professional. Aspen Pub; 1997. 8. Enderby P, John A, Petheram B. Therapy outcome measures for rehabilitation professionals: speech and language therapy, physiotherapy, occupational therapy. John Wiley & Sons; 2013 May 31. 9. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016) 10. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch, Victor K. Katch; 7th edition (2010) 11. Hausdorff JM, Alexander NB, editors. Gait disorders: evaluation and management. Taylor & Francis US; 2005 Jul 15. 12. Haywood K, Getchell N. Life Span Motor Development 6th Edition. Human Kinetics; 2014 Jul 21. 13. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011. 14. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences; 2014. 15. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E-Book. Elsevier Health Sciences; 2013. 16. MCSP PM. Standards of Physiotherapy Practice. 17. Misra UK; et al. Principles of Neurophysiology. Elsevier Health Sciences; 2010

	18. Neumann DA. Kinesiology of the Musculoskeletal System-E-Book: Foundations for Rehabilitation. Elsevier Health Sciences; 2013. 19. Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams & Wilkins; 2001. 20. O'Sullivan SB, Schmitz TJ, Fulk G. Physical rehabilitation. FA Davis; 2013 Jul 23. 21. Perry J. Gait analysis. Normal and pathological function. 2010:19-47. 22. Shumway-Cook A, Woollacott MH. Motor control: translating research into clinical practice. Lippincott Williams & Wilkins; 2007. 23. Shurr DG, Michael JW, Cook TM. Prosthetics and orthotics. Upper Saddle River: Prentice Hall; 2002. 24. Siegelbaum SA, Hudspeth AJ. Principles of neural science. Kandel ER, Schwartz JH, Jessell TM, editors. New York: McGraw-hill; 2000 Jan. 25. Uustal H. Prosthetics and orthotics. InEssential Physical Medicine and Rehabilitation 2006 (pp. 101-118). Humana Press. 26. Wadsworth H, Chanmugam AP. Electrophysical agents in physiotherapy: therapeutic & diagnostic use. Science Press; 1983. 27. Woollacott MH, Shumway-Cook A. Changes in posture control across the life span—a systems approach. Physical therapy. 1990 Dec 1;70(12):799-807. 28. World Confederation for Physical Therapy. WCPT guideline for standards of physical therapy practice. 29. Related scientific publications NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Clinical Practice in Physiotherapy**
Course Code	**PTH6003**
Academic Year	First
Semester	I
Number of Credits	12
Course Prerequisite	Students should have basic knowledge and skills in physiotherapy practice
Course Synopsis	The course will provide information about principles of evaluation and management of people with musculoskeletal, neurological, cardiorespiratory, paediatric, women health and geriatric disorders to apply basic and applied sciences in the evaluation and management. This course will also help the students to gain insights regarding standards of physiotherapy practice in the institution and community healthcare settings. This course will be delivered in the form of practical demonstrations, tutorials, self-directed learning, problem based learning and case based learning. Practical examination will be used to assess the students' transferable skills and the learning outcomes.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Perform physiotherapy assessment and evaluation in people with diseases and disorders (C4, P4, A2)
CO2	Perform physiotherapy techniques in people with diseases and disorders to improve health and wellbeing (C4, P4, A2)
CO3	Recognize and relate the processes involved in clinical decision making in physiotherapy evaluation and treatment (C4, P1, A1)
CO4	Follow ethical and professional behavior (Autonomy, beneficence, justice) during clinical practice and demonstrates the ability to work as a team (A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1		x		x				
CO2		x		x				
CO3		x				x		
CO4		x		x				

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Physiotherapy evaluation in clinical practice	1. Perform musculoskeletal, neurological, and cardiopulmonary physiotherapy evaluation (C4, P4, A2) 2. Explain the special considerations for physiotherapy evaluation in children, women and older adults and display the assessment techniques (C4, P3, A1) 3. Explain the evaluation protocols for physical fitness and measure physical fitness (C4, P3, A1) 4. Explain and demonstrate the components of diabetic foot examination (C4, P2, A1) 5. Explain the methods of analysis and perform posture, balance and gait evaluation (C4, P4, A1) 6. Examine pain and perform pain assessment (C4, P4, A2) 7. Explain and demonstrate the components of physiotherapy assessment in wound care (C4, P2, A1) 8. Choose the outcome measures based on Impairment, activity and participation domains of ICF in the clinical practice (C4, P1, A1) 9. Discuss and display the method of administration of the commonly used outcome measures and interpret it (C4, P3, A1) 10. Choose the clinical investigations relevant to Physiotherapy practice (C3, P1, A1): Imaging; Biochemical; Electrophysiological; and systemic functional tests 11. Identify and interpret the findings in clinical investigations relevant to Physiotherapy practice (C2, P1, A1) 12. Recognize and relate the processes involved in clinical decision making in physiotherapy evaluation (C4, P1, A1) 13. Explain health related information with clients, caregivers, peers and health care professionals and demonstrates the ability to work as a team during evaluation (C4, P5, A3) 14. Demonstrate ethical and professional behavior (Autonomy, beneficence, justice) during physiotherapy evaluation (A3)	234

Content	Competencies	Number of Hours
Unit 2:		
Physiotherapy management in clinical practice	1. Perform physiotherapy techniques in clinical practice including musculoskeletal, neurological, and cardiopulmonary rehabilitation (C4, P4, A2) 2. Explain the special considerations for physiotherapy management in children, women and older adults and display the treatment techniques (C4, P3, A1) 3. Explain the protocols for maintaining and improving physical fitness (C4, P2, A1) 4. Explain the principles of diabetic foot management (C4, P2, A1) 5. Explain the principles of posture, balance and gait rehabilitation and perform treatment techniques to train posture, balance and gait (C4, P4, A1) 6. Categorize and perform the strategies of pain management (C4, P4, A2) 7. Display the method of application of therapeutic electrophysical agents in the clinical practice (C4, P4, A1) 8. Explain the principles of physiotherapy management in wound care (C4, P2, A1) 9. Follow the universal precautions for infection control in physiotherapy practice (C3, P3, A1) 10. Recognize and relate the processes involved in clinical decision making in physiotherapy management (C4, P1, A1) 11. Explain health related information with clients, caregivers, peers and health care professionals and demonstrates the ability to work as a team during treatment (C4, P5, A3) 12. Demonstrate ethical and professional behavior (Autonomy, beneficence, justice) during treatment (A3)	234
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Self-directed learning (SDL)	36	72
Case Based Learning (CBL)	28	56
Clinic	360	-
Practical	28	56
Assessment	16	32
Total	468	216

Assessment Methods	
Formative	**Summative**
Case Presentations	
Clinical Performance	

Mapping of Assessment with COs				
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**
Presentations	x	x	x	
Clinical competency	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Albrecht GL, Seelman KD, Bury M, editors. Handbook of disability studies. Sage Publications; 2001 May 24. 2. Bélanger AY. Therapeutic electrophysical agents: evidence behind practice. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2010. 3. Boissonnault WG, editor. Examination in physical therapy practice: screening for medical disease. New York, NY: Churchill Livingstone; 1995 Jun. 4. Braddom's Physical Medicine and Rehabilitation by Cifu David X et al; 5th Ed, Elsevier (2016) 5. Brandt Jr EN, Pope AM. Models of disability and rehabilitation. 6. Cech DJ, Martin ST. Functional movement development across the life span. Elsevier Health Sciences; 2002 Mar 29. 7. Dittmar SS, Gresham GE, editors. Functional assessment and outcome measures for the rehabilitation health professional. Aspen Pub; 1997. 8. Enderby P, John A, Petheram B. Therapy outcome measures for rehabilitation professionals: speech and language therapy, physiotherapy, occupational therapy. John Wiley & Sons; 2013 May 31. 9. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016) 10. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch, Victor

K. Katch; 7th edition (2010)
11. Hausdorff JM, Alexander NB, editors. Gait disorders: evaluation and management. Taylor & Francis US; 2005 Jul 15.
12. Haywood K, Getchell N. Life Span Motor Development 6th Edition. Human Kinetics; 2014 Jul 21.
13. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011.
14. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences; 2014.
15. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E-Book. Elsevier Health Sciences; 2013.
16. MCSP PM. Standards of Physiotherapy Practice.
17. Misra UK; et al. Principles of Neurophysiology. Elsevier Health Sciences; 2010
18. Neumann DA. Kinesiology of the Musculoskeletal System-E-Book: Foundations for Rehabilitation. Elsevier Health Sciences; 2013.
19. Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams & Wilkins; 2001.
20. O'Sullivan SB, Schmitz TJ, Fulk G. Physical rehabilitation. FA Davis; 2013 Jul 23.
21. Perry J. Gait analysis. Normal and pathological function. 2010:19-47.
22. Shumway-Cook A, Woollacott MH. Motor control: translating research into clinical practice. Lippincott Williams & Wilkins; 2007.
23. Shurr DG, Michael JW, Cook TM. Prosthetics and orthotics. Upper Saddle River: Prentice Hall; 2002.
24. Siegelbaum SA, Hudspeth AJ. Principles of neural science. Kandel ER, Schwartz JH, Jessell TM, editors. New York: McGraw-hill; 2000 Jan.
25. Uustal H. Prosthetics and orthotics. InEssential Physical Medicine and Rehabilitation 2006 (pp. 101-118). Humana Press.
26. Wadsworth H, Chanmugam AP. Electrophysical agents in physiotherapy: therapeutic & diagnostic use. Science Press; 1983.
27. Woollacott MH, Shumway-Cook A. Changes in posture control across the life span—a systems approach. Physical therapy. 1990 Dec 1;70(12):799-807.
28. World Confederation for Physical Therapy. WCPT guideline for standards of physical therapy practice.
29. Related scientific publications

NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Proposal in Cardiopulmonary Sciences**
Course Code	**PTH6170**
Academic Year	First
Semester	I
Number of Credits	02
Course Prerequisite	Students should have basic knowledge in research methodology
Course Synopsis	The course is designed to have the student understand the nuances in developing and presenting a research protocol. It will facilitate the student to inculcate skills essential to the identification of a research gap of clinical relevance through a systematic literature search. This course will facilitate the application of research methodology towards the development of a research plan and the use of appropriate outcomes to prove the hypothesis. The course will also equip the student with the knowledge on scientific approvals required prior to initiation of the study in accordance to current regulations for the conduct of the research project.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Demonstrate literature search and develop need for the study (C5, P5)
CO2	Prepare a research proposal and justifies its rationale (C5, P4, A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2		x			x			

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Formulation of research question	1. Prepare search strategy and demonstrate Literature Search (C5, P5) 2. Critically appraise the literature, identify research gap and need for the study (C3, P4)	10
Unit 2:		
Method selection	1. Choose appropriate study design for the research question (C5, P1)	08

Content	Competencies	Number of Hours
	2. Organize procedural steps for implementing the study (C3, P4)	
Unit 3:		
Outcome measures	1. Choose appropriate outcome measure based on research question and psychometric properties (C5, P1) 2. Comply with the process of obtaining permission to use outcome measures from sources/ developers (A2)	08
Unit 4:		
Research proposal document	1. Prepare a research proposal document (P4) 2. Choose appropriate statistical tools and tests (C5)	13
Unit 5:		
Scientific Approvals	1. Proposes research protocol to relevant scientific committee(s) (P5, A3) 2. Justifies the need and rationale for the study to the committee (C5,P4, A3)	13
	Total	**52**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small Group Discussion (SGD)	06	12
Self-directed learning (SDL)	42	-
Assessment	04	08
Total	**52**	**20**

Assessment Methods	
Formative	**Summative**
Presentation	
Research Progress and Conduct	

Mapping of Assessment with COs		
Nature of Assessment	**CO1**	**CO2**
Viva	x	x
Presentations	x	x
Clinical/Practical Log Book/ Record Book	x	x

Feedback Process	Presentation
Main References	1. Research for Physiotherapists: Project Design and Analysis –Caroline Hicks. 2. Foundations of Clinical Research by Leslie Gross Portney 3. Tests, Measurements and Research in Behavioural

	Sciences by A K Singh 4. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

SEMESTER - II

COURSE CODE	**:**	**COURSE TITLE**
EPG6201	**:**	**Ethics and Pedagogy**
PTH6102	**:**	**Foundations of Physiotherapy in Cardiopulmonary Sciences**
PTH6104	**:**	**Physiotherapy Clinical Practice in Cardiopulmonary Sciences - I**
PTH6180	**:**	**Research Progress in Cardiopulmonary Sciences - I**

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Ethics and Pedagogy**
Course Code	**EPG6201**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	NIL
Course Synopsis	The ethics module will help the post graduate students in understanding the ethical principles, identifying the ethical issues and resolving ethical dilemmas in their professional practice with specific focus on clinical and research ethics. The pedagogy of the module will help the post graduate students in understanding the educational philosophy, teaching learning methods and learners' assessment. This module will be delivered in the form of didactic lectures in workshop format and small group learning tutorials, seminars, demonstrations during practical sessions, problem based learning & self-directed learning. Theory examination, assignments and demonstrations will be used to assess the student's transferable skills and learning outcomes.

Course Outcomes (COs): At the end of the course student shall be able to:	
CO1	Apply ethical principles in clinical and research practice (C3)
CO2	Analyse ethical issues and resolve ethical dilemmas (C4)
CO3	Integrate principles of adult learning and various roles of teacher in their academic practice (C2)
CO4	Apply various teaching learning methods (C3, P4)
CO5	Assess students' achievements based on learning outcomes (C3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x			x				
CO2	x			x				
CO3	x			x				
CO4	x	x						
CO5	x			x				

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1: Ethics		
Principles of ethics History and evolution of ethics - Helsinki declaration; Nuremberg Code; Principles of ethics and its importance - Autonomy, Beneficence, Non-maleficence, Justice	1. Outline the history and evolution of bioethics (C2) 2. Explain the cardinal principles of bioethics (C2) 3. Apply national and international bioethical principles (C3)	2
Ethics in professional practice Principles of practice in respective profession. Privacy, confidentiality, shared decision making, informed consent, equality and equity, justice	1. Outline the principles of ethics in professional practice - clinical, research, academics, administrative domains (C2) 2. Apply the principles of ethics in professional practice (C3)	
ICMR Guidelines General principles, Responsible conduct of research, Risk benefit assessment	1. Outline the general principles of ethics for conduct of research based on ICMR guidelines (C2) 2. Summarize the characteristics for responsible conduct of research (C2) 3. Identify potential ethical issues based on risk benefit analysis (C3)	3
Informed Consent Process Components of informed consent document, Procedure in obtaining informed consent, Special situations, waivers, and proxy consent	1. Explain the components and procedures of informed consent process (C2) 2. Apply suitable methods in obtaining informed consent (C3) 3. Distinguish special considerations of informed consent process for waivers and proxy consent (C4)	
Roles and Responsibilities of IEC Ethical Review process, Classification of projects for review, Roles and responsibilities of members, Communications with investigators and authorities	1. Outline the process of ethical review of research proposals (C2) 2. Relate the types of review based on the research project proposals (C2) 3. Summarize the roles and responsibilities of IEC and its members (C2) 4. Organize the mock ethical	2

Content	Competencies	Number of Hours
	review meeting (C3) and examine the research proposal for ethical issues (C4)	
Ethics in Special and Vulnerable Populations Types of Vulnerability and vulnerable population, Challenges for research in vulnerable population, Guidelines for research in special and vulnerable population	1. Define and explain the types of Vulnerability (C2) 2. Outline the characteristics of special and vulnerable population (C2) 3. Summarize the challenges for research in vulnerable population (C2) 4. Apply the ICMR guidelines for research in special and vulnerable population (C3)	2
Conflict of Interest Definition and Types of Conflict of Interest, Identifying, mitigating and managing Conflict of Interest, Conflicts of interest in international collaborations	1. Define and explain the types of Conflict of Interest (C2) 2. Identify and solve potential Conflict of Interest (C3)	3
Publication Ethics Importance of publishing, Authorship guidelines according to ICMJE, Plagiarism	1. List the importance of publishing scholarly works (C4) 2. Examine the criteria of authorship based on ICMJE guidelines (C4) 3. Test the publication for plagiarism (C4)	
Unit 2: Pedagogy		
Principles of adult learning Systems approach in education; Curriculum - Definition, Components, Types of Curriculum (Outcomes-based, Competency-based, Performance-based, Objectives-based), Curricular alignment, Integrated Curriculum, Frameworks, Models (Harden's SPICES model) and approaches (problems-based learning, case-based learning).	1. Relate 'Systems Approach' in education (C2) 2. Define and explain the components of curriculum (C2) 3. Outline the types of curricular frameworks (C2) 4. Identify the characteristics of curricular frameworks (C3)	2
Taxonomy of learning Blooms Taxonomy: Knowledge, Psychomotor and Affective domains, Specific Learning	1. Classify domains of learning (C2) 2. Distinguish the levels of mastery for each learning domains (C4)	2

Content	Competencies	Number of Hours
Objectives - Elements, construction, mapping of SLOs to course outcomes.	3. Outline the elements of specific learning objectives (C3) 4. Organize specific learning objectives based on domains of learning (C3)	
Teaching Methods Small Group Teaching: Group dynamics, Categories of SGT, Facilitating techniques, Generic & Specific SGT methods Large Group Teaching: Lectures	1. Outline small group teaching methods (C3) 2. Explain the generic and specific methods of small group teaching (C3) 3. Outline large group teaching methods (C3) 4. Explain the facilitation methods in large group lectures (C3) 5. Perform microteaching (P4)	5
Learner Assessment Principles, Characteristics and Types of assessment - Formative/Summative, Tools, Blueprinting	1. Outline the principles, characteristics and types of assessment (C3) 2. Identify appropriate tools for assessment. (C3) 3. Construct a blueprint of assessment for theory and practical exam (C3)	5
	Total	**26**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Small group discussion (SGD)	09	18
Assignment / Microteaching	04	08
Total	**26**	**52**

Assessment Methods	
Formative	**Summative**
Unit A	Unit A
Assignments - Clinical Ethics (10); Research Ethics (10);	Sessional Exam: 30 MCQs = 30 marks
Unit B	Unit B
Assignments – Blueprinting (10)	Sessional Exam: 20 MCQs = 20 marks
Presentations – Microteaching sessions (20)	

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester Examination	x	x	x	x	x
Assignments/Presentations	x	x	x	x	x
Feedback Process	Mid-Semester Feedback				
	End-Semester Feedback				
Main References	**UNIT 1: Ethics** 1. Beauchamp and Childress, Principles of Biomedical Ethics, Fourth Edition. Oxford. 1994. 2. Patricia A Marshall. Ethical challenges in study design and informed consent for health research in resource poor settings. World Health Organization. 2007. 3. National Ethical guidelines for Biomedical and Health Research involving human participants. Indian Council of Medical Research. 2017. **UNIT 2: Pedagogy** 1. ABC of Learning and Teaching in Medicine. Editor(s): Peter Cantillon, Diana Wood, Sarah Yardley. Ed: 3 2. Understanding Medical Education: Evidence, Theory, and Practice, Editor(s): Tim Swanwick Kirsty Forrest Bridget C. O'Brien. Ed 3 3. Principles of Medical Education. Editor(s): Tejinder Singh, Piyush Gupta, Daljit Singh. Jaypee Brothers. 2012. NewDelhi.				

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Foundations of Cardiopulmonary Sciences**
Course Code	**PTH6102**
Academic Year	First
Semester	II
Number of Credits	03
Course Prerequisite	Students should have basic knowledge in applied anatomy, physiology and physiotherapeutic skills.
Course Synopsis	The course will focus on the basic core subjects required for the practice of Cardiorespiratory physiotherapy. Students will review and recall the fundamentals of cardiorespiratory physiotherapy and will develop skills required for the implementation of the core skill set in cardiorespiratory physiotherapy through self-directed learning methods, supervised lectures and case-based discussions.

Course Outcomes (COs): At the end of the course student shall be able to:	
CO1	Explain anatomy, physiology and pathophysiology of diseases (C3)
CO2	Outline the evaluations, investigations and pharmacology related to cardiorespiratory physiotherapy (C4)
CO3	Formulate a systematic evaluation and treatment plan (C4)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x							
CO3	x							

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Development, applied anatomy and physiology of the respiratory system in health and disease across lifespan	1. Explain Embryology of the respiratory system (C2) 2. Explain anatomy and physiology of the respiratory system and its application in various diseased states (C4) 3. Explain biomechanics & kinesiology of respiration in health (C4) 4. Relate pathomechanics and altered	14

Content	Competencies	Number of Hours
	kinesiology to disease conditions (C4) 5. Analyze the investigations of the respiratory system: Pulmonary Function test, (Spirometry, Arterial blood gas analysis, Lung diffusion capacity, pulse oximetry, fractional exhaled nitric oxide tests, respiratory muscle strength and endurance assessment), Chest X ray and Computerized tomography scan of the respiratory system (C4)	
Unit 2		
Development, applied anatomy and physiology of the cardiovascular system in health and disease across lifespan	1. Explain embryology (C2) 2. Explain anatomy (including vascular anatomy) and physiology of the cardiovascular system and its application in various diseased states (C4) 3. Analyse the investigations of the cardiovascular system: Electrocardiogram, Echocardiography, Doppler scan, Chest X-ray, angiogram, Holter monitoring (C4)	8
Unit 3		
Pathophysiology of respiratory diseases	1. Explain pathophysiology of various acute and chronic diseases affecting the cardiorespiratory, vascular, neuromuscular, renal and metabolic systems (C3)	2
Unit 4		
Pharmocology in respiratory and cardiovascular systems	1. Explain Pharmacological interventions related to the cardiovascular and respiratory systems (including critical care and pain) (C3)	3
Unit 5		
Multisystem evaluation, assessment and outcome measures	1. Examine multiple systems related to Cardiopulmonary, neurologic, musculoskeletal, metabolic and integumentary system :Cardiopulmonary exercise testing, skin integrity assessment, wound assessment, Muscular strength &endurance, balance (C4)	6
Unit 6		
Cardiorespiratory physiotherapy techniques and therapeutics	1. Appraise physiotherapy techniques and adjuncts for management cardiorespiratory disorders (C4) Breathing retraining Lung expansion therapy Bronchial hygiene therapy	6

Content	Competencies	Number of Hours
	Humidification Oxygen therapy Aerosol therapy 2. Explain methods of documentation in cardiorespiratory physiotherapy (C2)	
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	8	16
Small group discussion (SGD)	12	24
Problem Based Learning (PBL)	6	12
Total	**39**	**78**

Assessment Methods	
Formative	**Summative**
Seminars	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Mid Semester / Sessional Examination 1	x	x	x
End Semester Exam	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Clinical Anatomy by regions; Editor: Richard Snell, 9th Ed; Wolters Kluwer 2. Guyton & Hall Textbook of Medical Physiology by John E. Hall; 13th ed; Elsevier 3. Pathophysiology of Disease: An Introduction to Clinical Medicine by Gary D. Hammer & Stephen McPhee, 7th Ed: McGraw Hill Education 4. Pharmacology in Rehabilitation by Charles D. Ciccone, 4th Ed; Jaypee 5. Wilkin's Clinical Assessment in Respiratory Care by Al Heuer, 8th Ed; Elsevier 6. Examination in Physical Therapy practice: Screening for Medical Disease by William Boissonault, Churchill Livingstone 7. Bate's Guide to physical examination and history taking by Lynn Bickley; 11th Ed; Wolters Kluwer 8. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed, Elsevier 9. Related scientific publications

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	MPT
Course Title	**Physiotherapy clinical practice in Cardiopulmonary Sciences - I**
Course Code	**PTH6104**
Academic Year	First
Semester	II
Number of Credits	12
Course Prerequisite	Students should have basic knowledge in applied anatomy, applied physiology and physiotherapeutic skills.
Course Synopsis	The course will focus on the basic core subjects required for the practice of Cardiorespiratory physiotherapy. Students will review and recall the fundamentals of cardiorespiratory physiotherapy and will develop skills required for the implementation of the core skill set in cardiorespiratory physiotherapy through self-directed learning methods, supervised lectures and case-based discussions.

Course Outcomes (COs):
At the end of the course student shall be able to:

CO1	Analyse and apply the principles of multisystem evaluation, assessment, investigations and outcome measures (C4, P5, A3)
CO2	Plan a skilled and effective subjective and physical examination, select outcome measures, demonstrate clinical decision making in cardiorespiratory Physiotherapy techniques and therapeutics (C3,P5,A3)
CO3	Discuss health related information and display verbal and written communication with patients/ clients, caregivers, peers and health care professionals and ability to work as a team (C3, P5, A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x						x	
CO2		x					x	
CO3				x	x			

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Multisystem evaluation, assessment, investigations and outcome measures	1. Demonstrate physical examination procedures of respiratory system – Lung function, inspiratory muscle strength & endurance; Cardiovascular system – Autonomic control, vascular integrity (C2, P4, A3) 2. Demonstrate physical examination procedures of Cardiopulmonary and metabolic system(Cardiopulmonary exercise testing) integumentary system involving skin integrity breakdown, wound assessment and Neuro musculoskeletal systems – Muscular strength & endurance, balance (disease specific) (C2, P4, A3) 3. Choose validated outcome measures (C3, P5, A2) 4. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 5. Demonstrate the clinical reasoning and decision making process for the management of the patient based on the evaluation (C3, P5, A3) 6. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during evaluation (A4)	282
Unit 2		
Physiotherapy management for cardiorespiratory conditions	1. Organizes problem list and plan short term and long-term goals based on the evaluation findings (C3, P5, A3) 2. Plan and perform Physiotherapy treatment techniques (C3, P5, A3) 3. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 4. Displays ethical and professional behavior (Autonomy, Beneficence and Justice) during treatment (A4)	186
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Self-directed learning (SDL)	36	72
Case Based Learning (CBL)	28	56
Clinic	360	-
Practical	28	56
Assessment	16	32
Total	**468**	**216**

Assessment Methods	
Formative	**Summative**
Case presentations	
Clinical performance	

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Case Presentations	x	x	x
Clinical performance	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Clinical Anatomy by regions; Editor: Richard Snell, 9th Ed; Wolters Kluwer 2. Guyton & Hall Textbook of Medical Physiology by John E. Hall; 13th ed; Elsevier 3. Pathophysiology of Disease: An Introduction to Clinical Medicine by Gary D. Hammer & Stephen McPhee, 7th Ed: McGraw Hill Education 4. Pharmacology in Rehabilitation by Charles D. Ciccone, 4th Ed; Jaypee 5. Wilkin's Clinical Assessment in Respiratory Care by Al Heuer, 8th Ed; Elsevier 6. Examination in Physical Therapy practice: Screening for Medical Disease by William Boissonault, Churchill Livingstone 7. Bate's Guide to physical examination and history taking by Lynn Bickley; 11th Ed; Wolters Kluwer 8. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed, Elsevier 9. Related scientific publications
Additional References	NOTE: This is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Progress in Cardiopulmonary Sciences - I**
Course Code	**PTH6180**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Students should have acquired basic knowledge in research
Course Synopsis	The course is designed to ensure the student is aware of the proper methods of data collection, monitoring and obtaining necessary documentation related to the study (i.e., informed consent). The course will facilitate certification in Good Clinical Practice to ensure research is conducted in accordance to the current regulations and requirements. The course will also motivate the student stay up-to-date with the research in the area of study through regular updates of the literature review.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Explain and demonstrate good clinical practice during research (P5, A3)
CO2	Demonstrate data collection procedures and document maintenance (P4, A4)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1				x		x		
CO2		x	x					

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Good Clinical Practice	1. Explain components of Good Clinical Practice for conducting health related research based on ICMR guidelines (C2, P2, A1)	08

Content	Competencies	Number of Hours
Unit 2:		
Data collection	1. Perform data collection according to the procedure approved by the approval committees (P5, A3)	26
Unit 3:		
Document maintenance	1. Obtain, organize and store the documents relevant to the study e.g. Informed Consent document, Ethical approvals, data collection forms (P4, A4)	06
Unit 4:		
Literature Review update	1. Perform literature search and update the review (P4)	12
	Total	**52**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small Group Discussion (SGD)	10	20
Self-directed learning (SDL)	32	-
Practical	10	-
Total	**52**	**20**

Assessment Methods		
Formative	**Summative**	
Research Progress and Conduct		

Mapping of Assessment with COs:		
Nature of Assessment	**CO1**	**CO2**
Assignments/Presentations		x
Clinical/Practical Log Book/ Record Book	x	

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Research for Physiotherapists: Project Design and Analysis –Caroline Hicks. 2. Foundations of Clinical Research by Leslie Gross Portney 3. Tests, Measurements and Research in Behavioural Sciences by A K Singh 4. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A

SEMESTER - III

COURSE CODE	:	COURSE TITLE
PTH7101	:	Physiotherapy in General Cardiopulmonary Sciences
PTH7103	:	Physiotherapy Clinical Practice in Cardiopulmonary Sciences - II
PTH7105	:	Evidence Based Physiotherapy Practice in Cardiopulmonary Sciences
PTH7170	:	Research Progress in Cardiopulmonary Sciences - II

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	MPT
Course Title	**Physiotherapy in General Cardiopulmonary Sciences**
Course Code	**PTH7101**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Students should have basic knowledge in applied anatomy, physiology and physiotherapeutic skills in cardiopulmonary conditions
Course Synopsis	The course will focus on the application of physiotherapy principles and skills in various conditions while also ensuring a higher level of knowledge and competency in evidence based physiotherapy for assessment and management of various disorders. The course will emphasize the importance of identification of problems through detailed assessment and evaluations using clinical skills and valid outcome measures to develop and formulate appropriate treatment interventions for management of these problems. Skills and knowledge to deal with acute respiratory complications/symptoms, within the scope of physiotherapy practice, will be delivered through this course. Development of skill and expertise in the assessment and management of patients with cancer, wounds/burns, diabetic foot syndrome, kidney disease and acute respiratory illness will be facilitated through the course. Additionally, students will also learn to manage acute pain (postoperative) and chronic pain (neuropathic pain and chronic pain) and evaluate & prescribe appropriate exercises for various chronic conditions (with an emphasis on diabetes, hypertension, obesity and metabolic syndrome)

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Apply knowledge of basis sciences subjects into clinical practice (C3)
CO2	justify multisystem physiotherapy assessment and management of acute and chronic cardiorespiratory dysfunctions in cardiopulmonary physiotherapy (C5)
CO3	evidence based physiotherapy practice for acute and chronic cardiorespiratory dysfunctions (C5)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):								
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2	x	x						
CO3						x	x	

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Exercise Physiology in health and disease across lifespan	2. Explain exercise physiology including cellular physiology and genetic pathways (C4) 3. Explain applied exercise physiology in various acute and chronic diseases across the lifespan (C4)	6
Unit 2:		
Assessment, Monitoring, outcome measures and Clinical reasoning in Cardiorespiratory physiotherapy practice	1. Analyze the clinical reasoning and decision making process for the assessment of following (C3) • Dyspnoea • Fatigue • Impaired airway clearance • Reduced lung volumes and impaired gas exchange • Respiratory muscle dysfunction • Abnormal breathing pattern • Pain • musculoskeletal dysfunction (including postural abnormalities and decrease chest wall compliance) 2. Explain and interpret monitoring methods in cardiorespiratory conditions (C2)	6
Unit 3		
Management and evidence-based physiotherapy in cardiorespiratory physiotherapy practice	1. Apply and justify evidence based cardiorespiratory physiotherapy strategies for following with recent evidence (C5) • Dyspnoea • Fatigue • Impaired airway clearance • Reduced lung volumes and impaired gas exchange • Respiratory muscle dysfunction • Abnormal breathing pattern	4

Content	Competencies	Number of Hours
	• Decreased exercise tolerance • musculoskeletal dysfunction (including postural abnormalities andecrease chest wall compliance) 2. Outline risk management and emergency preparedness (including BLS and ACLS) (C4)	
Unit 4		
Cancer rehabilitation	1. Explain pathophysiology and clinical features of cancer (C4) 2. Explain assessment procedures (including exercise testing and 3. musculoskeletal assessment) for cancer patients (C4) 4. Analyze and apply evidence based exercise interventions for cancer patients with medical, surgical and palliative management (C4)	4
Unit 5		
Burns and wound healing	1. Explain pathology, mechanisms, and clinical features of burns and wounds (conservative – positioning, LASER, hyperbaric oxygen therapy, dressing, Ultrasound therapy, splints and surgical management) (C4) 2. Outline methods to assess wound and burns (C3) 3. Use the evidence based physiotherapy intervention to promote the management of wound (C3)	4
Unit 6		
Diabetic foot	1. Explain pathophysiology, clinical features and complications of diabetic foot (conservative- LASER, offloading tools, hyperbaric oxygen therapy, dressings, ultrasound therapy, splints and surgical management) (C4) 2. Explain how the screening of musculoskeletal and neurological assessment is carried out in Diabetic foot (C3) 3. Outline evidence based physiotherapy interventions (including exercise prescription) and rehabilitation strategies for Diabetic foot (C4)	3

Content	Competencies	Number of Hours
Unit 7		
Renal rehabilitation	1. Explain pathophysiology, clinical features & complications and the management (conservative and surgical) of acute and chronic renal disease (C4) 2. Outline evidence based physiotherapy interventions (including exercise prescription) and rehabilitation strategies for renal disease (C4)	2
Unit 8		
Acute cardiorespiratory care	1. Explain assessment and monitoring of patients on organ support systems (mechanical ventilation, renal replacement therapy, IABP, pacemakers/LVADs, ECMO) (C4) 2. Explain bedside technology (monitoring systems, infusion devices, external temperature control devices, sequential compression decompression devices and bed electronics (C4) 3. Explain primary and secondary complications of acute illness 4. Explain physiotherapy management for prevention and treatment of primary and secondary complications in medical and surgical patients (including pre and post operative management) (C4) 5. Outline the role physiotherapist in interprofessional team approach (C4) 6. Analyze physiotherapy interventions to prevent primary and secondary complications in patients with acute cardiorespiratory care (C4)	3
Unit 9		
Assessment and management of pain in cardiorespiratory and metabolic disorders	1. Explain physiology of pain (C4) 2. Explain pathophysiology of acute and chronic pain (C4) 3. Apply clinical reasoning in choosing appropriate assessment methods of pain (C3) 4. Justify evidence based physiotherapy interventions for pain management	3

Content	Competencies	Number of Hours
	towards in conditions like cancer pain, post- operative pain, neuropathic pain and myalgia (C5)	
Unit 10		
Exercise evaluation and prescription	1. Explain physiological basis and rationale for exercise-based evaluations and interventions (C4) 2. Analyze and interpret exercise evaluation: body composition, strength, flexibility and endurance (C4) 3. Structure an exercise program for following conditions (C4) • Diabetes • HTN • Obesity • Metabolic syndrome	4
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	8	16
Small group discussion (SGD)	12	24
Problem Based Learning (PBL)	2	4
Assessment	4	8
Total	**39**	**78**

Assessment Methods	
Formative	**Summative**
Seminars	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Mid Semester / Sessional Examination 1	x	x	x
Presentations	x	x	x
End Semester Exam	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed,Elsevier 2. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch,

	Victor K. Katch; 7th edition (2010) 3. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016) 4. Physiology of Sport and exercise by Kenney W Larry;Wilmore Jack H; Human Kinetics Illinois 6th ed (2015) 5. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5th Ed, Elsevier (2012) 6. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 7. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 8. Physiotherapy in Respiratory Care: An Evidence based approach to Respiratory and Cardiac Management by Alexandra Hough; 3rd Ed, Nelson Thornes Ltd (2001) 9. Emergency Physiotherapy by Beverley Harden; Churchill Livingstone (2004) 10. Braddom's Physical Medicine and Rehabilitation by Cifu David X et al; 5th Ed, Elsevier (2016) 11. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	MPT
Course Title	**Physiotherapy Clinical Practice in Cardiopulmonary Sciences - II**
Course Code	**PTH7103**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Students should have basic knowledge in applied anatomy, applied physiology and physiotherapeutic skills.
Course Synopsis	This module is designed to apply fundamental and advanced knowledge in therapeutic sciences, demonstrate comprehensive assessment techniques and interpret findings, formulate and prescribe specific treatment plan, conduct a holistic and comprehensive treatment intervention safely and competently, monitor and re-evaluate treatment plans, use problem-solving principles and evidence-based practice in decision making of patient/client management, identify the scope and limitations of professional practices, manage and refer appropriately and communicate effectively in verbal and written forms with patients, their family/caregiver, peers, healthcare professionals and the stakeholders at large

Course Outcomes (COs):
At the end of the course student shall be able to**:**

CO1	Demonstrate physiotherapy assessment and interventions to prevent primary and secondary complications for patients in acute respiratory care (C4, P5, A3)
CO2	Demonstrate evidence based treatment methods addressing dyspnea, airway clearance and lung expansion therapy (C4, P5, A3)
CO3	Discuss health related information and display verbal and written communication with patients/ clients, caregivers, peers and health care professionals and ability to work as a team (C3, P5, A3)
CO4	Demonstrate the assessment procedures and evidence based physiotherapy interventions for patients in dialysis, Diabetic foot, wound and cancer (C4, P5, A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2						x	x	
CO3			x		x			
CO4						x	x	

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Assessment in Acute respiratory care Primary and secondary complication in acute respiratory care Dialysis Diabetic foot Wound Pain	1. Apply the physiotherapy assessment to primary and secondary complications following acute respiratory care (C3, P4, A3) 2. Apply physiotherapy assessment for patients with Dialysis (C3, P4, A3) 3. Screening and demonstrate assessment procedures for diabetic foot (C2, P4, A3) 4. Demonstrate and justify the assessment procedures of wound (C3, P5) 5. Analyse and apply assessment of cancer pain, post operative pain and myalgia (C4, P5, A3) 6. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 7. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during fitness testing and exercise prescription in adolescent girls and female athlete (A4)	282
Unit 2		
Physiotherapy management in cardiopulmonary conditions Primary and secondary complication in acute respiratory care Dialysis Diabetic foot Wound Pain	1. Apply the physiotherapy interventions to prevent primary and secondary complications following acute respiratory care (C3, P4, A3) 2. Construct a structured exercise program for patients with Dialysis (C3, P4, A3) 3. Screening and demonstrate assessment procedures, evidence based physiotherapy interventions of diabetic foot (C2, P4, A3) 4. Demonstrate and justify the assessment procedures of wound and evidence based physiotherapy interventions of wound (C3, P5) 5. Analyse and apply evidence based practice in pain management of cancer pain, post operative pain and myalgia (C4, P5, A3) 6. Organizes problem list and plan short	186

Content	Competencies	Number of Hours
	term and long-term goals based on the evaluation findings (C3, P5, A3) 7. Plan and perform Physiotherapy treatment techniques involving airway clearance technique, lung expansion therapy and dyspnoea management (C3, P5, A3) 8. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 9. Displays ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and treatment of clients. (A4)	
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Self-directed learning (SDL)	36	72
Case Based Learning (CBL)	28	56
Clinic	360	-
Practical	28	56
Assessment	16	32
Total	**468**	**216**

Assessment Methods	
Formative	**Summative**
Case presentations	End Semester Exam
Clinical performance	

Mapping of Assessment with COs				
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**
Case Presentations	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed,Elsevier 2. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch, Victor K. Katch; 7th edition (2010) 3. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016)

	4. Physiology of Sport and exercise by Kenney W Larry;Wilmore Jack H; Human Kinetics Illinois 6th ed (2015) 5. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5th Ed, Elsevier (2012) 6. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 7. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 8. Physiotherapy in Respiratory Care: An Evidence based approach to Respiratory and Cardiac Management by Alexandra Hough; 3rd Ed, Nelson Thornes Ltd (2001) 9. Emergency Physiotherapy by Beverley Harden; Churchill Livingstone (2004) 10. Braddom's Physical Medicine and Rehabilitation by Cifu David X et al; 5th Ed, Elsevier (2016) 11. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Evidence Based Physiotherapy Practice in Cardiopulmonary Sciences**
Course Code	**PTH7105**
Academic Year	Second
Semester	III
Number of Credits	02
Course Prerequisite	Students should have basic knowledge in evidence based physiotherapy practice
Course Synopsis	The course will focus on the development of skill to search for evidence, appraise the available literature and apply the relevant evidence into clinical practice for the physiotherapy assessment and management of cardiopulmonary conditions. Through this course, students will learn to summarise recent trends and developments in cardiopulmonary (including assessment and treatment) by reviewing the scientific literature of the last 5-10 years while emphasizing on landmark studies, high levels of evidence, on-going controversies, on-going studies, and the way forward.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Appraise the process of evidence based practice and implementation to clinical practice (C5)
CO2	Appraise the process of evidence-based practice in cardiopulmonary diseases across life span (C5)
CO3	Appraise the process of evidence-based practice cardiopulmonary diseases (C5)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1						x	x	
CO2	x					x		
CO3	x					x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Evidence based practice	1. Define evidence-based practice (EBP) (C1) 2. Explain the process of evidence-based practice (C4) 3. Adopt a search strategy and appraise the available literature (C5)	**2**

Content	Competencies	Number of Hours
Unit 2		
Evidence based Physiotherapy assessment in cardiopulmonary conditions across life span	1. Identify, appraise and summarize evidence through systematic searches of databases for the assessment of cardiopulmonary diseases across life span (C5) 2. Recommend strategies for implementation of evidence based practice assessment of cardiopulmonary diseases (C5)	**12**
Unit 3		
Evidence based Physiotherapy management in cardiopulmonary conditions	1. Identify, appraise and summarize evidence through systematic searches of databases for management of cardiopulmonary conditions (C5) 2. Recommend strategies for implementation of evidence based management strategies in cardiopulmonary conditions (C5)	**12**
	Total	**26**

Learning Strategies, Contact Hours and Student Learning Time (SLT)			
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**	
Lecture	2	4	
Seminar	24	48	
Total	**26**	**52**	
Assessment Methods			
Formative	**Summative**		
Presentation	Sessional Exam (theory)		
Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Sessional Examination	x	x	x
Assignments/Presentations	x	x	x
Feedback Process	Mid-Semester Feedback		
Main Reference	1. Guide to Evidence Based Physical Therapy Practice by Dianne V Jewell; Jones and Bartlett Publishers (2008) 2. http://www.apta.org/EvidenceResearch/EBPTools/ 3. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html 4. https://www.bmj.com/about-bmj/resources readers/publications/how-read-paper 5. Young JM, Solomon MJ. How to critically appraise an article. Nat Clin Pract Gastroenterol Hepatol. 2009;6(2):82-91 6. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials		

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Progress in Cardiopulmonary Sciences - II**
Course Code	**PTH7170**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Students should have basic knowledge on research project
Course Synopsis	This course is developed to introduce the student to the art of scientific writing. Students will be facilitated to complete a required certification in scientific writing during this time and will be prepared to implement the knowledge from this course into writing their research project. This course will ensure that students continue to adhere to guidelines and good clinical practice recommendations related to enrolment, data collection and storage. The course will enhance the skill of the student to keep abreast with recent developments in the area of study through periodic literature updates.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Explain and components of scientific writing (C2, P2)
CO2	Demonstrate data collection procedures and document maintenance (P4, A4)
CO3	Perform literature search and update (P4)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2			x		x			
CO3		x				x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Basics of scientific writing	1. Explain the components of scientific writing in dissertation and manuscript (C2, P2)	08
Unit 2:		
Data collection	1. Perform data collection according to the procedure approved by the approval committees (P5, A3)	39

Content	Competencies	Number of Hours
Unit 3:		
Document maintenance	1. Obtain, organize and store the documents relevant to the study e.g. Informed Consent document, Ethical approvals, data collection forms (P4, A4)	06
Unit 4:		
Literature update	1. Perform literature search and update the review (P4)	25
	Total	**78**

Learning Strategies, Contact Hours and Student Learning Time (SLT)			
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**	
Small Group Discussion (SGD)	10	20	
Self-directed learning (SDL)	48	-	
Practical	20	-	
Total	**78**	**20**	
Assessment Methods			
Formative	**Summative**		
Research Progress and Conduct			
Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Assignments/Presentations		x	
Clinical/Practical Log Book/ Record Book	x		x
Feedback Process	Mid-Semester Feedback		
	End-Semester Feedback		
Main Reference	1.Research for Physiotherapists: Project Design and Analysis –Caroline Hicks. 2.Foundations of Clinical Research by Leslie Gross Portney 3.Tests, Measurements and Research in Behavioural Sciences by A K Singh 4.Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5.Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6.Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well		

SEMESTER - IV

Option1: Elective in Critical Care Physiotherapy

COURSE CODE	:	COURSE TITLE
PTH7112	:	Critical Care Physiotherapy
PTH7114	:	Clinical Practice in Critical Care Physiotherapy
PTH7180	:	Research project in Cardiopulmonary Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	MPT
Course Title	**Critical Care Physiotherapy**
Course Code	**PTH7112**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in performing planned and unplanned assessments in critically ill patients (with and without supported ventilation) through the appropriate choice of tests. The course will help the student develop expertise in performing rapid and thorough review of investigations to adapt and modify evaluations and interventions for the critically ill patient. It will enhance knowledge and evidence-based practice for providing critical care rehabilitation in the acute and sub-acute settings. The role of physiotherapists in providing care to the critically ill neonate and paediatric client will be touched upon as well. Clinical decision making, and team dynamics will be emphasized through evidence based practice and clinical supervised practical's. Emphasis will be given to safe, ethical practices in the critical care unit and students will be taught to identify potential risks of unsafe practice.

Course Outcomes (COs):
At the end of the course student shall be able to:

CO1	Evaluate and plan a multisystem assessment and management of critically ill patients (C4)
CO2	Appraise and discuss evidence in Physiotherapy assessment, management and rehabilitation of critically ill patients (C5)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1						x	x	
CO2						x	x	

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Basics of critical care units	1. Define critical care (C1) 2. Explain Critical care set up, Equipment, drugs, nutrition and common medical procedures in critical care (C3) 3. Justify the role of physiotherapists in critical care (C5)	4
Unit 2		
Assessment, monitoring, clinical reasoning and outcome measures in Critical Care rehabilitation	1. Evaluate monitoring methods and evaluation of critically ill patients (C5) 2. Justify evaluation methods to Predict and identify critical care complications of the cardiopulmonary, neuromusculoskeletal, vascular and integumentary systems (C5) 3. Explain documentation of initial assessment and daily progress (C3)	6
Unit 3		
Critical Care investigations and its implications for Physiotherapy	1. Examine and Interpret investigations like Arterial blood gas, chest Xray, CT scan, chest ultrasound and Echocardiography (C4) 2. Justify treatment goals and intervention priorities based on physical examination and investigations (C5)	6
Unit 4		
Physiotherapy techniques and rationale	1. Explain rationale and physiological basis for medical and physiotherapy techniques in critically ill patients (C2) 2. Appraise evidence based physiotherapy techniques for optimisation of cardiopulmonary function in critically ill patients involving humidification, oxygen therapy, aerosol therapy, body positioning, lung expansion therapy, Ventilation (invasive and non-invasive) and airway clearance techniques to promote rehabilitation of critically ill patients (C5)	10
Unit 5		
Management of critical care adult patients	1. Explain conditions requiring critical care and their management (medical and surgical) (C3) 2. Apply an evidence based physiotherapy management of an adult patients with	6

Content	Competencies	Number of Hours
	primary and secondary cardiac, pulmonary, musculoskeletal, neurological, vascular and integumentary dysfunctions in critical care units inclusive of care of organ donors, transplant patients, patient on organ supports, epidemics and disaster (C3) 3. Explain rationale, evidence, safety and technique of early mobilization (C3)	
Unit 6		
Critical Care management of neonates, infants and paediatric patients	1. Explain medical and physiotherapy techniques in critically ill neonates, infants and paediatric patients (C3) 2. Explain physiotherapy interventions in the management of neonates, infants and paediatric patients affected with primary and secondary cardiac, pulmonary, musculoskeletal and neurological conditions (C3)	4
Unit 13		
Safety, infection control and ethical considerations in Critical Care practice	1. Appraise the infection control process, risk assessment and emergency management skills: (C3) 2. Explain ethical considerations in critical care practice (C2)	3
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	4	8
Small group discussion (SGD)	12	24
Problem Based Learning (PBL)	6	12
Assessment	4	8
Total	**39**	**78**

Assessment Methods	
Formative	**Summative**
Presentations	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs		
Nature of Assessment	**CO1**	**CO2**
Mid Semester / Sessional Examination 1	x	x
Presentations	x	x
End Semester Exam	x	x

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Nunn's Applied Respiratory Physiology by Andrew B Lumb; 8th Ed, Elsevier (2017) 2. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5 th Ed, Elsevier (2012) 3. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 4. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 5. Physiotherapy in Respiratory Care: An Evidence based approach to Respiratory and Cardiac Management by Alexandra Hough; 3rd Ed, Nelson Thornes Ltd (2001) 6. Emergency Physiotherapy by Beverley Harden; Churchill Livingstone (2004) 7. ICU Book by Paul Mariono; 4th Ed, Wolters Kluwer Health (India) Pvt Ltd (2014) 8. Surgical Critical Care Hand Book: Guidelines for Care of the Surgical Patient in the ICU by Ali Jameel; World Scientific (2016) 9. Critical Care by John M. Oropello, Stephen M. Pastores, Vladimir Kvetan; McGraw Hill Education (2017) 10. Pilbeam's Mechanical Ventilation: Physiological and Clinical Applications by JM Cairo; 6th Ed Elsevier (2016) 11. Clinical application of mechanical ventilation by David Chang; 4th Ed, Cengage Learning India Pvt Ltd (2014) 12. Management of the Mechanically Ventilated Patient by Lynelle B Pierce; 2nd Ed, Elsevier (2007) 13. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials 14. a. Mobilization of intensive care patients: a multidisciplinary practical guide for clinicians. J Multidiscip Healthc. 2016 May 25;9:247-56

Manipal College of Health Professions	
Name of the Department	**Physiotherapy**
Name of the Program	MPT
Course Title	**Clinical Practice in Critical Care Physiotherapy**
Course Code	**PTH7114**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in performing planned and unplanned assessments in critically ill patients (with and without supported ventilation) through the appropriate choice of tests. The course will help the student develop expertise in performing rapid and thorough review of investigations to adapt and modify evaluations and interventions for the critically ill patient. It will enhance knowledge and evidence-based practice for providing critical care rehabilitation in the acute and sub-acute settings. The role of physiotherapists in providing care to the critically ill neonate and paediatric patient will be touched upon as well. Clinical decision making, and team dynamics will be emphasized through evidence based practice and clinical supervised practicals. Emphasis will be given to safe, ethical practices in the critical care unit and students will be taught to identify potential risks of unsafe practice. The course will be delivered through supervised clinical practice.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	To apply fundamental and advanced knowledge in therapeutic sciences (C4, P5, A3)
CO2	To use problem-solving principles and evidence-based practice in decision making of patient/client management (C4, P5, A3)
CO3	To identify the scope and limitations of professional practices, manage and refer appropriately(C4, P5, A3)
CO4	To communicate effectively in verbal and written forms with patients, their family/caregiver, peers, healthcare professionals and the stakeholders at large (C4, P5, A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):								
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1		x			x			
CO2							x	x
CO3			x				x	
CO4				x	x			

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Evaluations in the critically ill neonates, infants, pediatric and adult patient	1. Demonstrate monitoring methods and evaluations in the critically ill patient (C3, P5, A3) 2. Demonstrate physiotherapy assessment of patients with medical and surgical management (C5, P5, A3) 3. Demonstrate Physiotherapy assessment of neonates, infants and paediatric patients affected with cardiac, pulmonary, musculoskeletal and neurological conditions (C5, P5, A3) 4. Demonstrate the use of validated outcome tools (C3, P5, A3) 5. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 6. Display ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	282
Unit 2:		
Management of critically ill neonates, infants, pediatric and adult patients	1. Evaluate and plan a detailed evidence based Physiotherapy assessment and intervention for optimization of cardiopulmonary function in critically ill patients (C5, P5, A3) 2. Demonstrate an evidence based physiotherapy management for patients with medical and surgical management (C5, P5, A3) 3. Demonstrate a detailed evidence based Physiotherapy management of neonates, infants and pediatric patients affected with cardiac, pulmonary, musculoskeletal and neurological conditions (C5, P5, A3) 4. Demonstrate the Safety, infection control and ethical considerations in Critical Care	186

Content	Competencies	Number of Hours
	practice (C3, P5, A3) 5. Demonstrate the use of validated outcome tools (C3, P5, A3) 6. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 7. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT)					
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**			
Self-Directed Learning (SDL)	36	72			
Case Based Learning (CBL)	28	56			
Clinic	360	-			
Revision	28	56			
Assessment	16	32			
Total	**468**	**216**			
Assessment Methods					
Formative	**Summative:**				
Case presentations	End Semester Exam (Practical)				
Clinical performance					
Mapping of Assessment with COs					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	
Case Presentations	x	x	x	x	
Clinical performance	x	x	x	x	
End Semester Exam	x	x	x	x	
Feedback Process	Mid-Semester Feedback				
	End-Semester Feedback				
Main Reference	1. Nunn's Applied Respiratory Physiology by Andrew B Lumb; 8th Ed, Elsevier (2017) 2. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5 th Ed, Elsevier (2012) 3. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 4. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 5. Physiotherapy in Respiratory Care: An Evidence				

	based approach to Respiratory and Cardiac Management by Alexandra Hough; 3rd Ed, Nelson Thornes Ltd (2001) 6. Emergency Physiotherapy by Beverley Harden; Churchill Livingstone (2004) 7. ICU Book by Paul Mariono; 4th Ed, Wolters Kluwer Health (India) Pvt Ltd (2014) 8. Surgical Critical Care Hand Book: Guidelines for Care of the Surgical Patient in the ICU by Ali Jameel; World Scientific (2016) 9. Critical Care by John M. Oropello, Stephen M. Pastores, Vladimir Kvetan; McGraw Hill Education (2017) 10. Pilbeam's Mechanical Ventilation: Physiological and Clinical Applications by JM Cairo; 6th Ed Elsevier (2016) 11. Clinical application of mechanical ventilation by David Chang; 4th Ed, Cengage Learning India Pvt Ltd (2014) 12. Management of the Mechanically Ventilated Patient by Lynelle B Pierce; 2nd Ed, Elsevier (2007) 13. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials 14. a. Mobilization of intensive care patients: a multidisciplinary practical guide for clinicians. J Multidiscip Healthc. 2016 May 25;9:247-56

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Project in Cardiopulmonary Sciences**
Course Code	**PTH7180**
Academic Year	Second
Semester	IV
Number of Credits	05
Course Prerequisite	Students should have advanced knowledge in application of research methodology
Course Synopsis	This course is designed to facilitate the student to apply knowledge in Biostatistics to the data collected through data entry, data analysis and interpretation. The course will develop skills in the use of essential statistical software for the management and analysis of data. The course will also facilitate the application of knowledge of scientific writing into the final submission of the research project. The course will promote the student's ability to justify the study and its findings through both written and spoken methods. It will also sensitize the student to the process of developing a manuscript to a journal. The course will also expose the student to the guidelines on completion of a research project as per prevailing regulatory and institutional norms.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Perform data analysis and interpret results (C4, P4)
CO2	Prepare and submit dissertation document and manuscript (P4)
CO3	Present and defend dissertation (P4,A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2						x	x	
CO3		x	x					

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Data compilation	1. Perform data entry and prepare for analysis in statistical software (P4)	26

Content	Competencies	Number of Hours
Unit 2:		
Statistical analysis	1. Perform appropriate statistical tests and interprets the results (C5,P4) is the student expected to do the analysis	13
Unit 3:		
Dissertation and Manuscript writing	1. Prepare the dissertation document according to institutional guidelines (P4) 2. Prepares manuscript for submission to an indexed journal (P4)	52
Unit 4:		
Dissertation presentation	1. Present and defend the dissertation to the relevant scientific committee(s) (P4, A3)	13
Unit 5:		
Closure report	1. Complete requirements regarding closure of research project (P4)	26
	Total	**130**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small Group Discussion (SGD)	16	32
Self-directed learning (SDL)	80	-
Practical	10	-
Assessment	24	48
Total	**130**	**80**

Assessment Methods	
Formative	**Summative**
Research Progress and Conduct	Presentation and Viva

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Quiz / Viva			x
Assignments/Presentations		x	
Clinical/Practical Log Book/ Record Book	x		
End Semester Exam- Viva			x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Research for Physiotherapists: Project Design and Analysis –Caroline Hicks. 2. Foundations of Clinical Research by Leslie Gross Portney

	3. Tests, Measurements and Research in Behavioural Sciences by A K Singh 4. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

SEMESTER - IV

Option 2: Elective in Cardiopulmonary rehabilitation

COURSE CODE	:	COURSE TITLE
PTH7122	:	Physiotherapy in Cardiopulmonary Rehabilitation
PTH7124	:	Clinical Practice of Physiotherapy in Cardiopulmonary Rehabilitation
PTH7180	:	Research Project in Cardiopulmonary Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	MPT
Course Title	**Physiotherapy in Cardiopulmonary Rehabilitation**
Course Code	**PTH7122**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in evaluating exercise capacity, fitness assessments and physical activity in patients with cardiopulmonary diseases through the appropriate choice of tests. The various of models of delivery for cardiopulmonary rehabilitation will be discussed and methods to integrate technology with rehabilitation will be addressed. Specific assessment and management strategies will be discussed in various cardiovascular and pulmonary conditions which will provide an opportunity for students to implement an individualized rehabilitation program for patients with various cardiopulmonary disorders in accordance to current practice guidelines and available evidence. The importance of prevention (primary, secondary and tertiary) will be emphasized and the various schemes available for this will be covered. The module is designed to provide information about evidence based physiotherapy evaluation and management of patients with cardiopulmonary conditions.

Course Outcomes (COs):
At the end of the course student shall be able to:

CO1	evaluate and plan a multisystem assessment and rehabilitation program for cardiovascular ,pulmonary diseases and chronic diseases (C4)
CO2	Appraise and discuss evidence in Physiotherapy assessment and management for the prevention and rehabilitation of cardiovascular, pulmonary diseases and chronic diseases (C5)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1						x	x	
CO2						x	x	

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Essentials of cardiopulmonary rehabilitation and related outcome measures	1. Recall the history of cardiac and pulmonary rehabilitation across the years. (C1) 2. Explain in details the components of cardiac and pulmonary rehabilitation with reference to different guidelines.(C2) 3. Assess exercise intolerance in cardiopulmonary, vascular and metabolic disease (C5) 4. Explain biochemical primers, genetic factors and circulating microparticles in exercise and their contribution to exercise intolerance (C2)	4
Unit 2		
Clinical Exercise Testing and Prescription	1. Explain various purposes, basic principles and guidelines for health related fitness assessment (C2) 2. Apply FIIT principle for aerobic, muscular and flexibility exercises (C3) 3. Apply an evidence based exercise prescription (C3)	10
Unit 3		
Physical activity for cardiovascular and pulmonary health,	3. Definition of physical activity, its importance in health and disease (C1) 4. Explain theories related to physical activity in adults (C3) 5. Explain the use physical activity through use of validated outcome tools to evaluate physical activity (C4) 6. Appraise strategies to promote physical activity to achieve cardiovascular and pulmonary health (C5)	10
Unit 4		
Prevention of cardiovascular, endocrine, metabolic and pulmonary diseases	1. Outline rationale for primary prevention and demonstrates competency in exercise-based treatments for primary prevention of cardiovascular, endocrine, metabolic and pulmonary diseases(C4) 2. Explain public health programs for cardiovascular and pulmonary diseases in India and globally(C3)	3

Content	Competencies	Number of Hours
Unit 5		
Delivery models of cardiac and pulmonary rehabilitation	1. Justify modes of delivery for cardiovascular and pulmonary rehabilitation involving in-hospital, out-of-hospital, community based, home-based, worksite, telerehab/mHealth (C5)	2
Unit 6		
Evidence based practice in cardiac and pulmonary rehabilitation for secondary and tertiary prevention and for target populations	1. Outline core components of cardiac rehabilitation(C2) 2. Appraise an evidence for cardiac rehabilitation/exercise in coronary artery disease ,post revascularization(medical PCI and CABG),heart failure, valve disease, arrhythmias(atrial fibrillation) , pacemakeres , congenital heart diseases, pulmonary hypertension, peripheral vascular disease and abdominal aortic aneurysm (C5) 3. Appraise the evidence to support practice of cardiac rehabilitation and its guidelines for implementation in India, high income and low middle income countries (C5) 4. Appraise the evidence for implementation of pulmonary rehabilitation/exercise in conditions like COPD,Cor pulmonale, Asthma, bronchiectasis, Interstitial Lung Disease, lung cancer, Obstructive Sleep Apnoea, and post thoracic surgery (C5)	10
Exercise is medicine in chronic disease	1. Explain concept of exercise is medicine (C3) 2. Appraise the role of exercise in long term rehabilitation for chronic diseases (cardiovascular, pulmonary, metabolic and neuromuscular) with multisystem involvement (C5)	
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	4	8
Small group discussion (SGD)	12	24
Problem Based Learning (PBL)	6	12
Assessment	4	8
Total	**39**	**78**

Assessment Methods		
Formative	**Summative**	
Presentations	Mid Semester/Sessional Exam (Theory)	
	End Semester Exam (Theory)	
Mapping of Assessment with COs		
Nature of Assessment	**CO1**	**CO2**
Mid Semester / Sessional Examination 1	x	x
Presentations	x	x
End Semester Exam	x	x
Feedback Process	Mid-Semester Feedback	
	End-Semester Feedback	
Main Reference	1. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed, Elsevier 2. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5th Ed, Elsevier (2012) 3. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 4. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 5. Pulmonary Rehabilitation: Guidelines to Success by John E. Hodgkin et al.; 4th Ed, Mosby (2009) 6. Pulmonary Rehabilitation: An Interdisciplinary Approach by Rachel Garrod; Whurr Publishers Ltd (2004) 7. Training Techniques in Cardiac Rehabilitation by Paul Fardy et al; Human Kinetics Illinois (1998) 8. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 9th Ed, Wolters Kluwer Health Inc (2014) 9. ACSM's Exercise Management for Persons with Chronic Diseases and Disabilities by Geoffrey Moore et al.;4th Ed, Human Kinetics, Illinois (2016) 10. Exercise Leadership in Cardiac Rehabilitation: An Evidence-Based Approach by Morag Thow; Wiley, (2004) 11. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials a. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. Circ Res. 2015;117(2):207-19 12. Spruit M et al. An official American Thoracic Society/European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation.Am J Respir Crit Care Med. 2013;188(8): e13-64c 13. Fletcher GE et al. Exercise standards for testing and training: a scientific statement from the American Heart Association. Circulation. 2013;128(8):873-934	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Clinical Practice of Physiotherapy in Cardiopulmonary Rehabilitation**
Course Code	**PTH7124**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in evaluating exercise capacity, fitness assessments and physical activity in patients with cardiopulmonary diseases through the appropriate choice of tests. The various of models of delivery for cardiopulmonary rehabilitation will be discussed and methods to integrate technology with rehabilitation will be addressed. Specific assessment and management strategies will be discussed in various cardiovascular and pulmonary conditions which will provide an opportunity for students to implement an individualized rehabilitation program for patients with various cardiopulmonary disorders in accordance to current practice guidelines and available evidence. The importance of prevention (primary, secondary and tertiary) will be emphasized and the various schemes available for this will be covered. The course will be delivered through supervised clinical practice

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	To apply fundamental and advanced knowledge in therapeutic sciences (C4, P5, A3)
CO2	To use problem-solving principles and evidence-based practice in decision making of patient/client management (C4, P5, A3)
CO3	To identify the scope and limitations of professional practices, manage and refer appropriately (C4, P5, A3)
CO4	To communicate effectively in verbal and written forms with patients, their family/caregiver, peers, healthcare professionals and the stakeholders at large

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2							x	x
CO3			x		x			
CO4			x		x			

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Clinical Exercise Testing	1. Demonstrate an evidence based health related fitness assessment (C4, P5, A3) 2. Demonstrate a physiotherapy assessment based on physical activity (C4, P5, A3) 3. Demonstrate assessment of post CABG, post valve replacement surgeries, heart failure, congenital heart diseases, pulmonary hypertension and peripheral vascular disease (C5, P5, A3) 4. Demonstrate assessment of following conditions COPD, Cor pulmonale, Asthma, bronchiectasis, Interstitial Lung Disease, lung cancer, Obstructive Sleep Apnoea, and post thoracic surgery 5. Demonstrate the use validated outcome tools (C3, P5, A3) 6. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 7. Display ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	282
Unit 2:		
Evidence based practice in cardiac and pulmonary rehabilitation for secondary and tertiary prevention and for target populations	1. Demonstrate an evidence based exercise prescription for post CABG, post valve replacement surgeries, heart failure, congenital heart diseases, pulmonary hypertension and peripheral vascular disease (C5, P5, A3) 2. Demonstrate an evidence based pulmonary rehabilitation involving exercise program for following conditions COPD, Cor pulmonale, Asthma, bronchiectasis, Interstitial Lung Disease, lung cancer, Obstructive Sleep Apnoea, and post thoracic surgery Demonstrate the use validated outcome tools (C3, P5, A3) 3. Develop an evidence based modes of delivery for cardiac and pulmonary rehabilitation involving in-hospital, out-of-hospital, community based, home-based, worksite, telerehab/mHealth (C3, P5, A3) 4. Plan a detailed evidence based exercise prescription based on physical activity (C4,	186

Content	Competencies	Number of Hours
	P5, A3) 5. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 6. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Self-Directed Learning (SDL)	36	72
Case Based Learning (CBL)	28	56
Clinic	360	-
Revision	28	56
Assessment	16	32
Total	**468**	**216**

Assessment Methods	
Formative	**Summative**
Case presentations	End Semester Exam (Practical)
Clinical performance	

Mapping of Assessment with COs				
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**
Case presentations	x	x	x	x
Clinical performance	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed, Elsevier 2. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5th Ed, Elsevier (2012) 3. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 4. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 5. Pulmonary Rehabilitation: Guidelines to Success by John E. Hodgkin et al.; 4th Ed, Mosby (2009)

	6. Pulmonary Rehabilitation: An Interdisciplinary Approach by Rachel Garrod; Whurr Publishers Ltd (2004) 7. Training Techniques in Cardiac Rehabilitation by Paul Fardy et al; Human Kinetics Illinois (1998) 8. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 9th Ed, Wolters Kluwer Health Inc (2014) 9. ACSM's Exercise Management for Persons with Chronic Diseases and Disabilities by Geoffrey Moore et al.;4th Ed, Human Kinetics, Illinois (2016) 10. Exercise Leadership in Cardiac Rehabilitation: An Evidence-Based Approach by Morag Thow; Wiley, (2004) 11. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials a. Lavie CJ, et al. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. Circ Res. 2015;117(2):207-19 12. Spruit M et al. An official American Thoracic Society/European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation.Am J Respir Crit Care Med. 2013;188(8): e13-64c 13. Fletcher GE et al. Exercise standards for testing and training: a scientific statement from the American Heart Association. Circulation. 2013;128(8):873-934

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Project in Cardiopulmonary Sciences**
Course Code	**PTH7180**
Academic Year	Second
Semester	IV
Number of Credits	05
Course Prerequisite	Students should have advanced knowledge in application of research methodology
Course Synopsis	This course is designed to facilitate the student to apply knowledge in Biostatistics to the data collected through data entry, data analysis and interpretation. The course will develop skills in the use of essential statistical software for the management and analysis of data. The course will also facilitate the application of knowledge of scientific writing into the final submission of the research project. The course will promote the student's ability to justify the study and its findings through both written and spoken methods. It will also sensitize the student to the process of developing a manuscript to a journal. The course will also expose the student to the guidelines on completion of a research project as per prevailing regulatory and institutional norms.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Perform data analysis and interpret results (C4, P4)
CO2	Prepare and submit dissertation document and manuscript (P4)
CO3	Present and defend dissertation (P4,A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2						x	x	
CO3		x	x					

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Data compilation	1. Perform data entry and prepare for analysis in statistical software (P4)	26

Content	Competencies	Number of Hours
Unit 2:		
Statistical analysis	1. Perform appropriate statistical tests and interprets the results (C5,P4) is the student expected to do the analysis	13
Unit 3:		
Dissertation and Manuscript writing	1. Prepare the dissertation document according to institutional guidelines (P4) 2. Prepares manuscript for submission to an indexed journal (P4)	52
Unit 4:		
Dissertation presentation	1. Present and defend the dissertation to the relevant scientific committee(s) (P4, A3)	13
Unit 5:		
Closure report	1. Complete requirements regarding closure of research project (P4)	26
Total		**130**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small Group Discussion (SGD)	16	32
Self-directed learning (SDL)	80	-
Practical	10	-
Assessment	24	48
Total	**130**	**80**

Assessment Methods	
Formative	**Summative**
Research Progress and Conduct	Presentations and Viva

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Quiz / Viva			x
Assignments/Presentations		x	
Clinical/Practical Log Book/ Record Book	x		
End Semester Exam- Viva			x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Research for Physiotherapists: Project Design and Analysis –Caroline Hicks.

	2. Foundations of Clinical Research by Leslie Gross Portney 3. Tests, Measurements and Research in Behavioural Sciences by A K Singh 4. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

SEMESTER - IV

Option 3: Elective in Health Promotion and Fitness

COURSE CODE	:	COURSE TITLE
PTH7132	:	Physiotherapy in Health Promotion and Fitness
PTH7134	:	Clinical Practice of Physiotherapy in Health Promotion and Fitness
PTH7180	:	Research Project in Cardiopulmonary Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Physiotherapy in Health Promotion and Fitness**
Course Code	**PTH7132**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in performing fitness evaluation and physical activity assessments in healthy individuals and among those at risk or with various lifestyle diseases through the appropriate choice of tests. In addition, skills in the choice and use of field tests and sport related evaluations will be delivered through this course. These fitness evaluations will be for both adults, children, and individuals involved in sporting activities. The course will include an in-depth study of how behaviour is related and results in healthy lifestyle and how through various behavioural theories, implementation strategies can be formulated to ensure adherence and motivation to healthy lifestyle. Specific assessment and management strategies will be discussed, which will provide an opportunity for students to implement an individualized rehabilitation program for individuals at risk or with lifestyle diseases in accordance with current practice guidelines and available evidence. Including the worksite as a potential site of delivery of program will be covered and strategies on how to implement such worksite-based programs will be discussed. The importance of primordial and primary prevention will be emphasized.

Course Outcomes (COs):
At the end of the course student shall be able to:

CO1	evaluate and plan a multisystem assessment and management for health promotion and physical fitness (C4)
CO2	appraise and discuss evidence in Physiotherapy assessment, prevention, management for health promotion and physical fitness (C5)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1						x	x	
CO2						x	x	

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1:		
Exercise physiology in health and disease across lifespan	1. Recall acute response and chronic adaptation to exercise (C1) 2. Explain the concepts of fitness and wellness (C2) 3. Assess exercise intolerance health across lifespan and non-communicable diseases (C5) 4. Explain biochemical primers, genetic factors and circulating microparticles in exercise and their contribution to exercise intolerance (C2)	6
Unit 2:		
Exercise Testing and Prescription	1. Justify the fitness assessment methods (health related and performance based assessment) (C5)) 2. Justify rationale for exercise prescription (C5)	**6**
Unit 3		
Exercise Testing and Prescription in special population	1. Justify clinical reasoning for exercise testing and prescription in special populations(C5) 2. Appraise evidence for exercise prescription in special populations across lifespan (C5)	6
Unit 4		
Physical activity measurement for health	1. Define physical activity, its importance in health and disease (C1) 2. Explain theories related to physical activity in adults (C3) 3. Explain the use physical activity through use of validated outcome tools to evaluate physical activity (C4) 4. Appraise strategies to promote physical activity through various sites (Schools, community, worksite) and technologies (mHealth, internet, social media, devices) (C5)	6
Unit 5		
Worksite health and wellness	1. Recall history and description of worksite health and wellness (C1) 2. Justify the strategies on using the workplace as a site for promotion of health and well being for primary, secondary and tertiary prevention (C5)	5

Content	Competencies	Number of Hours
Unit 6		
Evidence based primordial and primary prevention of noncommunicable diseases	1. Justify the strategies used to promote healthy lifestyle in healthy and high-risk individuals to prevent non-communicable diseases (including diabetic foot syndrome) (C5) 2. Appraise evidence- for primordial and primary prevention of non-communicable diseases (including diabetic foot syndrome) (C5)	5
Unit 7		
Evidence based behavioral strategies for promoting health	1. Analyse Behavioural theories related to healthy lifestyle (C4) 2. Discuss the behavioral strategies for promoting and maintaining health (diet, stress, smoking, sedentary behavior) and fitness(C5)	5
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	4	8
Small group discussion (SGD)	12	24
Problem Based Learning (PBL)	6	12
Assessment	4	8
Total	**39**	**78**
Assessment Methods		
Formative	**Summative:**	
Seminars	Mid Semester/Sessional Exam (Theory)	
	End Semester Exam (Theory)	
Mapping of Assessment with COs		
Nature of Assessment	**CO1**	**CO2**
Mid Semester / Sessional Examination 1	x	x
End Semester Exam	x	x
Feedback Process	Mid-Semester Feedback	
	End-Semester Feedback	
Main Reference	1. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch, Victor K. Katch; 7th edition (2010) 2. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016) 3. Physiology of Sport and exercise by Kenney W Larry; Wilmore Jack H; 6th Ed, Human Kinetics	

	Illinois (2015) 4. ACSM's Advanced Exercise Physiology by Peter Farrell et al; 2nd Ed, Human Kinetics Illinois (2012) 5. ACSM's Foundations of Strength Training and Conditioning by Nicholas Ratamess et al; Wolters Kluwer Health Inc (2012) 6. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 9th Ed, Wolters Kluwer Health Inc (2014) 7. ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription by David Swain et al. 7th Ed, Wolters Kluwer Health Inc (2014) 8. Health Promotion Settings: Principles and Practice by Angela Scriven & Margaret Hodgins; Sage Publications (2012) 9. Health Promotion Throughout the Life Span by Carole Edelman et al.; 6th Ed, Elsevier (2006) 10. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials 11. Lobelo F et al. Routine Assessment and Promotion of Physical Activity in Healthcare Settings: A Scientific Statement From the American Heart Association. Circulation.2018;137(18):e495-e522 12. Starth SJ et al. Guide to the assessment of physical activity: Clinical and research applications: a scientific statement from the American Heart Association. Circulation. 2013;128(20):2259-79

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Clinical Practice of Physiotherapy in Health Promotion and Fitness**
Course Code	**PTH7134**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advance knowledge in application of cardiorespiratory physiotherapeutic skills.
Course Synopsis	This course will work towards improving skill, knowledge and competency of the physiotherapist in performing fitness evaluation and physical activity assessments in healthy individuals and among those at risk or with various lifestyle diseases through the appropriate choice of tests. In addition, skills in the choice and use of field tests and sport related evaluations will be delivered through this course. These fitness evaluations will be for both adults, children, and individuals involved in sporting activities. The course will include an in-depth study of how behaviour is related and results in healthy lifestyle and how through various behavioural theories, implementation strategies can be formulated to ensure adherence and motivation to healthy lifestyle. Specific assessment and management strategies will be discussed, which will provide an opportunity for students to implement an individualized rehabilitation program for individuals at risk or with lifestyle diseases in accordance with current practice guidelines and available evidence. Including the worksite as a potential site of delivery of program will be covered and strategies on how to implement such worksite-based programs will be discussed. The importance of primordial and primary prevention will be emphasized. The course will be delivered through supervised clinical practice

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	To apply fundamental and advanced knowledge in therapeutic sciences (C4, P5, A3)
CO2	To use problem-solving principles and evidence-based practice in decision making of patient/client management (C4, P5, A3)
CO3	To identify the scope and limitations of professional practices, manage and refer appropriately (C4, P5, A3)
CO4	To communicate effectively in verbal and written forms with patients, their family/caregiver, peers, healthcare professionals and the stakeholders at large (C4, P5, A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2							x	x
CO3	x	x						
CO4			x		x			

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Clinical Exercise Testing and Prescription	1. Demonstrate physiotherapy assessment of strength, endurance, flexibility and body composition and execute exercise prescription (C4, P5, A3) 2. Demonstrate physiotherapy assessment involving field tests in health, disease and sports (C4, P5, A3) 3. Plan a detailed physiotherapy assessment of speed, agility, balance, reaction time, coordination and power (C4, P5, A3) 4. Demonstrate the use validated outcome tools (C3, P5, A3) 5. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 6. Display ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	282
Unit 2:		
Evidence based primordial and primary prevention of	1. Construct an evidence based Physiotherapy intervention for to promote healthy lifestyle in healthy and high-risk individuals to prevent non-communicable diseases (including	186

Content	Competencies	Number of Hours
noncommunicable diseases	diabetic foot syndrome) (C5, P4, A3) 2. Formulate and apply evidence based behavioral strategies for promoting health including health and fitness counselling (C5, P5, A3) 3. Develop an evidence based exercise prescription based on physical activity (C3, P5, A3) 4. Plan exercise prescription for adult and paediatric population (C4, P5, A3) 5. Evaluate and plan an evidence based strategies on using the workplace as a site for promotion of health and well being for primary, secondary and tertiary prevention (C4, P5, A3) 6. Demonstrate the use validated outcome tools (C3, P5, A3) 7. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 8. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	
	Total	**468**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Self-Directed Learning (SDL)	36	72
Case Based Learning (CBL)	28	56
Clinic	360	-
Revision	28	56
Assessment	16	32
Total	**468**	216
Assessment Methods		
Formative	**Summative**	
Case presentations	End Semester Exam (Practical)	
Clinical performance		

Mapping of Assessment with COs				
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**
Case presentations	x	x	x	x
Clinical performance	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Exercise Physiology: Energy, Nutrition and Human Performance by William McArdle, Frank I. Katch, Victor K. Katch; 7th edition (2010) 2. Essentials of Exercise Physiology by William McArdle et al; Wolters Kluwer Health Inc (2016) 3. Physiology of Sport and exercise by Kenney W Larry; Wilmore Jack H; 6th Ed, Human Kinetics Illinois (2015) 4. ACSM's Advanced Exercise Physiology by Peter Farrell et al; 2nd Ed, Human Kinetics Illinois (2012) 5. ACSM's Foundations of Strength Training and Conditioning by Nicholas Ratamess et al; Wolters Kluwer Health Inc (2012) 6. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 9th Ed, Wolters Kluwer Health Inc (2014) 7. ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription by David Swain et al. 7th Ed, Wolters Kluwer Health Inc (2014) 8. Health Promotion Settings: Principles and Practice by Angela Scriven & Margaret Hodgins; Sage Publications (2012) 9. Health Promotion Throughout the Life Span by Carole Edelman et al.; 6th Ed, Elsevier (2006) 10. Related scientific publications including position statements, guidelines, landmark trials, systematic reviews and meta-analysis and recent trials 11. Lobelo F et al. Routine Assessment and Promotion of Physical Activity in Healthcare Settings: A Scientific Statement From the American Heart Association. Circulation.2018;137(18):e495-e522 12. Starth SJ et al. Guide to the assessment of physical activity: Clinical and research applications: a scientific statement from the American Heart Association. Circulation. 2013;128(20):2259-79

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Cardiopulmonary Sciences)
Course Title	**Research Project in Cardiopulmonary Sciences**
Course Code	**PTH7180**
Academic Year	Second
Semester	IV
Number of Credits	05
Course Prerequisite	Students should have advanced knowledge in application of research methodology
Course Synopsis	This course is designed to facilitate the student to apply knowledge in Biostatistics to the data collected through data entry, data analysis and interpretation. The course will develop skills in the use of essential statistical software for the management and analysis of data. The course will also facilitate the application of knowledge of scientific writing into the final submission of the research project. The course will promote the student's ability to justify the study and its findings through both written and spoken methods. It will also sensitize the student to the process of developing a manuscript to a journal. The course will also expose the student to the guidelines on completion of a research project as per prevailing regulatory and institutional norms.

Course Outcomes (COs)
At the end of the course student shall be able to**:**

CO1	Perform data analysis and interpret results (C4, P4)
CO2	Prepare and submit dissertation document and manuscript (P4)
CO3	Present and defend dissertation (P4,A3)

Mapping of Course Outcomes (COs) to Program Outcomes (POs):

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x	x						
CO2						x	x	
CO3		x	x					

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Data compilation	1. Perform data entry and prepare for analysis in statistical software (P4)	26

Content	Competencies	Number of Hours
Unit 2:		
Statistical analysis	1. Perform appropriate statistical tests and interprets the results (C5,P4) is the student expected to do the analysis	13
Unit 3:		
Dissertation and Manuscript writing	1. Prepare the dissertation document according to institutional guidelines (P4) 2. Prepares manuscript for submission to an indexed journal (P4)	52
Unit 4:		
Dissertation presentation	1. Present and defend the dissertation to the relevant scientific committee(s) (P4, A3)	13
Unit 5:		
Closure report	1. Complete requirements regarding closure of research project (P4)	26
	Total	**130**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small Group Discussion (SGD)	16	32
Self-directed learning (SDL)	80	-
Practical	10	-
Assessment	24	48
Total	**130**	**80**

Assessment Methods	
Formative	**Summative**
Research Progress and Conduct	Presentation and Viva

Mapping of Assessment with COs			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Quiz / Viva			x
Assignments/Presentations		x	
Clinical/Practical Log Book/ Record Book	x		
End Semester Exam- Viva			x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Research for Physiotherapists: Project Design and Analysis –Caroline Hicks. 2. Foundations of Clinical Research by Leslie Gross Portney

	3. Tests, Measurements and Research in Behavioural Sciences by A K Singh 4. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt 5. Rehabilitation Research - E-Book: Principles and Applications by Russell Carter, Jay Lubinsky, et al. 6. Essentials of Research Methodology for all Physiotherapy and Allied Health Sciences Students by Ramalingam Thangamani A NOTE: this is not an exhaustive list of references and there will be other textbooks and articles which should be referenced as well

7. Program Outcomes (POs) and Course Outcomes (COs) Mapping

Sem.	Course Code	Course Title	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
I	**ABS6101**	Advanced Biostatistics & Research Methodology	4	CO1 CO2 CO3 CO4 CO5					CO2	CO4	
I	**PTH6001**	Principles of Physiotherapy Practice	3	CO1 CO2 CO3 CO4 CO5					CO4 CO5		CO1
I	**PTH6003**	Clinical Practice in Physiotherapy	12		CO1 CO2 CO3 CO4		CO1 CO2 CO4		CO3		
I	**PTH6170**	Research Proposal in cardiopulmonary sciences Physiotherapy	2	CO1	CO1 CO2			CO2			
II	**EPG6201**	Ethics and Pedagogy	2	CO1 CO2 CO3 CO4 CO5	CO4		CO1 CO2 CO3 CO5				
II	**PTH6102**	Foundations of Physiotherapy in Cardiopulmonary sciences	3	CO1 CO2 CO3	CO1 CO2 CO3						
II	**PTH6104**	Physiotherapy clinical practice in Cardiopulmonary sciences-I	12	CO1	CO2		CO3	CO3		CO1 CO2	
II	**PTH6180**	Research progress in cardiopulmonary sciences-I	2		CO2	CO2	CO1		CO1		
III	**PTH7101**	Physiotherapy in general Cardiopulmonary sciences	3	CO1 CO2	CO1 CO2						
III	**PTH7103**	Physiotherapy clinical practice in cardiopulmonary sciences –II	12	CO1	CO1	CO3		CO3	CO2 CO4	CO2 CO4	

Sem.	Course Code	Course Title	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
III	**PTH7105**	Evidence based physiotherapy practice in cardiopulmonary sciences	2	CO2 CO3					CO1 CO2 CO3	CO1	
III	**PTH7170**	Research Progress in cardiopulmonary sciences –II	3	CO1	CO1 CO3	CO2		CO2	CO3		
IV	**PTH7112**	Physiotherapy in critical care physiotherapy	3						CO1 CO2	CO1 CO2	
IV	**PTH7114**	Clinical Physiotherapy in critical care Physiotherapy	12		CO1	CO3	CO4	CO1 CO4		CO2 CO3	CO2
IV	**PTH7180**	Research project in cardiopulmonary sciences	5	CO1	CO1 CO3	CO3			CO2	CO2	
IV	**PTH7122**	Physiotherapy in cardiopulmonary rehabilitation	3						CO1 CO2	CO1 CO2	
IV	**PTH7124**	Clinical Physiotherapy in cardiopulmonary rehabilitation	12	CO1	CO2	CO3 CO4		CO3 CO4		CO2	CO2
IV	**PTH7180**	Research project in cardiopulmonary sciences	5	CO1	CO1 CO3	CO3			CO2	CO2	
IV	**PTH7132**	Physiotherapy in Health Promotion and Fitness	3						CO1 CO2	CO1 CO2	
IV	**PTH7134**	Clinical Physiotherapy in Health Promotion and Fitness	12	CO1 CO3	CO1 CO3	CO4		CO4		CO2	CO2
IV	**PTH7180**	Research project in cardiopulmonary sciences	5	CO1	CO1 CO3	CO3			CO2	CO2	

8. MCHP PG PROGRAM REGULATION

1. Program Structure

1.1. The program offers a semester based credit system (with few programs offering specialization too).

1.2. An academic year consists of two semesters – Odd semester (July - December) and Even semester (January – June)

1.3 Each semester shall extend over a minimum period of 13 weeks of academic delivery excluding examination days, semester breaks, declared holidays and non-academic events.

1.4 Medium of instruction shall be in English

2 Credit Distribution

2.1 Each semester has minimum 13 weeks of contact sessions. One credit = 13 hours. The credit distribution hours for Lecture, Tutorial, Practical, Clinics and Project are as follows:

Lecture (L)	:	1 Hour /week = 1 credit
Tutorial (T)	:	1 Hour /week = 1 credit
Practical/Project (P/PR)	:	2 Hours/week = 1 credit
Clinics (CL)	:	3 Hours/week = 1 credit

2.2 A semester has courses structured as theory, practical, and clinics. Each course is of minimum 2 credits. The maximum credits for theory course is 4; theory and practical combined is 5.

3 Attendance

3.1 Minimum attendance requirements for each course is:

i. Theory : 85 %

ii. Clinics / Practical : 90 %

3.1 As per the directives of MAHE, there will be no consideration for leave on medical grounds. The student will have to adjust the same in the minimum prescribed attendance.

3.2 Students requiring **leave** during the academic session should apply for the same through a formal application to the Head of Department through their respective Class In-charge/ Coordinator. The leave will be considered as absent and reflected in their attendance requirements.

3.3 No leverage will be given by the department for any attendance shortage.

3.4 Students, Parents/ guardians can access the attendance status online periodically. Separate intimation regarding attendance status would not be sent to parents/students.

3.5 Students having attendance shortage in any course (theory & practical) will not be permitted to appear for the End-semester exam (ESE) of the respective course.

4 Examination

4.1 Exams are in two forms – Sessional examination (conducted as a part of internal assessment) and End semester examination.

4.2 The final evaluation for each course shall be based on Internal Assessment Components (**IAC**) and the End-semester examinations **(ESE)** based on the weightage (as indicated in clause 5.1) given for respective courses.

4.3 IAC shall be done on the basis of a continuous evaluation after assessing the performance of the student in mid semester exam, class participation, assignments, seminars or any other component as applicable to a course.

4.4 All the ESE for the odd semesters **(regular ESE)** will be conducted in November-December. All the ESE for the even semesters **(regular ESE)** will be conducted in May-June.

4.5 For those whose failed to clear any course during regular ESE, a **supplementary/make up exam** is conducted 2 weeks immediately after the ESE result declaration to enable him / her to earn those lost credits. A nominal fee as per MAHE rules will be applicable during this examination.

4.6 For core courses, the duration of ESE for a 2 credit course would be 2 hours (50 marks) and for a course with 3 or more credits, 3 hours (100 marks). For program elective course, the exam duration is 3 hours (100 marks).

5. Weightage for Internal Assessment Component (IAC) and End Semester Exam (ESE)

5.1 Any one or a combination of marks distribution criteria applicable to a course.

IAC Weightage (%)	ESE Weightage (%)
30	70
50	50
100	Nil
Nil	100

6. Minimum Requirements for Pass

6.1. Pass in a course will be reflected as grades. No candidate shall be declared to have passed in any course unless he/she obtains not less than **"E" grade**

6.2. For all courses (core / non-core), candidate should obtain a minimum of 50% (ESE) to be declared as pass.

6.3 When a student appears for **supplementary examination**, the maximum grade awarded is "C" grade or below irrespective of their performance.

6.4. For students who fail to secure a minimum of 'E' grade for a course, an **improvement examination** is conducted to improve their IAC marks. The student can appear for these examination along with the subsequent batches' mid semester / sessional exams. The marks obtained in other components of IAC can be carried forward without reassessment. A nominal fee is charged as per MAHE for per course of improvement in IAC.

7. Calculation of GPA and CGPA

7.1. Evaluation and Grading (**Relative Grading**) of students shall be based on GPA (Grade Point Average) & CGPA (Cumulative Grade Point Average).

7.2. The overall performance of a student in each semester is indicated by the Grade Point Average (GPA). The overall performance of the student for the entire program is indicated by the Cumulative Grade Point Average (CGPA).

7.3. A ten (10) point grading system **(credit value)** is used for awarding a letter grade in each course.

Letter Grade	A+	A	B	C	D	E	F/I/DT
Grade points	10	9	8	7	6	5	0

DT – Detained/Attendance shortage, I – Incomplete

7.4 Calculation of GPA & CGPA: An example is provided

Course code	Course	Credits (a)	Grade obtained by the student	Credit value (b)	Grade Points (a x b)
AHS 101	Course - 1	4	B	8	32
AHS 103	Course - 2	4	B	8	32
AHS 105	Course - 3	3	A+	10	30
AHS 107	Course - 4	4	C	7	28
AHS 109	Course - 5	5	A	9	45
TOTAL		**20**	**-**	**-**	**167**

1st Semester GPA = Total grade points / total credits

167/20 = **8.35**

Suppose in **2nd semester GPA** = **7** with respective course credit 25

$$\text{Then, } \textbf{1st Year CGPA} = \frac{(8.35 \times 20) + (7 \times 25)}{20 + 25} = 7.6$$

8. Progression Criteria to higher semesters

8.1 There is no separate criteria / credits required in order to be promoted to the next academic year.

8.2 However, in order to be eligible to appear for fourth semester (Theory / practical / project submission), the student should have cleared all his previous semesters (i.e. first, second and third).

8.4 The student must complete all the course work requirements by a **maximum of double the program duration**. For e.g. 2 years' program, all the academic course work needs to be completed within 4 years. Failure to do so will result in exit from the program.

9. Semester Break

9.1 Students will have a short semester break following their odd and even end-semester examinations.

10. Project / Dissertation

10.1 Project / Dissertation will carry credits and marks (as applicable to each program)

10.2 Final copy of dissertation **(e-copy)** to be submitted by end of March for plagiarism check and submission to University. A **single hardcopy (student copy)** of the dissertation to be prepared and presented before the external examiner during the viva-voce.

10.3 **Manuscript** format of the thesis also to be submitted to the respective guides / dept.

11. Award of Degree

11.1 Degree is awarded only on **successful completion of entire coursework**.

Head of the Department **Dean**

Deputy Registrar - Academics **Registrar**