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

(Musculoskeletal 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 Musculoskeletal 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 musculoskeletal system. Postgraduates will have job opportunities in various acute care 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 (Musculoskeletal 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, and assess problems to formulate 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 deliver 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

S No.	Attribute	Description
		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 (Musculoskeletal 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
PTH6470	Research Proposal in Musculoskeletal Sciences Physiotherapy	-	-	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
PTH6402	Foundations of Physiotherapy in Musculoskeletal Sciences	1	2	-	-	3	50	50	100
PTH6404	Physiotherapy Clinical Practice in Musculoskeletal Sciences - I	-	-	-	36	12	100	-	100
PTH6480	Research Progress in Musculoskeletal Sciences - I	-	-	4	-	2	100	-	100
Total		**2**	**3**	**4**	**36**	**19**	**350**	**50**	**400**
Note: PTH6402 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
PTH7401	Physiotherapy in General Musculoskeletal Sciences	1	2	-	-	3	50	50	100
PTH7403	Physiotherapy Clinical Practice in Musculoskeletal Sciences - II	-	-	-	36	12	50	50	100
PTH7405	Evidence Based Physiotherapy Practice in Musculoskeletal Sciences	1	1	-	-	2	100	-	100
PTH7470	Research Progress in Musculoskeletal Sciences - II	-	-	6	-	3	100	-	100
	Total	**2**	**3**	**6**	**36**	**20**	**300**	**100**	**400**

Note:
PTH7401 will be conducted for 100 marks and normalized to 50 marks
PTH7403 will be conducted for 100 marks and normalized to 50 marks

SEMESTER - IV

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

Option-1: Elective in Musculoskeletal Sciences - Manual Therapy

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7412	Manual Therapy	1	2	-	-	3	50	50	100
PTH7414	Clinical Practice in Manual Therapy	-	-	-	36	12	50	50	100
PTH7480	Research Project in Musculoskeletal Sciences	-	-	10	-	5	50	50	100
	Total	**1**	**2**	**10**	**36**	**20**	**150**	**150**	**300**

Note:
PTH7412 will be conducted for 100 marks and normalized to 50 marks
PTH7414 will be conducted for 100 marks and normalized to 50 marks

Option-2: Elective in Musculoskeletal Sciences – Sports Physiotherapy

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7422	Sports Physiotherapy	1	2	-	-	3	50	50	100
PTH7424	Clinical Practice in Sports Physiotherapy	-	-	-	36	12	50	50	100
PTH7480	Research Project in Musculoskeletal Sciences	-	-	10	-	5	50	50	100
Total		**1**	**2**	**10**	**36**	**20**	**150**	**150**	**300**

Note:
PTH7422 will be conducted for 100 marks and normalized to 50 marks
PTH7424 will be conducted for 100 marks and normalized to 50 marks

Option-3: Elective in Musculoskeletal Sciences – Hand Rehabilitation

Course Code	Course Title	Credit Distribution (hours/week)					Marks Distribution		
		L	T	P	CL	CR	IAC	ESE	Total
PTH7432	Hand Rehabilitation	1	2	-	-	3	50	50	100
PTH7434	Clinical Practice in Hand Rehabilitation	-	-	-	36	12	50	50	100
PTH7480	Research Project in Musculoskeletal Sciences	-	-	10	-	5	50	50	100
Total		**1**	**2**	**10**	**36**	**20**	**150**	**150**	**300**

Note:
PTH7432 will be conducted for 100 marks and normalized to 50 marks
PTH7434 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

Theoretical courses		Courses on Clinical Practice/Practical		Research Project	
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
PTH6470	:	Research Proposal in Musculoskeletal Physiotherapy

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal 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		
	• Define statistics (C1) • List the uses of statistics in health science research. (C1) • Explain the role of Statistics in clinical and preventive Medicine. (C2) • Differentiate qualitative and quantitative variables with	**4**

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

Content	Competencies	Number of Hours
	difference between two means, proportion, difference between two proportions (large sample approximation) (C5)	
Unit 3		
	• Define /explain with example the concept of null hypothesis, alternative hypothesis, type I and type II errors. (C2) • Define level of significance, power of the test and p-value (C1) • Explain the difference between one sided and two-sided test (C2) • Give the situation for non-parametric tests. (C2) • List the differences, merits and demerits of non-parametric over parametric tests. (C1)	**4**
	• Explain the situation, hypothesis tested, assumptions and example for paired and unpaired t-test. (C2) • Interpret the output of paired and unpaired t-test (C4) • Explain the situation, hypothesis tested, assumptions and example for one-way and repeated measures ANOVA (C2)	**3**
	• 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) • Explain the situation, hypothesis tested, assumptions and example for Chi square test association/independence and McNemar's test for association (C2) Computation and interpretation of chi-square test (2 x2 table) and McNemar's test result (C2)	**4**
	• Give example for positive and negative correlations. (C2) • Explain different types of correlation with the help of scatter diagrams. (C2) • Give the assumptions, properties, and interpretation of correlation coefficient.(C4) • Explain the situation for the computation of Pearson's and Spearman's correlation coefficient. (C2) • Interpret coefficient of determination.(C4) • Explain the situation, example, application and assumptions for linear and multiple regression.(C2) • Interpret regression coefficients in simple and multiple regression.(C4) • Explain the need for sample size computation.(C2) • Given the situation/ingredients, should be able to	**4**

Content	Competencies	Number of Hours
	determine sample size for estimating mean and proportion, testing of difference in means and proportions of two groups.(C5)	
	• Explain the difference between rate, ratio, and proportion with example. (C2) • Calculate rate, ratio, and proportion (C4) • Define and calculate Incidence and prevalence rates.(C4) • Explain the design, merits and demerits of Case report, case series analysis, prevalence studies and ecological studies with example (C2)	**3**
	• 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) • Explain the design, analysis (2x2 table and relative risk), merits and demerits of cohort study with example.(C2)	**3**
	• Explain confounding with example. (C2) • List the methods to deal with confounding at design and analysis stage.(C1) • Explain the design, analysis, merits and demerits of RCT with example. (C2) • Explain the need of simple, block and stratified randomization with example.(C2) • Explain the need and type of blinding with example (C2)	**4**
	• Explain the situation for the use of logistic regression and survival analysis with example.(C2)	**3**
	• Define Population, sample, sampling, and sampling frame. Give one example each.(C1) • List the characteristics of a good sample.(C1) • Differentiate and list the advantages and disadvantages of random and non- random sampling techniques.(C4) • Explain simple, stratified, systematic, cluster and multistage random sampling techniques with examples. List the merits and demerits of each of them.(C2) • Explain Convenience, quota, judgment and snowball sampling with examples. List the merits and demerits of each of them.(C2) • 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)	**4**
	• Define Sensitivity, specificity, PPV and NPV. (C1) • Explain with example method of computation and interpretation. (C4)	**4**

Content	Competencies	Number of Hours
	• Explain with example, the situation for the application of Bland Altman plot, Kappa statistic. (C2) • Explain the interpretation of Kappa Statistics. (C2) • Explain the format of various research documents. (C2)	
	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 (Musculoskeletal 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) 3. Explain motor learning and theories of Motor Learning (C4)	02

Content	Competencies	Number of Hours
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 cardiopulmonary rehabilitation (C4)	02

Content	Competencies	Number of Hours
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 (Musculoskeletal 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, P4, 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, P4, 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**
Assignments/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 (Musculoskeletal Sciences)
Course Title	**Research Proposal in Musculoskeletal Sciences**
Course Code	**PTH6470**
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

Content	Competencies	Number of Hours
Unit 2		
Method selection	1. Choose appropriate study design for the research question (C5, P1) 2. Organize procedural steps for implementing the study (C3, P4)	08
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
PTH6402	:	Foundations of Physiotherapy in Musculoskeletal Sciences
PTH6404	:	Physiotherapy Clinical Practice in Musculoskeletal Sciences - I
PTH6480	:	Research Progress in Musculoskeletal Sciences - I

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal 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 review meeting (C3) and examine the research proposal for ethical issues (C4)	2
Ethics in Special and Vulnerable Populations	1. Define and explain the types of Vulnerability (C2)	2

Content	Competencies	Number of Hours
Types of Vulnerability and vulnerable population, Challenges for research in vulnerable population, Guidelines for research in special and vulnerable population	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)	
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 Objectives - Elements, construction, mapping of SLOs to course outcomes.	1. Classify domains of learning (C2) 2. Distinguish the levels of mastery for each learning domains (C3) 3. Outline the elements of specific learning objectives (C3) 4. Organize specific learning objectives based on domains of learning (C3)	2
Teaching Methods Small Group Teaching: Group	1. Outline small group teaching methods (C3)	5

Content	Competencies	Number of Hours
dynamics, Categories of SGT, Facilitating techniques, Generic & Specific SGT methods Large Group Teaching: Lectures	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)	
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 (Musculoskeletal Sciences)
Course Title	**Foundations of Physiotherapy in Musculoskeletal Sciences**
Course Code	**PTH6402**
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	This module is designed To understand and apply the principles biomechanics, tissue healing and repair in the evaluation and management of musculoskeletal conditions To integrate the knowledge of pain sciences and exercise prescription in the management of musculoskeletal dysfunction

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

CO1	Apply the knowledge of anatomy, applied Biomechanics and Pathomechanics of basic connective tissues in Musculoskeletal systems and the physiological changes occurring in healing and repair(C5)
CO2	Formulate and apply the principles of physiotherapy evaluation and management in Musculoskeletal conditions. (C5,P4)
CO3	Apply the knowledge of pain sciences in the assessment and management of clients musculoskeletal conditions (C5)
CO4	Conduct functional exercise testing and plan effective intervention strategies for clients (C4)
CO5	Explain the role of therapeutic movement in exercise sciences and physiological basis for exercise in musculoskeletal sciences. (C5)

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		
Healing and Repair	1. Outline the stages of tissue healing and recovery following musculoskeletal dysfunction (C2) 2. Explain the normal response to loading and unloading on basic and specific connective tissues (C5) 3. Outline the remodeling /repair stages of bone, skeletal muscle, tendon, articular cartilage, ligaments and neural tissue (C2) 4. Choose intervention strategies based on the mechanobiology of the specific connective tissue (C5)	3
Unit 2		
Functional Anatomy and Applied Biomechanics of Musculoskeletal system	1. Explain biomechanics of human movement, gait and posture (C5) 2. Apply the knowledge of functional anatomy and biomechanics in the assessment and management of musculoskeletal disorders (C3)	3
Unit 3		
Pathomechanics of human movement	1. Analyse the pathomechanics of joints and human movement (C4) 2. Explains the impact of pathomechanics in human movement on development of musculoskeletal dysfunction, tissue healing and recovery (C5)	2
Unit 4		
Physiological basis for exercise in Musculoskeletal disorders	1. Explain the physiological response to exercise in the musculoskeletal system (C5) 2. Identify risk and benefits of exercise (C3) 3. Explain evaluation methods for exercise prescription in musculoskeletal disorders (C5) 4. Compare various exercise recommendations in chronic musculoskeletal conditions (C4) 5. Construct exercise program for individuals with musculoskeletal disorders (C3)	3
Unit 5		
Pain Sciences	1. Summarize the anatomy and physiology of the nociceptive pathway(central, peripheral and autonomic) (C2) 2. Explain the systems involved in the transition from acute to chronic pain (C5)	5

Content	Competencies	Number of Hours
	3. Explain the process of peripheral and central sensitization (C5) 4. Outline models of pain (C2) 5. Identify risk factors for the development of chronic pain conditions (C3) 6. List the tools for the identification of acute and chronic pain sensitivity in musculoskeletal pain(C4) 7. Explain the peripheral and central processes in pain modulation (C5) 8. Explain the implications of pain sensitivity in the management of musculoskeletal pain (C2) 9. Construct physiotherapy intervention strategies for patients with acute and chronic pain (C3)	
Unit 6		
Musculoskeletal Physical Assessment	1. Assesses musculoskeletal system (C5,P3) 2. Applies appropriate assessment tools and outcome measures in musculoskeletal evaluation (C3,P3) 3. Performs gait and posture evaluation (P4) 4. Applies biopsychosocial and contextual factors in patient evaluation and treatment strategies (C3) 5. Performs movement examination to Identify and differentiate the structure at fault (P4)	13
Unit 7		
Principles of functional testing and progression	1. Outline the need for functional testing and progression (C2) 2. Identify the benefits of functional progression program (C3) 3. Explain functional testing for the upper ,lower extremities and spine (C5) 4. Construct functional testing and progression for patients (C3)	4
Unit 8		
Principles and Techniques in Musculoskeletal Rehabilitation	1. Explain the techniques used in the treatment of musculoskeletal disorders (C5) 2. Choose basic physical examination procedures for identifying impairments in musculoskeletal dysfunction (C5) 3. Choose, a specific outcome measures based on client presentation (C5) 4. Apply the principles of treatment interventions in the management of musculoskeletal conditions (C3) 5. Apply clinical reasoning and decision making	4

Content	Competencies	Number of Hours
	process for the management of patients (C3)	
Unit 9		
Medico legal issues in musculoskeletal science	1. Explain aspects of confidentiality in medico legal cases (C2) 2. Outline the medico legal issues in sports physiotherapy (C1) 3. Outline the medico legal issues in manual therapy (C1)	2
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)						
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**				
Lecture	13	26				
Seminar	12	24				
Small group discussion (SGD)	4	8				
Problem Based Learning (PBL)	4	8				
Case Based Learning (CBL)	2	4				
Revision	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**	**CO4**	**CO5**	
Mid Semester / Sessional Examination 1	x	x	x	x	x	
End Semester Exam	x	x	x	x	x	
Feedback Process	Mid-Semester Feedback					
	End-Semester Feedback					
Main Reference	1. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011. 2. Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams & Wilkins; 2001. 3. Neumann DA. Kinesiology of the Musculoskeletal System-E-Book: Foundations for Rehabilitation. Elsevier Health Sciences; 2013. 4. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences; 2014. 5. Hoppenfeld S, Hutton R, Hugh T. Physical examination of the spine and					

	extremities. New York: Appleton-Century-Crofts; 1976. 6. Aronoff GM, editor. Evaluation and treatment of chronic pain. Lippincott Williams & Wilkins; 1999. 7. Hislop H, Avers D, Brown M. Daniels and Worthingham's Muscle Testing-E-Book: Techniques of Manual Examination and Performance Testing. Elsevier Health Sciences; 2013. 8. Kendall FP, McCreary EK, Provance PG, Rodgers MM, Romani WA. Muscles: Testing and Function, with Posture and Pain (Kendall, Muscles). Philadelphia: Lippincott Williams & Wilkins; 2005. 9. Norkin CC, White DJ. Measurement of joint motion: a guide to goniometry. FA Davis; 2016 Nov 18. 10. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. 11. Hall CM, Brody LT. Therapeutic exercise: moving toward function. Lippincott Williams & Wilkins; 2005. 12. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013. 13. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E-Book. Elsevier Health Sciences; 2013. 14. Wittink H, Michel TH, editors. Chronic pain management for physical therapists. Butterworth-Heinemann Medical; 2002. 15. Tippett SR, Voight ML. Functional progressions for sport rehabilitation. Human Kinetics; 1995. 16. Moir G. Strength and Conditioning. Jones & Bartlett Publishers; 2015 Feb 27. 17. Thomas RB, Roger WE. Essentials of strength training and conditioning. National strength and Conditioning Association. 2000:393-427. 18. McMurray RG. Concepts in fitness programming. CRC Press; 1998 Dec 23
Additional References	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 (Musculoskeletal Sciences)
Course Title	**Physiotherapy Clinical Practice in Musculoskeletal Sciences - I**
Course Code	**PTH6404**
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	This course will offer information and hands on training for principles of assessment and techniques used in physiotherapeutic management of musculoskeletal pain and movement disorders. This course will be delivered in the form of lectures, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised clinical practice and self-directed and problem 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	Plan a skilled and effective subjective and physical examination, demonstrate clinical decision making and perform physiotherapy management of a patient with acute and chronic pain for Improving and maintaining optimal functional independence and physical performance (C3,P5,A3)
CO2	Analyse and apply the principles of physiotherapy evaluation and management in Musculoskeletal conditions. (C3,P5,A3)
CO3	Apply outcome measures in the evaluation and management of Musculoskeletal disorders. (C3,P5,A3)
CO4	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 with ethical principles during assessment and treatment. (C3,P5,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					
CO3	x			x				
CO4			x		x			

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Physiotherapy assessment for musculoskeletal conditions	1. Explain the International classification of Functioning, Disability and Health.(C2) 2. Apply Hypothesis Oriented approach in the assessment of spine and Temporomandibular Join disorders (C3.P4,A3) 3. Apply Hypothesis Oriented approach in the assessment of upper extremity and lower extremity disorders (Upper and lower Quadrant dysfunction)(C3, P4,A3) 4. Demonstrate the clinical reasoning and clinical decision making process for developing and implementing preventative therapeutic courses of intervention of the patient based on the evaluation (C3, P5, A3) 5. Demonstrate physical examination procedures in various Spine and Temperomandibular Joint using diagnostic and assessment procedures and tools. (C2, P5, A3) 6. Choose outcome measures relevant to Spinal and Temporomandibular joint dysfunctions (C3, P5, A2) 7. Choose outcome measures relevant to Musculoskeletal disorders of extremities (C3, P5, A2) 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. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during evaluation (A4)	190
Unit 2		
Pain evaluation and management	1. Plan a comprehensive physical examination, demonstrate clinical decision making and perform physiotherapy management of a patient with acute and chronic pain (C3, P5, A3) 2. Choose validated outcome measures for pain measuring tools (C3, P5, A2) 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. Display ethical and professional behavior (Autonomy, Beneficence and Justice) during evaluation (A4)	88

Content	Competencies	Number of Hours
Unit 3		
Physiotherapy management for Musculoskeletal conditions	1. Demonstrate the clinical reasoning and decision making process for the management of the patient based on the evaluation (C3, P5, A3) 2. Organizes problem list and plan short term and long-term goals based on the evaluation findings (C3, P5, A3) 3. Plan and perform Physiotherapy treatment techniques (C3, P5, A3) 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. Displays ethical and professional behaviour (Autonomy, Beneficence and Justice) during treatment (A4)	190
	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**
Case Presentations	x	x	x	x
Clinical performance	x	x	x	x
Feedback Process	Mid-Semester Feedback			
	End-Semester Feedback			
Main Reference	1. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011. 2. Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams &			

	Wilkins; 2001. 3. Neumann DA. Kinesiology of the Musculoskeletal System-E-Book: Foundations for Rehabilitation. Elsevier Health Sciences; 2013. 4. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences; 2014. 5. Hoppenfeld S, Hutton R, Hugh T. Physical examination of the spine and extremities. New York: Appleton-Century-Crofts; 1976. 6. Aronoff GM, editor. Evaluation and treatment of chronic pain. Lippincott Williams & Wilkins; 1999. 7. Hislop H, Avers D, Brown M. Daniels and Worthingham's Muscle Testing-E-Book: Techniques of Manual Examination and Performance Testing. Elsevier Health Sciences; 2013. 8. Kendall FP, McCreary EK, Provance PG, Rodgers MM, Romani WA. Muscles: Testing and Function, with Posture and Pain (Kendall, Muscles). Philadelphia: Lippincott Williams & Wilkins; 2005. 9. Norkin CC, White DJ. Measurement of joint motion: a guide to goniometry. FA Davis; 2016 Nov 18. 10. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. Hall CM, Brody LT. Therapeutic exercise: moving toward function. Lippincott Williams & Wilkins; 2005. 11. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013. 12. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E-Book. Elsevier Health Sciences; 2013. 13. Wittink H, Michel TH, editors. Chronic pain management for physical therapists. Butterworth-Heinemann Medical; 2002. 14. Tippett SR, Voight ML. Functional progressions for sport rehabilitation. Human Kinetics; 1995. 15. Moir G. Strength and Conditioning. Jones & Bartlett Publishers; 2015 Feb 27. 16. Thomas RB, Roger WE. Essentials of strength training and conditioning. National strength and Conditioning Association. 2000:393-427. 17. McMurray RG. Concepts in fitness programming. CRC Press; 1998 Dec 23.
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 (Musculoskeletal sciences)
Course Title	**Research Progress in Musculoskeletal Sciences - I**
Course Code	**PTH6480**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Students should have acquired the basic knowledge in Research methodology
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
Unit 2		
Data collection	1. Perform data collection according to the procedure approved by the approval committees (P5, A3)	26

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

SEMESTER - III

COURSE CODE	:	COURSE TITLE
PTH7401	:	Physiotherapy in General Musculoskeletal Sciences
PTH7403	:	Physiotherapy Clinical Practice in Musculoskeletal Sciences - II
PTH7405	:	Evidence Based Physiotherapy Practice in Musculoskeletal Sciences
PTH7470	:	Research Progress in Musculoskeletal Sciences - II

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal Sciences)
Course Title	**Physiotherapy in General Musculoskeletal Sciences**
Course Code	**PTH7401**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Students should have basic knowledge in applied anatomy, physiology and physiotherapeutic skills
Course Synopsis	This course will offer physiotherapeutic management of surgical and non-surgical musculoskeletal disorders resulting from overuse, trauma and systemic / metabolic bone and joint disorders in the form of lectures, tutorials, discussions, self-directed and problem based learning. Theory examination will be used to assess the students' learning outcomes.

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

CO1	Justifies assessment procedures, evidence based physiotherapy interventions and rehabilitation for musculoskeletal dysfunction using the principles of different schools of Manual therapy (C5)
CO2	Appraises exercise testing and prescription of musculoskeletal fitness in sports population with evidence informed practical skills for sports Injury prevention and rehabilitation. (C5)
CO3	Explains an Evidence-Informed practice for Hand rehabilitation (C5)
CO4	Analyze and interpret the various investigations and imaging techniques used in orthopedics. List the preoperative and postoperative Physiotherapy management of spine and extremities (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			x				
CO4	x				x			

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Physiotherapy management in connective tissue disorder in Musculoskeletal conditions	1. Evaluate and interpret the musculoskeletal conditions (C5) 2. Apply clinical reasoning concepts in musculoskeletal conditions (C3) 3. Judges, justifies, recommends and applies physiotherapy treatment in musculoskeletal conditions(C5) 4. Appraise evaluation findings while planning physiotherapy treatments.(C5)	3
Unit 2		
Post-operative Rehabilitation	1. Outline the common surgical interventions for spine and extremities and their post-operative management (C2) 2. Plan the rehabilitation protocols for post-operative management of spine and extremities (C3) 3. Outline the surgical procedures commonly performed for paediatric musculoskeletal conditions (C2) 4. Plan the post-operative rehabilitation following Paediatric musculoskeletal surgeries (C3) 5. List evidence for rehabilitation following Post-operative rehabilitation of musculoskeletal conditions for promoting optimal mobility and physical activity (C4)	4
Unit 3		
Investigations and Musculoskeletal sciences	1. Choose and interpret the common Investigations performed for Musculoskeletal conditions (C3) • Plain radiograph • Bone Scans • CT/MRI • Electro diagnosis 2. Analyse and interpret the investigations following Hand disorders (C4) 3. Identify the recent advances in imaging techniques used in the diagnosis of Injuries related to sports (C2)	3
Unit 4		
Exercise testing and prescription for	1. Explain the importance of exercise testing in musculoskeletal conditions (C5) 2. Analyses develops and prescribes exercises	3

Content	Competencies	Number of Hours
Musculoskeletal conditions	in musculoskeletal conditions (C4)	
Unit 5		
Manual Therapy	1. Outline the principles of different schools of Manual Therapy (C2) 2. Importance of Manual therapy techniques on spinal and peripheral dysfunction (C5) 3. Summarize the safety measures and precautions for application of Manual therapy approaches (C2) 4. Able to apply principles of different schools of manual therapy in musculoskeletal conditions. (C4)	5
Unit 6		
Hand Rehabilitation	1. Explain the Zones of Hand and list its clinical implications (C2) 2. Explain the pathophysiology, clinical features and outline the conditions affecting Hand (C2) a. Rheumatoid Arthritis b. Spastic Hand c. Complex Regional Pain syndrome d. Tendon Injuries e. Stiff Hand 3. Explain the causes for Complex Regional pain syndrome and the importance of physical therapy interventions (C5) 4. Summarise the investigations related to Hand Conditions (C2) 5. Outline the sensory and motor assessment for common Hand conditions (C2) 6. Explain the rehabilitation stages following Tendon Transfer (C2) 7. List the evidence based physiotherapy interventions for Hand oedema (C4)	4
Unit 7		
Neuro-Musculoskeletal Taping techniques	1. Explain the indications, principles of application, rationale choosing the neuromuscular taping techniques in acute and chronic Musculoskeletal conditions (C5) 2. Evaluates and plans taping techniques in neurological and musculoskeletal conditions (C5) 3. Summarize the and clinical significance of taping techniques (C2)	4

Content	Competencies	Number of Hours
Unit 8		
Drugs in Orthopedics	1. List the effects of common drugs used in orthopaedic conditions (C1) 2. Recall the effects of therapeutic modalities in musculoskeletal conditions (C1) 3. Explain the effect of drugs and its interaction to implementation of therapeutic modalities (C2)	2
Unit 9		
Injury prevention and rehabilitation in sports	1. Explain the role of sports physiotherapist (C2) 2. Explain the different types of sports and classification of sport injuries (C2) 3. List the principles of Injury prevention in sports conditions (C4) 4. Explain the importance of injury prevention strategies commonly used in sports conditions (C5) 5. Explain the guidelines for pre-screening assessment and management for Injury prevention in various sports (C2) 6. List the conservative and surgical interventions following common sport injuries (C4) 7. Analyze and plan the preoperative and postoperative evidence based Physiotherapy assessment and management of sport injuries(C4) 8. Explain the implications on exercise prescription for sports rehabilitation (C2) 9. Importance of physiotherapy approaches in the management of athletes following sports injuries (C5)	8
Unit 10		
Somatic dysfunction	1. Explain the causes, risk factors and theories of somatic dysfunction (C2) 2. Outline the tests and measures to screen and Identify the myofascial structures in somatic dysfunction (C2) 3. Explain the guidelines for the application of treatment techniques in myofascial dysfunction (C2) 4. Evaluate the rehabilitation strategies to maintain the integrity of myofascial structures (C5) 5. Explain the role of physiotherapy in management of mechanical musculoskeletal conditions (C2)	3

Content	Competencies	Number of Hours
	6. Analyze and plan an evidence based physiotherapy management of the acute and 7. chronic somatic dysfunctions (C4)	
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)

Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	12	24
Small group discussion (SGD)	4	8
Problem Based Learning (PBL)	2	4
Case Based Learning (CBL)	4	8
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**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1	x	x	x	x
Presentations	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Hertling D, Kessler RM. Management of common musculoskeletal disorders: physical therapy principles and methods. Lippincott Williams & Wilkins; 2006. 2. Donatelli RA, Wooden MJ. Orthopaedic Physical Therapy: Elsevier health sciences; 2009. 3. Brotzman SB, Manske RC. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach-Expert Consult. Elsevier Health Sciences; 2011. 4. O'Sullivan SB, Schmitz TJ, Fulk G. Physical rehabilitation. FA Davis; 2013. 5. Hoppenfeld S, Murthy VL, editors. Treatment and rehabilitation of fractures. Lippincott Williams & Wilkins; 2000. 6. Braddom RL. Physical Medicine and Rehabilitation. Elsevier Health Sciences; 2010. 7. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences.

	8. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. 9. Brukner P. Brukner & Khan's clinical sports medicine. North Ryde: McGraw-Hill; 2012.
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 (Musculoskeletal sciences)
Course Title	**Physiotherapy Clinical practice in Musculoskeletal Sciences**
Course Code	**PTH7403**
Academic Year	Second
Semester	III
Number of Credits	12
Course Prerequisite	Students should have basic knowledge in applied anatomy, applied physiology and physiotherapeutic skills.
Course Synopsis	This course will offer information and hands on training on applying fundamental and advanced knowledge in therapeutic sciences for principles of assessment and techniques used in physiotherapeutic management of musculoskeletal pain and movement disorders. This course will be delivered in the form of lectures, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised clinical practice with self-directed and problem-solving principles and evidence-based practice in decision making of patient/client management. 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	Apply a skilled and effective subjective and physical examination, using clinical decision making and perform physiotherapy management of a patient with acute and chronic pain for Improving and maintaining optimal functional independence and physical performance (C3,P5,A3)
CO2	Choose and recommend a structured exercise program for musculoskeletal disorders using different schools of Manual therapy (C5, P5, A3)
CO3	List the assessment procedures and evidence based physiotherapy interventions and rehabilitation for sports Injury (C4,P5,A3)
CO4	Analyze and apply evidence based practice in using exercise testing and exercise prescription for musculoskeletal conditions(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		
Physiotherapy evaluation and clinical reasoning in Musculoskeletal conditions	1. Apply the guidelines physiotherapy evaluation and clinical reasoning in musculoskeletal conditions (C3, P4, A3) 2. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 3. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during fitness testing and exercise prescription in adolescent girls and female athlete (A4)	90
Unit 2		
Principles of assessment using different schools of Manual therapy	1. Construct a structured assessment program for musculoskeletal disorders (C3, P4, A3) 2. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 3. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during evaluation and exercise prescription in adolescent girls (A4)	90
Unit 3		
Principles of Assessment in Sports injury prevention and Rehabilitation	1. Demonstrate Injury prevention and on field assessment for sports injury (C3, P4, A3) 2. Analyze the rationale, analysis and performance of various fitness testing protocols and exercise prescription for different sport population (C4, P4, A3) 3. Summarize, demonstrate and justify the assessment procedures (including exercise testing and musculoskeletal assessment), evidence based physiotherapy interventions and rehabilitation of musculoskeletal disorders related to sports (C2, P4, A3) 4. Explain the methods and implementation strategies on using the workplace as a site for promotion of health (C2, P4, A4) 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	90

Content	Competencies	Number of Hours
	evaluation and exercise prescription (A4)	
Unit 4		
Investigations for Musculoskeletal conditions and its Interpretation	1. Identify and interpret the appropriate investigations and its uses in Musculoskeletal disorders (C3, P5) 2. Identify and interpret investigations in normal and Neuromusculoskeletal disorders (C3, P5)	30
Unit 5		
Physiotherapy assessment and management in Hand conditions	1. Perform physiotherapy assessment in clients with Hand disorders (C3, P5, A3) 2. Displays the ability to interpret investigations (C3, P5) 3. Organizes problem list and plan short term and long-term goals based on the evaluation findings (C3, P5, A3) 4. Plan and perform Physiotherapy treatment techniques (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. Displays ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and treatment of clients. (A4)	90
Unit 6		
Somatic dysfunction	1. Identify and plan the evidence based Physiotherapy assessment and management for somatic dysfunction (C5, P5, A3) 2. Demonstrate the use of validated outcome tools (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. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and intervention (A4)	48
Unit 7		
Taping Techniques	1. Evaluate and plan an evidence based physiotherapy assessment management of Neuromuscular taping (C5, P5, A3) 2. Demonstrate Application of Taping methods in musculoskeletal conditions (C3, P5, A3) 3. Demonstrate the use of validated outcome measures (C3, P5, A3)	30

Content	Competencies	Number of Hours
	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. 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	-
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. Hertling D, Kessler RM. Management of common musculoskeletal disorders: physical therapy principles and methods. Lippincott Williams & Wilkins; 2006. 2. Donatelli RA, Wooden MJ. Orthopaedic Physical Therapy: Elsevier health sciences; 2009. 3. Brotzman SB, Manske RC. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach-Expert Consult. Elsevier Health Sciences; 2011. 4. O'Sullivan SB, Schmitz TJ, Fulk G. Physical rehabilitation. FA Davis; 2013. 5. Hoppenfeld S, Murthy VL, editors. Treatment and rehabilitation of fractures. Lippincott Williams & Wilkins; 2000. 6. Braddom RL. Physical Medicine and Rehabilitation. Elsevier Health Sciences; 2010. 7. Magee DJ. Orthopedic physical assessment. Elsevier Health Sciences; 201.

	8. Hoppenfeld S, Hutton R, Hugh T. Physical examination of the spine and extremities. New York: Appleton-Century-Crofts; 1976 May. 9. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. 10. Brukner P. Brukner & Khan's clinical sports medicine. North Ryde: McGraw-Hill;2012.
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 (Musculoskeletal sciences)
Course Title	**Evidence based physiotherapy practice in Musculoskeletal sciences**
Course Code	**PTH7405**
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 musculoskeletal conditions disorders. Through this course, students will learn to summarise recent trends and developments in musculoskeletal conditions (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 musculoskeletal condition diseases across life span (C5)
CO3	Appraise the process of evidence-based practice in lifestyle 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 Musculoskeletal sciences	1. Identify, appraise and summarize evidence through systematic searches of databases for the assessment of Musculoskeletal Sciences (C5) 2. Recommend strategies for implementation of evidence based practice assessment of musculoskeletal skeletal conditions(C5)	**12**
Unit 3		
Evidence based Physiotherapy management of Musculoskeletal sciences	1. Identify, appraise and summarize evidence through systematic searches of databases for the management of musculoskeletal disorders (C5) 2. Recommend strategies for implementation of evidence based practice management strategies for musculoskeletal disorders (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 (Musculoskeletal sciences)
Course Title	**Research Progress in Musculoskeletal Sciences - II**
Course Code	**PTH7470**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Students should have knowledge in application of the 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 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**	**PO 8**
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

Option 1: Elective in Musculoskeletal Sciences - Manual Therapy

COURSE CODE	:	COURSE TITLE
PTH7412	:	Manual Therapy
PTH7414	:	Clinical Practice in Manual Therapy
PTH7480	:	Research Project in Musculoskeletal Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal Sciences)
Course Title	**Manual Therapy**
Course Code	**PTH7412**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	This course will provide information and hands on training on assessment, clinical reasoning, hypothesis generation and management of pain and movement disorders in Neuromusculoskeletal system through manual approaches. It uses contemporary methods to facilitate the students to apply basic and applied sciences in Manual therapy.

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

CO1	Apply clinical decision making process and make use of information from orthopedic clinical examination to recommend Manual therapy interventions based on the principles of ethical decision making for common musculoskeletal disorders. (C5)
CO2	Apply known Patho-anatomical, biomechanical, cognitive and Psychosocial basis to the clinical presentation and amalgamate Hypothesis oriented approach for management of patients with musculoskeletal disorders. (C3)
CO3	Prove proficiency with manual therapy techniques and exercise-based interventions established to be effective based on the evidence informed practice. (C5)
CO4	Choose and Interpret outcome measure and assessment tools commonly used to analyze the impact of disease on movement, function and disability pertinent to the orthopedic Manual therapy (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		
CO4	x			x				

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Clinical reasoning	1. Utilize clinical reasoning dimensions and models to integrate and implement experiential reflective practice in clinical decision making (C3)	2
Unit 2		
Pain Sciences	1. Identify risk factors for chronic pain and support the biopsychosocial approaches for chronic pain management (C5) 2. Explain basic molecular biology, stress biology , pain neurobiology and its integration into clinical reasoning (C5) 3. Make use of pain modulation theory and outline peripheral and central pain mechanism (C3) 4. Identify pain measurement tools and management strategies via Physiotherapy.(C3)	5
Unit 3		
McKenzie's School of thought	1. Explain the Importance of McKenzie classification for spinal pain (C5) 2. Outline the Quebec task force classification for spinal disorders (C2)	3
Unit 4		
Neurodynamics and Neural Tissue mobilization	1. Outline basics of anatomy, physiology, biomechanics of neural tissue (C2) 2. Summarize the principles, Indications and contra indications of neurodynamic dysfunction performed in extremities and spine (C2)	3
Unit 5		
Kaltenborn Techniqe	1. List and summarize the principles of Kaltenborn technique for spinal and peripheral dysfunction (C4)	1
Unit 6		
Cyriax Technique	1. Apply the use of selective tissue tension test in physiotherapy assessment. (C3) 2. Summarize the common management strategies in spinal and peripheral joint and soft tissue dysfunction using Cyriax principle .(C2) 3. Explain the importance of Cyriax techniques (Deep transverse friction massage,	3

Content	Competencies	Number of Hours
	manipulation and injection) for peripheral and spinal soft tissue dysfunction (C5)	
Unit 7		
Maitland's School of thought	1. List the principles of subjective examination, physical examination, treatment, re-assessment (continued analytical assessment) of spinal and peripheral joint problems.(C4) 2. Interpret Movement diagram and its application. (C5) 3. Outline the application of Australian protocol approach in the manipulative VBI testing. 4. Choose the management of various peripheral and vertebral neuromusculoskeletal conditions based on the clinical presentation with special emphasis on High velocity Thrust techniques (C5).	6
Unit 8		
Mulligan School of thought	1. List the principles and importance of Mulligan's Concept and apply of ethical decision making in the physiotherapy management. (C4) 2. Explain the principles of application, rationale choosing the various techniques of Mulligan concept in spinal and peripheral dysfunction (C5)	3
Unit 9		
Neuromuscular soft tissue techniques • **Positional Release Technique** • **Myofascial Release technique** • **Muscle Energy Technique**	1. Outline the assessment and management using positional release techniques. (C2) 2. Select strain- counter strain and functional technique for musculoskeletal disorders. (C5)	6
Unit 10		
Combined Movement	1. Explain the regular and irregular patterns in cervical, thoracic and lumbar regions. (C5) 2. Plan an evidence based physiotherapy assessment and management for spinal dysfunction using combined movement. (C5)	3

Content	Competencies	Number of Hours
Unit 11		
Motor control in Spinal and Peripheral pain	1. Recall the theories of motor control and motor learning (C1) 2. Summarize movement development. (C2) 3. Evaluate the causes and mechanism of abnormal movement following injury and the influence of functional stability training on functional recovery. (C5) 4. Analyze and plan an evidence based physiotherapy management using motor control and motor learning theory (C4)	4
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	12	24
Small group discussion (SGD)	4	8
Problem Based Learning (PBL)	2	4
Case Based Learning (CBL)	4	8
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**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1	x	x	x	x
Presentations	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Hengeveld E, Banks K, editors. Maitland's Peripheral Manipulation: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences;2013 2. Hengeveld E, Banks K, editors. Maitland's Vertebral Manipulation E-Book: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences; 2013. 3. Twomey LT. Grieve's modern manual therapy.

4. Gibbons P, Tehan P. Manipulation of the Spine, Thorax and Pelvis: An Osteopathic Perspective. Elsevier Health Sciences; 2009.
5. Jones MA, Rivett DA. Clinical Reasoning for Manual Therapists. Elsevier Health Sciences; 2003.
6. Butler DS, Jones MA. Mobilisation of the nervous system. Elsevier Health Sciences; 1991.
7. Shacklock M. Clinical neurodynamics: a new system of musculoskeletal treatment. Elsevier Health Sciences; 2005.
8. DeStefano LA. Greenman's principles of manual medicine. Lippincott Williams & Wilkins; 2011.
9. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E Book. Elsevier Health Sciences; 2013.
10. Chaitow L. Modern Neuromuscular Techniques. Elsevier Health Sciences; 2010.
11. Chaitow L. Positional release techniques. Elsevier Health Sciences; 2002
12. Chaitow L, Crenshaw K. Muscle energy techniques. Elsevier Health Sciences; 2006.
13. McKenzie, Robin, and Stephen May. The lumbar spine: mechanical diagnosis and therapy. Vol. 1 & 2 Orthopedic Physical Therapy; 1990
14. McKenzie R. The cervical and thoracic spine: mechanical diagnosis and therapy. Orthopedic Physical Therapy; 1990.
15. Hing W, Hall T, Rivett DA, Vicenzino B, Mulligan B. The Mulligan Concept of Manual Therapy: Textbook of Techniques. Elsevier Health Sciences; 2015.
16. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 2: The Spine.
17. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 1: The Extremities.
18. Richardson C, Jull G, Hodges P, Hides J. Therapeutic exercise for spinal segmental stabilization in low back pain. London: Churchill Livingstone. 1999.
19. Sahrmann S. Diagnosis and treatment of movement impairment syndromes. Elsevier Health Sciences; 2002.
20. Comerford M, Mottram S. Kinetic Control: The Management of Uncontrolled Movement. Elsevier Health Sciences; 2012.

	21. Bryden L. Manual of Combined Movements—Their use in the examination and treatment of mechanical vertebral column disorders. 22. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013. 23. Liebenson C, editor. Rehabilitation of the spine: a practitioner's manual. Lippincott Williams & Wilkins; 2007. 24. Pfund R, Zahnd F. Differentiation, Examination and Treatment of Movement Disorders in Manual Therapy. Butterworth-Heinemann; 2006.
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 (Musculoskeletal Sciences)
Course Title	**Clinical Practice in Manual Therapy**
Course Code	**PTH7414**
Academic Year	Second
Semester	IV
Number of Credits	12
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	This course will offer information and hands on training on applying fundamental and advanced knowledge in therapeutic sciences for principles of assessment and techniques used in physiotherapeutic management of musculoskeletal pain and movement disorders. This course will be delivered in the form of lectures, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised clinical practice with self-directed and problem-solving principles and evidence-based practice in decision making of patient/client management. 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	Choose and recommend assessment using Manual therapy approaches relating patho-anatomical neurophysiological, biomechanical, cognitive and psychological basis to the clinical presentation of spinal and peripheral disorders(C5, P5, A3)
CO2	Apply a skilled and effective subjective and physical examination, using clinical decision making and perform physiotherapy management of a patient with spinal and peripheral dysfunction (C3,P5,A3)
CO3	Plan an appropriate and effective subjective and physical examination of a patient with neuromusculoskeletal disorders using effective clinical analysis and clinical decision making. (C4, P5, A3)
CO4	List the application of orthopedic manipulative therapy techniques and evidence based physiotherapy interventions and rehabilitation for neuromusculoskeletal disorders. (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		
Physiotherapy evaluation and clinical reasoning in Neuromusculoskeletal disorders using various manual therapy schools of thoughts	1. Apply the guidelines for physiotherapy evaluation and clinical reasoning in Neuromusculoskeletal disorders(C3, P4, A3) 2. Discuss hypothesis categories in Manual therapy (C3, P5, A3) 3. Construct a structured assessment program for spinal and peripheral dysfunction using McKenzie's concept. (C3, P4, A3) 4. Demonstrate assessment for adverse neural tension disorders. (C3, P4, A3) 5. Analyze the rationale of various outcome measures following Adverse neural tension disorders (C4, P4, A3) 6. Summarize, demonstrate assessment procedures using neural tissue mobilization (C2, P4, A3) 7. Identify and interpret the appropriate manual therapy assessment and its uses in Peripheral and spinal dysfunction (C3, P5) 8. Explain the evidence informed assessment and management following peripheral and vertebral neuromusculoskeletal dysfunction using Cyriax approach. (C3,P5) 9. Explain the evidence informed assessment and management following peripheral and vertebral neuromusculoskeletal dysfunction using Maitland approach(C3,P5) 10. Explain the evidence informed assessment and management following vertebral neuromusculoskeletal dysfunction using combined movement (C3, P5) 11. Plan and perform Physiotherapy soft tissue mobilization techniques in neuromusculoskeletal disorders (C3, P5, A3) 12. Evaluate and plan an evidence based physiotherapy assessment and management of soft tissue disorders using different approaches	234

Content	Competencies	Number of Hours
	(C5, P5, A3) 13. Identify and plan the evidence based Physiotherapy assessment and management for spinal and peripheral pain. (C5, P5, A3) 14. Perform physiotherapy assessment in clients with spinal and peripheral joint dysfunction using Mulligan's concept (C3, P5, A3) 15. Demonstrate the use of validated outcome tools and pain management strategies. (C3, P5, A3) 16. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during Manual therapy assessment (A4) 17. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3)	
Unit 2		
Physiotherapy management and clinical reasoning in Neuromusculoskeletal disorders using various manual therapy schools of thoughts	1. Summarize, demonstrate and justify the evidence based physiotherapy interventions and rehabilitation using various manual therapy schools of thought (C3,P5,A3) 2. Organizes problem list and plan short term and long-term goals based on the evaluation findings following Mulligan's technique. C3, P5, A3) 3. Demonstrate Application of Positional release technique for spinal and peripheral dysfunction. (C3, P5, A3) 4. Demonstrate the use of Neuromuscular techniques following neuromusculoskeletal disorders.(C3, P5, A3) 5. Apply Myofascial release technique for trigger points.(C5, P5,A3) 6. Recommend the use of Muscle energy technique for neuromusculoskeletal disorders.(C3, P5, A3) 7. Explain the evidence informed management following neuromusculoskeletal dysfunction using Motor control approach (C5,P5,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	-
Revision	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. Hengeveld E, Banks K, editors. Maitland's Peripheral Manipulation: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences;2013 2. Hengeveld E, Banks K, editors. Maitland's Vertebral Manipulation E-Book: 3. Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences; 2013. 4. Twomey LT. Grieve's modern manual therapy. 5. Gibbons P, Tehan P. Manipulation of the Spine, Thorax and Pelvis: An Osteopathic Perspective. Elsevier Health Sciences; 2009. 6. Jones MA, Rivett DA. Clinical Reasoning for Manual Therapists. Elsevier Health Sciences; 2003. 7. Butler DS, Jones MA. Mobilisation of the nervous system. Elsevier Health Sciences; 1991. 8. Shacklock M. Clinical neurodynamics: a new system of musculoskeletal treatment. Elsevier Health Sciences; 2005. 9. DeStefano LA. Greenman's principles of manual medicine. Lippincott Williams & Wilkins; 2011. 10. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E Book. Elsevier Health Sciences; 2013. 11. Chaitow L. Modern Neuromuscular Techniques. Elsevier Health Sciences; 2010. 12. Chaitow L. Positional release techniques. Elsevier

	Health Sciences; 2002 13. Chaitow L, Crenshaw K. Muscle energy techniques. Elsevier Health Sciences; 2006. 14. McKenzie, Robin, and Stephen May. The lumbar spine: mechanical diagnosis and therapy. Vol. 1 & 2 Orthopedic Physical Therapy; 1990 15. McKenzie R. The cervical and thoracic spine: mechanical diagnosis and therapy. Orthopedic Physical Therapy; 1990. 16. Hing W, Hall T, Rivett DA, Vicenzino B, Mulligan B. The Mulligan Concept of Manual Therapy: Textbook of Techniques. Elsevier Health Sciences; 2015. 17. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 2: The Spine. 18. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 1: The Extremities. 19. Richardson C, Jull G, Hodges P, Hides J. Therapeutic exercise for spinal segmental stabilization in low back pain. London: Churchill Livingstone. 1999. 20. Sahrmann S. Diagnosis and treatment of movement impairment syndromes. Elsevier Health Sciences; 2002. 21. Comerford M, Mottram S. Kinetic Control: The Management of Uncontrolled Movement. Elsevier Health Sciences; 2012. 22. Bryden L. Manual of Combined Movements. Their use in the examination and treatment of mechanical vertebral column disorders. 23. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013. 24. Liebenson C, editor. Rehabilitation of the spine: a practitioner's manual. Lippincott Williams & Wilkins; 2007. 25. Pfund R, Zahnd F. Differentiation, Examination and Treatment of Movement Disorders in Manual Therapy. Butterworth-Heinemann; 2006.
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 (Musculoskeletal Sciences)
Course Title	**Research Project in Musculoskeletal Sciences**
Course Code	**PTH7480**
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 Musculoskeletal Sciences- Sports Physiotherapy

COURSE CODE	:	COURSE TITLE
PTH7422	:	Sports Physiotherapy
PTH7424	:	Clinical Practice in Sports Physiotherapy
PTH7480	:	Research Project in Musculoskeletal Sciences

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal Sciences)
Course Title	**Sports Physiotherapy**
Course Code	**PTH7422**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	This course will provide information and hands on training for principles of assessment for prevention and physiotherapeutic management of sport and activity related injuries in Neuromusculoskeletal system. It uses contemporary methods to facilitate the students to apply basic and applied sciences in physiotherapy for sport. This course will be delivered in the form of lectures, tutorials, demonstration during, clinical teaching through discussions and self-directed and problem based 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	Apply fundamental and advanced knowledge in therapeutic movement and exercise sciences. (C5)
CO2	Demonstrate comprehensive assessment techniques and formulate specific treatment plan based. (C2)
CO3	Prove proficiency with monitoring sports specific exercise-based interventions established to be effective based on the evidence informed practice and to re-evaluate treatment plans. (C5)
CO4	Choose and Identify the scope and limitations of professional practices, manage and refer appropriately.(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	
CO4			x		x			

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Sports Rehabilitation	1. Utilize the classification of sports injuries and apply the sports rehabilitation in various types of sports (C3)	2
Unit 2		
Biomechanics of sporting activities	2. Summarize the biomechanics of different activities of sport and their injury mechanics (C2)	2
Unit 3		
Applied exercise physiology in sports rehabilitation	1. Explain the Importance of basic energy system and metabolism and their adaptations to aerobic and anaerobic training (C3) 2. Outline the significance of thermoregulation and exercise in hypo, hyperbaric and microgravity (C2) 3. Identify risk factors for fatigue and overtraining (C2,C5)	3
Unit 4		
Injury Prevention	1. Outline needs for Injury prevention evaluation (C2) 2. Importance of outcome measures in sports physiotherapy (C5) 3. Summarize the principles of Injury prevention (C2) 4. Apply knowledge on application of taping, bracing, electrotherapy modalities and equipment's used for Injury prevention.(C5) 5. Explain different types of training used for injury prevention strategies.(C5)	5
Unit 5		
Sports Psychology	1. List and summarize the role of sports psychologist in linking psychological factors involved in performance (C4) 2. Make use of biopsychosocial interventions for the predicting models of injury, treatment of sports injury and pain (C3)	2
Unit 6		
Sports Nutrition, Sports pharmacology and ergogenic aids	1. Explain the importance of carbohydrate, Proteins, fats, water intake and vitamins on athlete's need. (C5) 2. Identify the energy requirement and sports specific nutrition based on the type of sport. (C3)	3

Content	Competencies	Number of Hours
	3. List the permitted and ban drugs by International Olympic Committee and add a note on drug testing and ergogenic aids(C4)	
Unit 7		
Sports Injuries of Upper limb, Head, Neck , spine and Lower limb	1. Outline the common sports injures of upper limb, Head, Neck, Spine and Lower Limb,(C5) 2. Choose the management of common sports injuries based on the clinical presentation with special emphasis on specific rehabilitation protocols. (C5).	4
Unit 8		
Specific Sports Population	1. List the common problems in paediatric population in sports and explain the training guidelines. (C5) 2. Outline the common problems in geriatric population and discuss the training guidelines (C2) 3. Recommend general exercise prescription and training principles to maintain fitness. (C5) 4. Outline the common sports for special population and apply appropriate assessment and management for preventing injuries and rehabilitation. (C2) 5. Importance of sports in paraplegics, mental retardation and wheel chair athletes. (C5)	5
Unit 9		
Sports in Chronic illness	1. Construct evidence informed assessment and management for sports in various chronic illness. (C3)	2
Unit 10		
Women and Sports	1. Explain the gender differences in sports population and the common injuries in women. (C5) 2. Plan an exercise prescription for women athlete and effect of exercise on menstrual cycle and performance. (C5)	2
Unit 11		
Sports and Health Promotion	1. Outline the role of sports physiotherapist in promotion of healthy lifestyle in the community. (C2)	2
Unit 12		
Emergency care in sports	1. Explain the emergency care and athletic first aid for shock management, internal and external bleeding. (C2)	2

Content	Competencies	Number of Hours
	2. Evaluate the role of sports physiotherapist in heat stroke and heat illness (C5)	
Unit 13		
Advances in sports rehabilitation	1. Plan an evidence based physiotherapy management for sports injury management (C4) 2. List the recent advances in exercise prescription for sports injury management. (C4)	3
Unit 14		
Medico-Legal Issues	1. Outline the legal rights of disabled athletes.(C2) 2. Summarize the assumption of risk, contributing and comparative negligence, liability and litigation	2
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT)		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	12	24
Small group discussion (SGD)	4	8
Problem Based Learning (PBL)	2	4
Case Based Learning (CBL)	4	8
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**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1	x	x	x	x
Presentations	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Hengeveld E, Banks K, editors. Maitland's Peripheral Manipulation: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences;2013

2. Hengeveld E, Banks K, editors. Maitland's Vertebral Manipulation E-Book: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences; 2013.
3. Twomey LT. Grieve's modern manual therapy.
4. Gibbons P, Tehan P. Manipulation of the Spine, Thorax and Pelvis: An Osteopathic Perspective. Elsevier Health Sciences; 2009.
5. Jones MA, Rivett DA. Clinical Reasoning for Manual Therapists. Elsevier Health Sciences; 2003.
6. Butler DS, Jones MA. Mobilisation of the nervous system. Elsevier Health Sciences; 1991.
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8. DeStefano LA. Greenman's principles of manual medicine. Lippincott Williams & Wilkins; 2011.
9. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E Book. Elsevier Health Sciences; 2013.
10. Chaitow L. Modern Neuromuscular Techniques. Elsevier Health Sciences; 2010.
11. Chaitow L. Positional release techniques. Elsevier Health Sciences; 2002
12. Chaitow L, Crenshaw K. Muscle energy techniques. Elsevier Health Sciences; 2006.
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15. Hing W, Hall T, Rivett DA, Vicenzino B, Mulligan B. The Mulligan Concept of Manual Therapy: Textbook of Techniques. Elsevier Health Sciences; 2015.
16. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 2: The Spine.
17. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 1: The Extremities.
18. Richardson C, Jull G, Hodges P, Hides J. Therapeutic exercise for spinal segmental stabilization in low back pain. London: Churchill Livingstone. 1999.
19. Sahrmann S. Diagnosis and treatment of movement

	impairment syndromes. Elsevier Health Sciences; 2002. 20. Comerford M, Mottram S. Kinetic Control: The Management of Uncontrolled Movement. Elsevier Health Sciences; 2012. 21. Bryden L. Manual of Combined Movements—Their use in the examination and treatment of mechanical vertebral column disorders. 22. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013. 23. Liebenson C, editor. Rehabilitation of the spine: a practitioner's manual. Lippincott Williams & Wilkins; 2007. 24. Pfund R, Zahnd F. Differentiation, Examination and Treatment of Movement Disorders in Manual Therapy. Butterworth-Heinemann; 2006. 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 (Musculoskeletal Sciences)
Course Title	**Clinical Practice in Sports Physiotherapy**
Course Code	**PTH7424**
Academic Year	Second
Semester	IV
Number of Credits	12
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	This course will provide information and hands on training for principles of assessment for prevention and physiotherapeutic management of sport and activity related injuries in Neuromusculoskeletal system. It uses contemporary methods to facilitate the students toapply basic and applied sciences in physiotherapy for sport This course will be delivered in the form of lectures, tutorials, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised clinical practice and self-directed and problem based learning. Theory and practical examination will be used to assess the students' transferable skills and the learning outcomes 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	Choose and recommend assessment using biomechanics and Pathomechanics of human movement in sport with appropriate evaluations and implement appropriate treatment strategies in plan of care for common neuromuscular conditions utilizing various techniques (C5, P5, A3)
CO2	Apply a skilled and effective subjective and physical examination, using clinical decision making and perform physiotherapy management of a sports related injuries (C3,P5,A3)
CO3	Plan an appropriate and effective subjective and physical examination for preventing sports specific Injuries and its recovery using effective clinical analysis and clinical decision making. (C4, P5, A3)
CO4	List the application of physical fitness appraisal to plan and promote physical activity with sound knowledge base of exercise physiology (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		
Physiotherapy evaluation in Sports specific Injury.	1. Apply the guidelines for evaluation on sports specific Injuries (C3, P4, A3) 2. Discuss Biomechanical evaluation of different sports activities and their Injury mechanism.(C3, P5, A3) 3. Construct a structured assessment program for Injury Prevention of various sports activities with sports specific outcome measures. (C3, P4, A3) 4. Demonstrate assessment for psychological factors involved in sports performance.(C3, P4, A3) 5. Analyze the rationale of various outcome measures following neuromusculoskeletal disorders following sports specific injuries. (C4, P4, A3) 6. Summarize, demonstrate assessment procedures used following common sports injuries in head, spine and extremities(C2, P4, A3) 7. Identify and interpret the appropriate sports specific assessment and its implication for paediatric, geriatric and special population. (C3, P5) 8. Explain the evidence informed assessment for chronic Illness sports population. (C3,P5) 9. Explain the evidence informed assessment following common Injuries to women (C3,P5) 10. Plan and perform assessment in emergency care in sports physiotherapy (C3, P5, A3) 11. Evaluate and plan an evidence based physiotherapy assessment of soft tissue disorders in various sport (C5, P5, A3) 12. Identify the application of medico-Legal issues in athlete (C5, P5, A3) 13. Demonstrate the use of validated outcome	234

Content	Competencies	Number of Hours
	tools for sports specific injuries. (C3, P5, A3) 14. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during Manual therapy assessment (A4) 15. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3)	
Unit 2		
Physiotherapy management in sports specific Injuries	1. Summarize, demonstrate and justify the evidence based physiotherapy interventions and rehabilitation for different type of sports (C3,P5,A3) 2. Organizes problem list and plan short term and long-term goals based on the phases of sports rehabilitation. C3, P5, A3) 3. Demonstrate the application of Biomechanics of sports specific activities for management of Injury prevention strategies. (C3, P5, A3) 4. Recommend the use of applied exercise physiology in sports rehabilitation.(C3, P5, A3) 5. Demonstrate the use of taping techniques, electrotherapy modalities following sports injuries.(C3, P5, A3) 6. Apply and Identify the role of sports psychologist for sports injury rehabilitation.(C5, P5,A3) 7. Recommend the use of sports specific nutrition(C3,P5,A3) 8. Explain the evidence informed management following sports specific injuries to the Head, spine and extremities. (C5,P5,A3) 9. Summarize the healthy life style promotion in the community. (C2, P4, A3) 10. Recommend the recent advances in exercise prescription and sports injury management.(C3, P5, A3) 11. Explain the role of sports physiotherapist in Emergency care. (C5,P5,A3) 12. Apply and identify the principles of sports rehabilitation for paediatric, geriatric, women, chronic illness and special sports population (C5, P5,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	-
Revision	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. Hengeveld E, Banks K, editors. Maitland's Peripheral Manipulation: Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences;2013 2. Hengeveld E, Banks K, editors. Maitland's Vertebral Manipulation E-Book: 3. Management of Neuromusculoskeletal Disorders. Elsevier Health Sciences; 2013. 4. Twomey LT. Grieve's modern manual therapy. 5. Gibbons P, Tehan P. Manipulation of the Spine, Thorax and Pelvis: An Osteopathic Perspective. Elsevier Health Sciences; 2009. 6. Jones MA, Rivett DA. Clinical Reasoning for Manual Therapists. Elsevier Health Sciences; 2003. 7. Butler DS, Jones MA. Mobilisation of the nervous system. Elsevier Health Sciences; 1991. 8. Shacklock M. Clinical neurodynamics: a new system of musculoskeletal treatment. Elsevier Health Sciences; 2005. 9. DeStefano LA. Greenman's principles of manual medicine. Lippincott Williams & Wilkins; 2011. 10. McMahon SB, Koltzenburg M, Tracey I, Turk D. Wall & Melzack's Textbook of Pain E Book. Elsevier Health Sciences; 2013. 11. Chaitow L. Modern Neuromuscular Techniques. Elsevier Health Sciences; 2010. 12. Chaitow L. Positional release techniques. Elsevier

Health Sciences; 2002
13. Chaitow L, Crenshaw K. Muscle energy techniques. Elsevier Health Sciences; 2006.
14. McKenzie, Robin, and Stephen May. The lumbar spine: mechanical diagnosis and therapy. Vol. 1 & 2 Orthopedic Physical Therapy; 1990
15. McKenzie R. The cervical and thoracic spine: mechanical diagnosis and therapy. Orthopedic Physical Therapy; 1990.
16. Hing W, Hall T, Rivett DA, Vicenzino B, Mulligan B. The Mulligan Concept of Manual Therapy: Textbook of Techniques. Elsevier Health Sciences; 2015.
17. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 2: The Spine.
18. Kaltenborn MF, Evjenth O, Kaltenborn JB. Manual Mobilization of the Joints: Vol 1: The Extremities.
19. Richardson C, Jull G, Hodges P, Hides J. Therapeutic exercise for spinal segmental stabilization in low back pain. London: Churchill Livingstone. 1999.
20. Sahrmann S. Diagnosis and treatment of movement impairment syndromes. Elsevier Health Sciences; 2002.
21. Comerford M, Mottram S. Kinetic Control: The Management of Uncontrolled Movement. Elsevier Health Sciences; 2012.
22. Bryden L. Manual of Combined Movements—Their use in the examination and treatment of mechanical vertebral column disorders.
23. Butler DS, Moseley GL. Explain Pain 2nd Edn. Noigroup Publications; 2013.
24. Liebenson C, editor. Rehabilitation of the spine: a practitioner's manual. Lippincott Williams & Wilkins; 2007.
25. Pfund R, Zahnd F. Differentiation, Examination and Treatment of Movement Disorders in Manual Therapy. Butterworth-Heinemann; 2006.

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 (Musculoskeletal sciences)
Course Title	**Research Project in Musculoskeletal Sciences**
Course Code	**PTH7480**
Academic Year	Second
Semester	IV
Number of Credits	05
Course Prerequisite	Students should have advance knowledge in the 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	2. 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 3: Elective in Musculoskeletal Sciences- Hand Rehabilitation

COURSE CODE	**:**	**COURSE TITLE**
PTH7432	**:**	**Hand Rehabilitation**
PTH7434	**:**	**Clinical Practice in Hand Therapy**
PTH7480	**:**	**Research Project in Musculoskeletal Sciences**

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Master of Physiotherapy (Musculoskeletal Sciences)
Course Title	**Hand Rehabilitation**
Course Code	**PTH7432**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	This course will offer hands on training for principles of assessment and management of upper extremity / upper quarter neuromusculoskeletal disorders. It uses contemporary methods to facilitate the students to apply basic and applied sciences in hand therapy. This course will be delivered in the form of lectures, tutorials, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised Clinical practice and self-directed and problem based learning. Theory and 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	Explain the clinical reasoning concepts and techniques for the upper extremity and Hand (C5)
CO2	Examine the assessment procedures, evidence based physiotherapy interventions and rehabilitation for upper extremity and hand musculoskeletal disorders (C4)
CO3	Importance of Evidence-Informed practice for Hand rehabilitation (C5)
CO4	Choose the assessment tools, outcome measures and concept of therapies for Hand rehabilitation with its recent developments. (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				
CO4				x	x			

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Clinical reasoning in Hand Rehabilitation	1. Apply the clinical reasoning concepts in Hand therapy concepts and techniques (C3)	1
Unit 2		
Physical therapy evaluation of upper extremity and Hand	1. Plan the upper quarter screening and identify sensibility testing for the upper quarter dysfunction (C3) 2. Outline the functional assessment commonly used for Upper extremity dysfunctions (C2) 3. Choose and interpret the Investigations performed for upper quarter (C3) 4. Influence of impairment evaluation on evaluation following upper extremity and Hand (C5)	3
Unit 3		
Physiotherapy in skin and soft tissue conditions of Hand	1. Plan the post-operative rehabilitation following soft tissue conditions of the upper extremity (C3) 2. Explain thermal Injuries of the upper extremity and determine the management principles 3. Categorize soft tissue tumours of the upper extremity and recommend the physiotherapy management strategies (C5) 4. Identify the recent advances used in the evaluation and management of Scar following Injuries related to upper extremity (C2)	3
Unit 4		
Tendon Injuries and Tendinopathies around wrist and Hand	1. Outline stages of Healing for Flexor and Extensor tendon (C2) 2. Importance of physiotherapy management following Tendon Injuries and tendinopathies. (C5) 3. Summarize the Indications and Principles of various surgical procedures performed in wrist and Hand (C2)	3
Unit 5		
Peripheral Nerve Injuries Peripheral Nerve Injury	1. Apply the common assessment and management strategies following peripheral nerve injury of the upper quarter. (C3) 2. List and summarize the common conditions	4

Content	Competencies	Number of Hours
Orthoses	of the Cervico-brachial region (C4) 3. Explain the importance of common entrapment neuropathies of the upper extremities (C5) 4. Apply the explain the recent advances following nerve related injuries of the upper extremity.(C3) 5. Explain the principles and foundations for orthotic management in upper extremity with special emphasis on Functional cast bracing.(C2)	
Unit 6		
Common Injuries of the Upper extremity	1. List the common injuries (fractures, dislocation and instability) in shoulder. Elbow, Wrist and Hand.(C4) 2. Summarize the common tendinopathies of the shoulder and elbow and evidence informed practice following the tendinopathies.(C2) 3. Recommend the assessment and evidence based physiotherapy interventions for Hand oedema following vascular and lymphatic disorders of the upper limb (C4) 4. Identify the predisposing factors, type's effects of scapular dysfunction and outline its assessment and management.	5
Unit 7		
Stiffness of Hand and upper extremity	1. Outline the pathophysiology and management for stiffness of Hand. 2. List the stages of Adhesive capsulitis and summarize the recent advances for the management of Adhesive capsulitis.	2
Unit 8		
Complex Traumatic conditions of the Hand	1. List the importance of complex traumatic conditions of the Hand and apply principles of ethical decision making in the physiotherapy management. 2. Explain the indications , principles of application, rationale choosing the prosthesis in complex traumatic Hand conditions (C5)	2
Unit 9		
Auto Immune disorders of the upper extremity	1. List the Auto Immune disorders of the Hand (C4) 2. Outline the Pathomechanics and identify the appropriate assessment and management	2

Content	Competencies	Number of Hours
	tools for the hand arthritis and its related auto immune disorders. 3. Summarize the Joint replacement surgeries for the upper extremity and its rehabilitation protocols.	
Unit 10		
Complex Regional Pain Syndrome	1. Construct evidence informed assessment and management for chronic regional pain syndrome (C3)	2
Unit 11		
Special Techniques	1.Importance of special techniques in hand rehabilitation following hand disorders (C5)	3
Unit 12		
Hand rehabilitation in special population	1.Explain the guidelines for the Hand Rehabilitation in special population (C2)	2
Unit 13		
Work Related Musculoskeletal disorders	1.Outline the pathophysiology of work related musculoskeletal disorders of the upper limb (C2) 2.Evaluate the rehabilitation strategies to prevent and manage work related musculoskeletal disorders of the upper quarter (C5) 3.Explain the role of physiotherapy in evaluation of functional capacity (C2) 4.Analyze and plan a work oriented program for office workers (C4)	2
Advances in Hand Rehabilitation	1. Evaluate the assessment tools outcome measures and concepts of therapies in upper extremity dysfunction. (C5) 2. Analyze and plan an evidence based physiotherapy management with recent developments in upper extremity and Hand rehabilitation (C4)	5
	Total	**39**

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	12	24
Small group discussion (SGD)	4	8
Problem Based Learning (PBL)	2	4
Case Based Learning (CBL)	4	8
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**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1	x	x	x	x
Presentations	x	x	x	x
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main Reference	1. Skirven TM, Osterman AL, Fedorczyk J, Amadio PC. Rehabilitation of the Hand and Upper Extremity, Elsevier Health Sciences; 2011. 2. Saunders R, Astifidis R, Burke SL, Higgins J, McClinton MA. Hand and Upper Extremity Rehabilitation: A Practical Guide. Elsevier Health Sciences; 2015. 3. Wilton J. Hand Splinting/Orthotic Intervention: Principles of design and fabrication. Vivid Publishing; 2014. 4. Weinzweig, N., Weinzweig, J., & Gu, Y. The mutilated hand. 2005 5. Wolfe SW, Pederson WC, Hotchkiss RN, Kozin SH, Cohen MS. Green's operative hand surgery. Elsevier Health Sciences; 2010. 6. Boscheinen-Morrin J, Conolly WB, Davey V. The hand: fundamentals of therapy. London: Butterworths 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 (Musculoskeletal Sciences)
Course Title	**Clinical Practice In Hand Rehabilitation**
Course Code	**PTH7434**
Academic Year	Second
Semester	IV
Number of Credits	12
Course Prerequisite	Students should have advanced knowledge in application of musculoskeletal therapeutic skills
Course Synopsis	• This course will offer information and hands on training on applying fundamental and advanced knowledge in therapeutic sciences for principles of assessment and techniques used in physiotherapeutic management of musculoskeletal pain and movement disorders. • This course will be delivered in the form of lectures, demonstration during practical sessions, clinical teaching through case presentations/discussions, supervised clinical practice with self-directed and problem-solving principles and evidence-based practice in decision making of patient/client management. • 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	Apply a skilled and effective subjective and physical examination, using clinical decision making and perform physiotherapy management of a patient with upper extremity and Hand disorder (C3,P5,A3)
CO2	Choose and recommend a structured exercise program for Hand rehabilitation (C5, P5, A3)
CO3	List the assessment procedures and evidence based physiotherapy interventions and rehabilitation for common injuries of the upper extremity dysfunction (C4,P5,A3)
CO4	Analyze and apply evidence based practice for Hand conditions following trauma and surgeries of the Hand (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		
Physiotherapy evaluation and clinical reasoning in upper extremity and Hand	1. Apply the guidelines for physiotherapy evaluation and clinical reasoning in upper extremity and Hand conditions (C3, P4, A3) 2. Construct a structured assessment program for skin and soft tissue disorders of Hand (C3, P4, A3) 3. Demonstrate assessment for common tendon injuries and tendinopathy of the upper extremity (C3, P4, A3) 4. Analyse the rationale, analysis and performance of various outcome measures following tendon injury (C4, P4, A3) 5. Summarize, demonstrate assessment procedures following post- Hand surgery (C2, P4, A3) 6. Demonstrate the use of validated outcome tools for Hand and upper extremity (C3, P5, A3) 7. Identify and interpret the appropriate investigations and its uses in Peripheral Nerve lesions (C3, P5) 8. Explain the evidence informed assessment and management following peripheral nerve injuries (C3, P5) Perform physiotherapy assessment in clients with common injuries and complex Hand Injuries (C3, P5, A3) 9. Displays the ability to interpret investigations related to upper quarter dysfunction (C3, P5) 10. Discuss health related information with clients, caregivers, peers and health care professionals and displays ability to work as a team (C3, P5, A3) 11. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during fitness testing and exercise prescription in adolescent girls and female athlete (A4)	234
Unit 2		
Physiotherapy Management in upper extremity and Hand conditions	1. Organizes problem list and plan short term and long-term goals based on the evaluation findings following upper quarter dysfunction (C3, P5, A3) 2. Plan and perform Physiotherapy special	234

Content	Competencies	Number of Hours
	techniques in Hand rehabilitation (C3, P5, A3) 3. Summarize, demonstrate and justify the evidence based physiotherapy interventions and rehabilitation of post-Hand surgery (C2, P4, A3) 4. Explain the evidence informed management following peripheral nerve injuries (C3, P5) Perform physiotherapy assessment in clients with common injuries and complex Hand Injuries (C3, P5, A3) 5. Identify and plan the evidence based Physiotherapy management for chronic pain in upper extremity dysfunction (C5, P5, A3) 6. Evaluate and plan an evidence based physiotherapy management of common hand rehabilitation (C5, P5, A3) 7. Demonstrate Application of orthoses and prosthes in upper quarter dysfunction (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. Skirven TM, Osterman AL, Fedorczyk J, Amadio PC. Rehabilitation of the Hand and Upper Extremity, Elsevier Health Sciences; 2011. 2. Saunders R, Astifidis R, Burke SL, Higgins J, McClinton MA. Hand and Upper Extremity Rehabilitation: A Practical Guide. Elsevier Health Sciences; 2015. 3. Wilton J. Hand Splinting/Orthotic Intervention: Principles of design and fabrication. Vivid Publishing; 2014. 4. Weinzweig, N., Weinzweig, J., & Gu, Y. The mutilated hand. 2005 5. Wolfe SW, Pederson WC, Hotchkiss RN, Kozin SH, Cohen MS. Green's operative hand surgery. Elsevier Health Sciences; 2010. 6. Boscheinen-Morrin J, Conolly WB, Davey V. The hand: fundamentals of therapy. London: Butterworths 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 (Musculoskeletal Sciences)
Course Title	**Research Project in Musculoskeletal Sciences**
Course Code	**PTH7480**
Academic Year	Second
Semester	IV
Number of Credits	05
Course Prerequisite	Students should have advance 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	Perform data entry and prepare for analysis in statistical software (P4)	26

Content	Competencies	Number of Hours
Unit 2		
Statistical analysis	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	Prepare the dissertation document according to institutional guidelines (P4)Prepares manuscript for submission to an indexed journal (P4)	52
Unit 4		
Dissertation presentation	Present and defend the dissertation to the relevant scientific committee(s) (P4, A3)	13
Unit 5		
Closure report	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	C04	
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	**PTH6470**	Research Proposal in Musculoskeletal Physiotherapy	2	CO1	CO1 CO2			CO2			
II	**EPG6201**	Ethics and Pedagogy	2	CO1 CO2 CO3 CO4 CO5	CO4		CO1 CO2 CO3 CO5				
II	**PTH6402**	Foundations of Physiotherapy in Musculoskeletal sciences	3	CO1 CO2 CO3 CO4 CO5			CO2 CO4				
II	**PTH6404**	Physiotherapy clinical practice in Musculoskeletal sciences-I	12	CO1 CO3	CO1 CO2	CO2 CO4	CO3	CO4			
II	**PTH6480**	Research progress in Musculoskeletal sciences-I	2		CO2	CO2	CO1		CO1		
III	**PTH7401**	Physiotherapy in general Musculoskeletal sciences	3	CO1 CO2 CO3 CO4	CO1		CO3		CO4		
III	**PTH7403**	Physiotherapy clinical practice in Musculoskeletal sciences –II	12		CO1 CO2 CO3	CO1	CO4		CO2 CO3 CO4		
III	**PTH7405**	Evidence based physiotherapy practice in Musculoskeletal sciences	2	CO2 CO3					CO1 CO2 CO3	CO1	
III	**PTH7470**	Research Progress in Musculoskeletal sciences -II	3	CO1	CO1 CO3	CO2		CO2	CO3		

Sem.	Course Code	Course Title	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
IV	**PTH7412**	Manual therapy.	3	CO4	CO1	CO2 CO3	CO4	CO1 CO2	CO3		
IV	**PTH7414**	Clinical Practice in Manual Therapy	12		CO1 CO2	CO4	CO3	CO1 CO4	CO2		CO3
IV	**PTH7480**	Research project in Musculoskeletal sciences	5	CO1	CO1 CO3	CO3			CO2	CO2	
IV	**PTH7422**	Sports Physiotherapy	3	CO1	CO2 CO3	CO4		CO2 CO4	CO1	CO3	
IV	**PTH7424**	Clinical in Practice in Sports Physiotherapy	12	CO3	CO1 CO2	CO4	CO4	CO1	CO2		CO8
IV	**PTH7480**	Research Project in Musculoskeletal sciences	5	CO1	CO1 CO3	CO3			CO2	CO2	
IV	**PTH7432**	Hand Rehabilitation	3	CO2	CO3	CO1	CO3 CO4	CO2 CO4	CO1		
IV	**PTH7434**	Clinical Practice in Hand rehabilitation	12		CO1 CO4	CO4	CO2	CO5	CO2 CO3		CO4
IV	**PTH7480**	Research Project in Musculoskeletal 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

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

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).

8.3 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**