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

Manipal College of Health Professions

Manipal Academy of Higher Education, Manipal

Outcome-Based Education (OBE) Framework

Four and a half years

Full time undergraduate program

Bachelor of Physiotherapy

With effect from July 2020

T A B L E O F C O N T E N T S

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 50 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 provide an almost unending canvas to work on.

Aim of the Program:

i) To educate and train the student to independently evaluate, assess, diagnose, prescribe, plan and practice Physiotherapy in a competent manner towards those who need such services, with autonomy in quality assurance and maintaining the humanitarian approach of service.

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

Duration of the Program: Four years and six months

- Eight Semesters (Four years) of academic program
- Six months of compulsory rotatory internship

Entry level Qualification:

i) The candidate must have passed 10+2/A level IB/ American 12th grade of equivalent with Physics, Chemistry, Biology and English as subjects.

ii) The candidate should have obtained an aggregate of 50% in Physics, Chemistry and Biology.

Scope of the Program:

On completion of the B.P.T. program, the graduates have job opportunities in various acute care hospitals, rehabilitation centers, multispecialty hospitals, special schools, geriatric

centers, private organizations, non-government organizations and government institutions. Graduates can also pursue higher studies in clinical areas of their interest in the Master of Physiotherapy program and become teaching faculty in the academic institutions. Graduates can work in the community set up and in industries as ergonomic advisors. Graduates may also undertake research in Physiotherapy. Physiotherapy is one of the fastest growing professions in USA, Australia and UK, it offers tremendous opportunity abroad.

2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The overall objectives of the learning outcome-based curriculum framework (LOCF) for Bachelor of Physiotherapy program are as follows:

PEO No.	Education Objective
PEO 1	Students will be able to use their fundamental knowledge and clinical competence in Physiotherapy as and when required to achieve professional excellence.
PEO 2	Students will demonstrate strong and well defined clinical and practical skills in Physiotherapy
PEO 3	Students will be able to practice the profession with highly professional and ethical attitude, strong communication skills, and effective professional skills to work in a inter-disciplinary team.
PEO 4	Students will be able to use interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution.
PEO 5	Students will be able to imbibe the culture of research, innovation, entrepreneurship and incubation.
PEO 6	Students will be able to participate in 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**	Demonstrate scientific knowledge and understanding to work as a health care professional
2	**Clinical / practical skills**	Demonstrate Clinical / practical skills in order to implement the preventive, assessment and management plans for quality health care services
3.	**Communication**	Ability to communicate effectively and appropriately in writing and orally to patients/clients, care-givers, other health professionals and other members of the community
4.	**Cooperation/Team work**	Ability to work effectively and respectfully with interdisciplinary team members to achieve coordinated, high quality health care
5.	**Professional ethics**	Ability to identify ethical issues and apply the ethical values in the professional life
6.	**Research / Innovation-related Skills**	A sense of inquiry and investigation for raising relevant and contemporary questions, synthesizing and articulating.
7.	**Critical thinking and problem solving**	Ability to think critically and apply once learning to real-life situations
8.	**Reflective thinking**	Ability to employ reflective thinking along with the ability to create the sense of awareness of one self and society
9.	**Information/digital literacy**	Ability to use ICT in a variety of learning situations
10.	**Multi-cultural competence**	Ability to effectively engage in a multicultural society and interact respectfully
11.	**Leadership readiness/qualities**	Ability to respond in an autonomous and confident manner to planned and uncertain situations, and should be able to manage themselves and others effectively
12.	**Lifelong Learning**	Every graduate to be converted into lifelong learner and consistently update himself or herself with current knowledge, skills and technologies. Acquiring Knowledge and creating the understanding in learners that learning will continue throughout life.

4. QUALIFICATION DESCRIPTORS:

a) Demonstrate (i) a fundamental and systematic knowledge and understanding of an 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) Demonstrate 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) Demonstrate 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) Use knowledge, understanding and skills for critical assessment of a wide range of ideas and complex problems and issues relating to Physiotherapy

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

f) Address one's own learning needs relating to current and emerging areas of study, making use of research, development and professional materials as appropriate, including those related to new frontiers of knowledge

g) Apply 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 Bachelor of Physiotherapy program, students will be able to:

PO No.	Attribute	Competency
PO 1	**Professional knowledge**	Possess and acquire **scientific knowledge** to work as a health care professional
PO 2	**Clinical/ Technical skills**	Demonstrate and possess **clinical skills** to provide quality health care services
PO 3	**Team work**	Demonstrate **team work skills** to support shared goals with the interdisciplinary health care team to improve societal health
PO 4	**Ethical value & professionalism**	Possess and demonstrate **ethical values and professionalism** within the legal framework of the society
PO 5	**Communication**	**Communicate effectively** and appropriately with the interdisciplinary health care team and the society
PO 6	**Evidence based practice**	Demonstrate high quality **evidence based practice** that leads to excellence in professional practice
PO 7	**Life-long learning**	Enhance knowledge and skills with the use of advancing technology for the **continual improvement** of professional practice
PO 8	**Entrepreneurship, leadership and mentorship**	Display **entrepreneurship, leadership and mentorship** skills to practice independently as well as in collaboration with the interdisciplinary health care team

6. COURSE STRUCTURE, COURSE WISE LEARNING OBJECTIVE, AND COURSE OUTCOMES

SEMESTER - I

Course code	Course Title	Credit distribution (L, T & P are hours/week)				Marks distribution		
		L	T	P	Credits	IAC	ESE	Total
ANA1101	Anatomy - I	3	-	-	3	30	70	100
ANA1111	Anatomy Practical - I	-	-	4	2	30	70	100
PHY1101	Physiology - I	2	-	-	2	30	70	100
PTH1101	Theoretical concepts in Basics of Exercise Therapy - I	1	1	-	2	50	50	100
PTH1111	Practical in Basics of Exercise Therapy - I	-	-	4	2	100	-	100
PTH1102	Biophysics and Basics of Electrotherapy	2	1	-	3	50	50	100
PTH1123	Foundations of Professional practice	1	-	2	2	100	-	100
CSK1001	Communication Skills	2	-	-	2	100	-	100
EIC1001	Environmental Science and Indian Constitution	2	-	-	2	100	-	100
	Total	**13**	**2**	**10**	**20**	**590**	**310**	**900**

Note:
- ESE in ANA1101, and PHY1101 will be conducted for 50 marks and normalized to 70 marks
- ESE in PTH1102 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - II

Course code	Course Title	Credit distribution (L, T & P are hours/week)				Marks Distribution		
		L	T	P	Credits	IAC	ESE	Total
ANA1201	Anatomy - II	2	-	-	2	30	70	100
ANA1211	Anatomy Practical - II	-	-	4	2	30	70	100
PHY1201	Physiology - II	2	-	-	2	30	70	100
BIC1201	Biochemistry	3	-	-	3	30	70	100
PTH1201	Theoretical concepts in Basics of Exercise Therapy - II	2	1	-	3	50	50	100
PTH1211	Practical in Basics of Exercise Therapy - II	-	-	4	2	100	-	100
PTH1202	Theoretical concepts in Electrotherapy - I	1	1	-	2	50	50	100
PTH1212	Practical in Electrotherapy - I	-	-	4	2	100	-	100
PTH1203	Applied Anatomy and Applied Physiology	-	2	-	2	100	-	100
	Total	**10**	**4**	**12**	**20**	**520**	**380**	**900**

Note:
- ESE in ANA1201, PHY1201 and BIC1201 will be conducted for 50 marks and normalized to 70 marks for grading
- ESE in PTH1201 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - III

Course code	Course Title	Credit distribution (L,T & P are hours/ week)				Marks Distribution		
		L	T	P	Credits	IAC	ESE	Total
PAT2103	Pathology	3	-	-	3	30	70	100
MCB2102	Microbiology	2	-	-	2	100	-	100
PTH2101	Biomechanics	2	1	-	3	50	50	100
PTH2102	Theoretical concepts in Exercise therapy - I	2	1	-	3	50	50	100
PTH2111	Practical in Exercise therapy - I	-	-	4	2	100	-	100
PTH2103	Theoretical concepts in Electrotherapy - II	1	1	-	2	50	50	100
PTH2112	Practical in Electrotherapy - II	-	-	4	2	100	-	100
*** ****	Open elective - I	-	-	-	3	S/NS		
	Total	**10**	**3**	**8**	**20**	**480**	**220**	**700**

Note:
- ESE in PAT2103 will be conducted for 50 marks and normalized to 70 marks for grading
- ESE in PTH2101 and PTH2102 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - IV

Course code	Course Title	Credit distribution (L, T, P & C are hours/week)					Marks Distribution		
		L	T	P	C	Credits	IAC	ESE	Total
PHC2201	Pharmacology	2	-	-	-	2	30	70	100
CPY2201	Clinical Psychology	3	-	-	-	3	30	70	100
YGA2221	Fundamentals of Yoga Therapy	1	-	2		2	100	-	100
PTH2201	Exercise Physiology	2	1	-	-	3	50	50	100
PTH2202	Theoretical concepts in Exercise therapy -II	2	1	-	-	3	50	50	100
PTH2211	Practical in Exercise therapy - II	-	-	6	-	3	100	-	100
PTH2203	Ethics, Entrepreneurship, and Leadership	1	1	-	-	2	100	-	100
PTH2231	Clinical Practice	-	-	-	6	2	100	-	100
	Total	**11**	**3**	**8**	**6**	**20**	**560**	**240**	**800**

Note:
- ESE in PHC2201 and CPY2201 will be conducted for 50 marks and normalized to 70 marks for grading
- ESE in PTH2201 and PTH2202 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - V

Course code	Course Title	Credit distribution (L,T & P are hours/ week)					Marks Distribution		
		L	T	P	C	Credits	IAC	ESE	Total
NEP3101	Neurosciences and Paediatrics	3	-	-	-	3	30	70	100
ORT3101	Orthopaedics	2	-	-	-	2	30	70	100
PTH3101	Theoretical concepts in Neurological Physiotherapy - I	2	1	-	-	3	50	50	100
PTH3131	Clinical Practice in Neurological Physiotherapy - I	-	-	-	6	2	100	-	100
PTH3102	Theoretical concepts in Musculoskeletal Physiotherapy - I	2	1	-	-	3	50	50	100
PTH3132	Clinical Practice in Musculoskeletal Physiotherapy - I	-	-	-	6	2	100	-	100
PTH3111	Neuromusculoskeletal skills - I	-	-	4	-	2	100	-	100
*** ****	Open Elective - II	-	-	-	-	3	S/NS		
	Total	**9**	**2**	**4**	**12**	**20**	**460**	**240**	**700**

Note:
- ESE in NEP3101 and ORT3101 will be conducted for 50 marks and normalized to 70 marks for grading
- ESE in PTH3101 and PTH3102 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - VI

Course code	Course Title	Credit distribution (L, T, P & C are hours/week)					Marks Distribution		
		L	T	P	C	Credits	IAC	ESE	Total
BST3201	Biostatistics and Research Methodology	3	-	-	-	3	30	70	100
MED3201	General Medicine	3	-	-	-	3	30	70	100
PTH3201	Theoretical concepts in Neurological Physiotherapy - II	2	-	-	-	2	50	50	100
PTH3231	Clinical Practice in Neurological Physiotherapy - II	-	-	-	6	2	50	50	100
PTH3202	Theoretical concepts in Musculoskeletal Physiotherapy - II	2	1	-	-	3	50	50	100
PTH3232	Clinical Practice in Musculoskeletal Physiotherapy - II	-	-	-	6	2	50	50	100
PTH3211	Neuromusculoskeletal skills - II	-	-	4	-	2	100	-	100
PTH****	Program Elective - I	2	1	-	-	3	50	50	100
	Total	**12**	**2**	**4**	**12**	**20**	**410**	**390**	**800**

Note:
- ESE in BST3201 will be conducted for 100 marks and normalized to 70 marks for grading
- ESE in MED3201 will be conducted for 50 marks and normalized to 70 marks for grading
- PTH3202 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - VII

Course code	Course Title	Credit distribution (L,T & P are hours/ week)					Marks Distribution		
		L	T	P	C	Credits	IAC	ESE	Total
SUR4101	General Surgery	3	-	-	-	3	30	70	100
CMS4101	Community Medicine And Sociology	3	-	-	-	3	30	70	100
PTH4101	Theoretical concepts in Cardiopulmonary Physiotherapy - I	3	-	-	-	3	50	50	100
PTH4131	Clinical Practice in Cardiopulmonary Physiotherapy - I	-	-	-	6	2	100	-	100
PTH4102	Theoretical concepts in Community Physiotherapy	3	-	-	-	3	50	50	100
PTH4132	Community Physiotherapy Practice	-	-	-	6	2	50	50	100
PTH4103	Evidence Based practice in Physiotherapy	1	1	-	-	2	100	-	100
PTH4111	Cardiopulmonary and Community Physiotherapy skills	-	-	4	-	2	100	-	100
	Total	**13**	**1**	**4**	**12**	**20**	**510**	**290**	**800**

Note:
- ESE in SUR4101 and CMS4101 will be conducted for 50 marks and normalized to 70 marks for grading
- ESE in PTH4101 and PTH4102 will be conducted for 100 marks and normalized to 50 marks for grading

SEMESTER - VIII

Course code	Course Title	Credit distribution (L, T, P & C are hours/week)					Marks Distribution		
		L	**T**	**P**	**C**	**Credits**	**IAC**	**ESE**	**Total**
PTH4201	Theoretical concepts in Cardiopulmonary Physiotherapy - II	2	-	-	-	2	50	50	100
PTH4231	Clinical Practice in Cardiopulmonary Physiotherapy - II	-	-	-	6	2	50	50	100
PTH4202	Theoretical concepts for Physiotherapy in Special Conditions	1	1	-	-	2	50	50	100
PTH4232	Clinical practice in Physiotherapy for Special Conditions	-	-	-	6	2	50	50	100
PTH4203	Electrodiagnosis	2	1	-	-	3	50	50	100
PTH4251	Research proposal and scientific writing	1	3	-	-	4	100	-	100
PTH4211	Physiotherapy skills in Cardiopulmonary and special conditions	-	-	4	-	2	100	-	100
PTH****	Program Elective - II	-	-	-	-	3	50	50	100
	Total	**6**	**5**	**4**	**12**	**20**	**500**	**300**	**800**

Note:
- ESE in PTH4203 will be conducted for 100 marks and normalized to 50 marks for grading

Open Electives

Open elective is credited, choice-based and is graded as satisfactory / not satisfactory (S/NS). Students make a choice from pool of electives offered by MAHE institution / Online courses as approved by the department

Program Electives

Program elective is credited and choice-based. The students make a choice from pool of electives offered by the department. The ESE is conducted for 50 marks.

Semester	Course Code	Course Title	Credit (s) Distribution (L,T,P,CL are hours/ week)				
			L	T	P	CL	CR
VI Semester	PTH3241	Movement science in Neurorehabilitation	2	1	-	-	3
	PTH3242	Pain sciences	2	1	-	-	3
VIII Semester	PTH4241	Disability and Health	1	2	-	-	3
	PTH4242	Cancer rehabilitation	2	1	-	-	3

SEMESTER IX (INTERNSHIP)

Course Title	Credit distribution (L, T, P & C are hours/week)					Marks Distribution		
	L	T	P	C	Credits	IAC	ESE	Total
Internship	-	-	-	48	NA	-	-	-
Duration: 6 months/ 26 weeks Total Contact/ Clinical hours: 1,248								

OVERALL CREDIT DISTRIBUTION

Semester	Hours per week				Total Credits	Marks		
	L	T	P	C		IAC	ESE	Total
Semester - I	13	2	10	-	20	590	310	900
Semester - II	10	4	12	-	20	520	380	900
Semester - III	10	3	8	-	20	480	220	700
Semester - IV	11	3	8	6	20	560	240	800
Semester - V	9	2	4	12	20	460	240	700
Semester - VI	12	2	4	12	20	410	390	800
Semester - VII	13	1	4	12	20	510	290	800
Semester - VIII	6	5	4	12	20	500	300	800
Semester - IX (Internship)	-	-	-	48	NA	-	-	-
Total	**84**	**22**	**54**	**102**	**160**	**4030**	**2370**	**6400**

SEMESTER - I

COURSE CODE	:	COURSE TITLE
ANA1101	:	Anatomy - I
ANA1111	:	Anatomy Practical - I
PHY1101	:	Physiology - I
PTH1101	:	Theoretical concepts in Basics of Exercise Therapy - I
PTH1111	:	Practical in Basics of Exercise Therapy - I
PTH1102	:	Biophysics and Basics of Electrotherapy
PTH1123	:	Foundations of Professional practice
CSK1001	:	Communication Skills
EIC1001	:	Environmental Sciences and Indian Constitution

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	Anatomy - I
Course Code	**ANA1101**
Academic Year	First
Semester	I
Number of Credits	3
Course Prerequisite	Basic knowledge of biology
Course Synopsis	Human anatomy is the study of gross features and relations of various structures of the human body by dissection.

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

CO1	Explain the General Anatomy in the human body (C2)
CO2	Explain the Systemic Anatomy of the human body (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours (Theory)**
Unit 1:		
General Anatomy	• Define the Anatomical position and Anatomical terms (C1) • Explain the epithelium – types and functions (C2) • Explain the connective tissue – fibers and cells (C2) • Explain the cartilage – types, structure and function (C2) • Explain the bone – types, structure and blood supply (C2) • Explain the muscle – classification, structure and function (C2) • Explain the neurons- types and structure, typical spinal nerve (C2) • Explain the blood vessels – arteries, veins, lymph vessels, lymph nodes, structure of lymph node (C2) • Explain the joints: Classification, examples , structure of a typical synovial joint (C2) • Explain the classification of synovial joints (C2)	7
Unit 2:		
Respiratory system	• List the parts of respiratory tract (C1) • Explain the boundaries of the Nasal cavity (C2)	5

Content	Competencies	Number of Hours (Theory)
	• Explain the Lateral wall of nasal cavity - features, blood supply, nerve supply and lymphatic drainage (C2) • Explain the nasal septum: Formation, blood supply, nerve supply, lymphatic drainage and applied anatomy (C1, C2) • List and Explain the paranasal air sinuses and their function (C1, C2) • Explain the pharynx - extent, parts- nasopharynx oropharynx and laryngopharynx - internal features (C2) • Explain the cavity of larynx, blood supply, nerve supply (C1, C2) • Explain the vocal cords and their movements, and Rima glottidis (C2) • List the intrinsic muscles of the larynx, their nerve supply and actions (C1) • List the Cartilaginous framework and ligaments (C1) • Explain the trachea: Extent, Structure and nerve supply (C2) • Explain the diaphragm - attachments, nerve supply and actions (C2) • Explain the thoracic cage: thoracic wall, intercostal spaces and their contents (C1, C2) • Explain the Lungs- gross anatomy, roots of the lungs, surface marking of pleura and lungs (C1, C2) • Explain the pleura- parts, pleural cavity, pleural recesses, pulmonary ligament (C2)	
Unit 3:		
Cardiovascular system	• Explain the heart - position, external features, right atrium internal features (C1, C2) • Explain the right ventricle internal features, Blood supply to the heart (C1, C2) • Explain the left atrium and left ventricle, nerve supply of heart (C2) • Explain the pericardium - Parts, blood supply, nerve supply and function (C2) • Explain the mediastinum - boundaries and contents (C2) • List and explain the arteries - Arch of aorta and descending thoracic aorta (extent course and branches) (C1, C2) • Explain the veins -Azygos system of vein (formation, course and termination) (C1, C2) • Define the thoracic duct: formation, course and termination (C2) • Explain the arteries - pulmonary trunk, ascending aorta (extent course and branches) (C2) • Explain the veins - branchiocephalic veins, superior	4

Content	Competencies	Number of Hours (Theory)
	vena cava (formation, course and termination) (C2) • Explain the major arteries and veins of head and neck (name and positions) (C2) • Explain the major arteries and veins of abdomen and pelvis (name and positions) (C2) • Explain the abdominal aorta, inferior vena cava, portal vein (C1, C2)	
Unit 4:		
Digestive system	• List the parts of digestive system (C1) • Explain the tongue – gross anatomy, blood supply and nerve supply (C2) • Explain the salivary glands- Names and location (C2) • Explain the oesophagus- extent, parts, constrictions, blood supply, nerve supply and lymphatic drainage (C2) • Explain the stomach- position, relations, blood supply, nerve supply and lymphatic drainage (C1, C2) • Explain the duodenum- parts, important relations, blood supply and nerve supply (C2) • Explain the pancreas – position, parts, important relations, blood supply and nerve supply (C2) • Explain the small intestine – parts- duodenum, jejunum and ileum- blood supply and nerve supply (C1, C2) • Explain the large intestine – parts, position of each of the parts, extent, blood supply and nerve supply (C2) • List the differences between jejunum and ileum (C1) • List the differences between small intestine and large intestine (C1) • Explain the rectum and anal canal-position, blood supply, nerve supply and lymphatic drainage (C2) • Explain the liver- position, anatomical and physiological lobes, surfaces, relations, porta hepatis, blood supply and nerve supply (C1, C2) • Explain the extrahepatic biliary apparatus – gall bladder and bile duct (C2)	6
Unit 5:		
Urinary system	• List the parts of urinary system (C1) • Explain the kidneys: position, external features, capsules, relations, macroscopic structure, blood supply and nerve supply (C1, C2) • Explain the ureter- length, constrictions and blood supply (C2) • Explain the urinary bladder- position, external features, blood supply and nerve supply (C2)	2

Content	Competencies	Number of Hours (Theory)
	• Explain the urethra- female urethra, male urethra- parts (C2)	
Unit 6:		
Male reproductive system	• List the parts of male reproductive system (C1) • List the spermatic cord- constituents and coverings (C1) • Explain the testes- position, coverings, gross structure, blood supply, nerve supply and lymphatic drainage (C2) • Explain the vas deferens- commencement, course and termination (C2) • Explain the prostate – position, external features, lobes and structure (C2) • Explain the seminal vesicles and ejaculatory ducts (C2)	2
Unit 7:		
Female reproductive system	• Name the parts of female reproductive system (C1) • Explain the uterus-position, parts, external features, relations, blood supply and lymphatic drainage (C2) • Explain the uterine tube- parts, blood supply and nerve supply (C2) • Explain the ovary – position and structure (C2)	2
Unit 8:		
Endocrine glands	• Name the endocrine glands (C1) • Explain the pituitary gland (Hypophysis cerebri)- position, parts, blood supply (C2) • Explain the suprarenal glands- position, relations, parts, blood supply and lymphatic drainage (C2) • Explain the thyroid gland- position, parts, blood supply and lymphatic drainage (C2) • Name the parathyroid glands-their position and blood supply (C1)	2
Unit 9:		
Central Nervous system	• Name the parts of the CNS (C1) • List the features and explain the spinal cord- position, external features, internal structure, brief note on important ascending and descending tracts (C1, C2) • Explain the major motor and sensory pathways (C2) • Explain the pyramidal tract in detail (C2) • Name the parts of brain (C2) • List the external and internal features of medulla oblongata (C1) • List the cranial nerves attached to medulla oblongata (C1) • List the external and internal features pons (C1) • Explain the cranial nerves attached to pons and ponto-medullary junction (C2)	12

Content	Competencies	Number of Hours (Theory)
	• Explain the cerebellum- functional lobes of the cerebellum and its functions (C2) • Explain the midbrain- external features and internal structure – in brief (C1) • Explain the cranial nerves attached to midbrain (C2) • Explain the cerebral hemispheres – lobes, important sulci and functional areas (C2) • List the fiber system of the brain and explain the corpus callosum and internal capsule (C1, C2) • Explain the diencephalon- Thalamus and hypothalamus-position and functions (C2) • Explain the basal nuclei: Corpus striatum – parts and functions (C2) • Explain the blood supply to the central nervous system (C2) • Explain the ventricles: 4th and 3rd ventricles (features, position and communications) (C2) • Explain the lateral ventricles- parts, features, position and communications (C2) • Define the CSF production and circulation (C1)	
Unit 10:		
Special senses	• Recall the gross anatomy of the eye (C1) • Recall the gross anatomy of external, middle and internal ear (C1) • Recall the skin and its features (C1)	3

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	45	135
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**45**	**135**

Assessment Methods:	
Formative:	**Summative:**
Unit Test	Sessional Exam I / Sessional Exam II (Theory)

Quiz/ MCQ/MTF			End Semester Exam (Theory)				
Viva							
Assignments/Presentations							
Clinical assessment (OSCE, OSPE, WBPA)							
Clinical/Practical Log Book/ Record Book							
Mapping of Assessment with COs:							
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Sessional Examination 1		x	x				
Sessional Examination 2		x	x				
End Semester Exam		x	x				
Feedback Process:	Mid-Semester Feedback						
	End-Semester Feedback						
Main Reference:	1. Manipal Manual of Anatomy by Dr. Sampath Madhyastha						
Additional References	1. Human Anatomy by Dr. B. D. Chaurasia (Vol 1,2,3,4) 2. Chaurasia's handbook of human anatomy 3. Netter's Atlas						

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	Anatomy Practical -I
Course Code	**ANA1111**
Academic Year	First
Semester	I
Number of Credits	2
Course Prerequisite	Basic knowledge of general anatomy
Course Synopsis	Human anatomy is the study of gross features and relations of various structures of the body by dissection.

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

CO1	Identify and explain the General Anatomy in the human body (C1, P1)
CO2	Identify and explain the Systemic Anatomy of the human body (C2, P2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
• Orientation about dissection hall, disciplines and precautionary measures to be taken during dissection sessions		
Unit 2:		
Respiratory system	• Identify the parts of respiratory tract (C1, P1) • Explain and identify the Nasal cavity under: (C2, P1) • Boundaries Lateral wall - features, blood supply, nerve supply and lymphatic drainage Nasal septum: Formation, blood supply, nerve supply, lymphatic drainage and applied anatomy Paranasal air sinuses and their function • Explain and identify the pharynx under - extent, parts- nasopharynx, oropharynx and laryngopharynx - internal features (C2, P1) • Explain and identify the larynx under: (C2, P1) Cartilaginous framework and ligaments, Cavity of larynx, blood supply, nerve supply Vocal cords and their movements	12

Content	Competencies	Number of Hours
	Rima glottidis Names of the intrinsic muscles of the larynx, their nerve supply and actions • Explain and identify the thoracic cage: thoracic wall, intercostal spaces and their contents (C2, P1) • Explain and identify the mediastinum - boundaries and contents (C2, P1) • Explain and identify the diaphragm - attachments, nerve supply and actions (C2, P1) • Explain and identify the trachea: Extent, Structure and nerve supply (C2, P1) • Define and identify the pleura- parts, pleural cavity, pleural recesses, pulmonary ligament (C1, P1) • Explain and identify the lungs- gross anatomy, roots of the lungs, surface marking of pleura and lungs (C2, P1)	
Unit 3:		
Cardiovascular system	• Explain and identify the pericardium – parts, blood supply, nerve supply and function (C2, P1) • Explain and identify heart – position, external features (C2, P2) • Explain and identify right atrium, left atrium, right ventricle & left ventricle- internal features (C2, P2) • Explain and identify blood supply to the heart and nerve supply of heart (C2, P2) • Vessels • Explain and identify the arteries – Arch of aorta, pulmonary trunk, ascending aorta and descending thoracic aorta (extent course and branches) (C1, P1) • Explain and identify the major arteries and veins of head and neck (name and positions) (C1, P1) • Explain and identify the major arteries and veins of abdomen and pelvis (name and positions) (C1, P1) • Explain and identify the abdominal aorta- (extent course and branches) (C1, P1) • Explain and identify the veins –Azygos system of vein, branchiocephalic veins, superior vena cava, inferior vena cava, portal vein (formation, course and termination) (C1, P1) • Explain and identify the thoracic duct: formation, course and termination (C1, P1)	4
Unit 4:		
Digestive system	• Explain and identify the tongue – gross anatomy, blood supply and nerve supply (C1, P1) • Explain and identify the salivary glands: Location (C1, P1)	4

Content	Competencies	Number of Hours
	• Explain and identify the oesophagus- extent, parts, constrictions, blood supply, nerve supply and lymphatic drainage (C1, P1) • Explain and identify the stomach- position, relations, blood supply, nerve supply and lymphatic drainage (C1, P1) • Explain and identify the small intestine – parts- duodenum, jejunum and ileum- blood supply and nerve supply (C1, P1) • Explain and identify the duodenum- parts, important relations, blood supply and nerve supply (C1, P1) • Explain and identify the large intestine – parts, position of each of the parts, extent, blood supply and nerve supply (C1, P1) • List the differences between jejunum and ileum (C1, P1) • List the differences between small intestine and large intestine (C1, P1) • Explain and identify the rectum and anal canal- position, blood supply, nerve supply and lymphatic drainage (C1, P1) • Explain and identify the pancreas – position, parts, important relations, blood supply and nerve supply (C1, P1) • Explain and identify the liver- position, anatomical and physiological lobes, surfaces, relations, porta hepatis, blood supply and nerve supply (C1, P1) • Explain and identify the extrahepatic biliary apparatus – gall bladder and bile duct (C1, P1)	
Unit 5:		
Urinary system	• Explain and identify the kidneys: position, external features, capsules, relations, macroscopic structure, blood supply and nerve supply (C1, P1) • Explain and identify the ureter- length, constrictions and blood supply (C1, P1) • Explain and identify the urinary bladder- position, external features, blood supply and nerve supply (C1, P1) • Explain and identify the urethra- female urethra, male urethra- parts (C1, P1)	2
Unit 6:		
Male reproductive system	• Explain and identify the spermatic cord- constituents and coverings (C1, P1) • Explain and identify the testes- position, coverings, gross structure, blood supply, nerve supply and lymphatic drainage (C1, P1) • Explain and identify the vas deferens-	2

Content	Competencies	Number of Hours
	commencement, course and termination (C1,P1) • Explain and identify the prostate – position, external features, lobes and structure (C1,P1) • Seminal vesicles and ejaculatory ducts (C1,P1)	
Unit 7:		
Female reproductive system	• Explain and identify the uterus-position, parts, external features, relations, blood supply and lymphatic drainage (C1,P1) • Explain and identify the uterine tube- parts, blood supply and nerve supply (C1,P1) • Explain and identify the ovary – position and structure (C1,P1)	2
Unit 8:		
Endocrine glands	• Explain and identify the pituitary gland (Hypophysis cerebri)-position, parts, blood supply (C1,P1) • Explain and identify the suprarenal glands-position, relations, parts, blood supply and lymphatic drainage (C1, P1) • Explain and identify the thyroid gland- position, parts, blood supply and lymphatic drainage (C1, P1) • Explain and identify the parathyroid glands-position and blood supply (C1, P1)	2
Unit 9:		
Central Nervous system	• Introduction to CNS (C1) • Explain and identify the spinal cord- position, external features, internal structure, brief note on important ascending and descending tracts (C1, P1) • Explain and identify the pyramidal tract in detail (C1,P1) • Naming the parts of brain (C1, P1) • Explain and identify the external and internal features of medulla oblongata (C1, P1) • Explain and identify the cranial nerves attached to medulla oblongata (C1, P1) • Explain and identify the external and internal features pons (C1, P1) • Explain and identify the cranial nerves attached to pons and pontomedullary junction (C1, P1) • Explain and identify the cerebellum- functional lobes of the cerebellum and its functions (C1, P1) • Explain and identify the midbrain- external features and internal structure – in brief (C1, P1) • Explain and identify the cranial nerves attached to midbrain (C1, P1) • Explain and identify the cerebral hemispheres – lobes, important sulci and functional areas (C1,	12

Content	Competencies	Number of Hours
	P1) • Explain and identify the fiber system of the brain –corpus callosum and internal capsule (C1,P1) • Explain and identify the diencephalon- Thalamus and hypothalamus-position and functions (C1, P1) • Explain and identify the basal nuclei: Corpus striatum – parts and functions (C1, P1) • Explain and identify the ventricles: 4th and 3rd ventricles (features, position and communications) (C1, P1) • Explain and identify the lateral ventricles- parts, features, position and communications (C1, P1) • Explain and identify the CSF production and circulation (C1, P1) • Explain and identify the blood supply to the central nervous system (C1, P1)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical (02 hrs each)	40	120
Revision	04	12
Assessment	03	09
Total	**47**	**141**

Assessment Methods:	
Formative:	**Summative:**
Unit Test	
Quiz/Spotters	End Semester Exam Practical
Viva	Viva
Assignments/Presentations	
Clinical assessment (OSCE, OSPE, WBPA)	
Clinical/Practical Log Book/ Record Book	

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x				
Quiz / Viva	x	x				

End Semester Exam		x	x				
Feedback Process:	Mid-Semester Feedback						
	End-Semester Feedback						
Main Reference:	2. Manipal Manual of Anatomy by Dr. Sampath Madhyastha						
Additional References	1. Human Anatomy by Dr. B. D. Chaurasia (Vol 1,2,3,4) 2. Chaurasia'a handbook of General Anatomy 3. Netter's Atlas						

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Physiology - I**
Course Code	**PHY1101**
Academic Year	First
Semester	I
Number of Credits	2
Course Prerequisite	Basic knowledge of biology
Course Synopsis	This module provides a comprehensive knowledge about normal functions of the organ systems of the body to understand the physiological basis of health and disease required for health professional (paramedical) courses.

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

CO1	Know the basic facts and concepts of Physiology (C1)
CO2	Explain the normal functions of various systems of the body.(C2)
CO3	Describe the relative contribution of various systems in maintaining the homeostasis.(C2)
CO4	Explain the physiological basis of disease processes.(C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1. BASIC CONCEPTS AND NERVE PHYSIOLOGY		
Transport across cell membrane	• Name the various transport mechanisms across cell membrane(C1) • Describe passive transport mechanisms such as simple diffusion, facilitated diffusion and osmosis (C2) • Describe primary and secondary active transport mechanisms(C2)	4
Body fluid compartments	• Mention the total body water as percentage of body weight and its distribution. (C1) • Give the ionic composition of body fluids(C1)	
Physiology of neuron	• Describe the morphology of a neuron (C2) • Mention the structure and functions of myelinated and	

Content	Competencies	Number of Hours
	unmyelinated nerve fibers (C2)	
Membrane potential	• Describe resting membrane potential(C2) • Draw and label the action potential (C2) • Describe the ionic basis of the action potential (C2)	
Unit 2: MUSCLE PHYSIOLOGY		
Skeletal muscle	• Describe the characteristic features of skeletal, cardiac and smooth muscles(C2) • Describe the structure of skeletal muscles(C2) • Mention the types of skeletal muscles(C1) • Explain neuromuscular transmission in skeletal muscle(C2) • Explain excitation contraction coupling in skeletal muscle(C2) • Describe rigor mortis (C2)	4
Smooth muscle	• Mention the types of smooth muscle(C1)	
Unit 3: BLOOD		
Composition and functions of blood	• Describe the composition of blood(C2) • List the functions of blood(C1)	6
Plasma proteins	• Name the different types of plasma proteins (C1) • List the functions of plasma proteins(C1)	
Red blood cells	• Mention the morphology and functions of red blood cells (C1) • Mention the normal count of RBC and its variations (C1) • Describe the stages and factors influencing erythropoiesis(C2) • Mention the normal value of hemoglobin concentration and its variations(C1) • Mention the functions of hemoglobin (C1) • Define anemia(C1)	
White blood cells	• Classify White Blood Cells (WBC) (C2) • List the functions of WBCs(C1) • Mention the normal count of various types of WBCs (C1)	
Hemostasis	• Mention the normal range of platelets and its variations(C1) • List the functions of platelets(C1) • Define hemostasis(C1) • Describe the various stages involved in haemostasis (C2) • List the clotting factors(C1) • Describe the intrinsic and extrinsic pathways of coagulation (C2) • Describe hemophilia(C2) • Classify anticoagulants and give examples for each(C2)	

Content	Competencies	Number of Hours
Blood types/groups	• Describe the ABO and Rh systems of blood grouping(C2) • Explain the importance of blood grouping(C2) • Mention the hazards of blood transfusion(C1) • Explain the cause and clinical features of hemolytic disease of the newborn (erythroblastosis fetalis) (C2)	
Lymph	• List the functions of lymph(C1)	
Unit 4: CARDIOVASCULAR SYSTEM		
Organization of cardiovascular system	• Describe the structure of heart (C2) • Describe the innervation of heart and blood vessels(C2) • Describe the properties of cardiac muscle(C2)	9
Cardiac cycle	• Define cardiac cycle (C1) • State the normal duration of cardiac cycle (C1) • Explain the various events occurring during a cardiac cycle with the help of graphs(C2)	
Heart sounds	• Enumerate the differences between first and second heart sounds(C2)	
Electrocardiogram (ECG)	• Define electrocardiogram (ECG) (C1) • Draw a labeled diagram of a normal ECG recorded from limb lead II (C1) • Describe the waves and intervals of ECG (C2) • Mention the uses of ECG(C1)	
Heart rate	• Mention the normal value and variations of heart rate(C1) • Describe the regulation of heart rate(C2)	
Cardiac output	• Define cardiac output (C1) • State the normal value of cardiac output (C1) • Mention the variations of cardiac output(C1) • Describe the regulation of cardiac output(C2) • Mention the effect of muscular exercise on cardiac output (C1)	
Blood pressure (BP)	• Define blood pressure (BP) (C1) • Mention the normal value of BP (C1) • Mention the factors influencing BP(C1) • Mention the variations of blood pressure(C1) • Describe the short term regulation of arterial blood pressure(C2)	
Unit 5: RESPIRATORY SYSTEM		
Introduction to respiration	• Describe the functional anatomy of the respiratory system (C2)	6
Mechanics of respiration	• Mention the muscles of respiration(C1) • Describe the mechanism of inspiration and expiration(C2) • Describe the intra-pulmonary and intra-pleural	

Content	Competencies	Number of Hours
	pressure changes during the various phases of respiration(C2)	
Lung volumes and capacities	• Draw a labelled spirogram(C2) • Define various lung volumes and capacities (C1) • Mention the normal values of lung volumes and capacities (C1)	
Ventilation	• Define pulmonary ventilation (C1) • Mention the normal value of pulmonary ventilation (C1) • Define alveolar ventilation(C1) • Mention the normal value of alveolar ventilation(C1) • Define anatomical dead space (C1) • Mention the normal value of anatomical dead space (C1)	
Gas exchange	• Describe the structure of respiratory membrane (C2) • Mention the factors affecting diffusion of gases across it (C1)	
Transport of gases	• Mention the forms in which oxygen is transported in the blood(C1) • Describe the oxygen-hemoglobin dissociation curve(C2) • Mention the factors shifting the oxygen-hemoglobin dissociation curve to the right and to the left(C1) • Mention the forms in which carbon dioxide is transported in the blood(C1) • Describe the mechanism of carbon dioxide transport(C2)	
Regulation of respiration	• Explain the neural regulation of respiration(C2) • Explain the chemical regulation of respiration(C2)	
Applied aspects	• Define hypoxia(C1) • Mention the types of hypoxia with example (C1) • Define cyanosis(C1) • Mention the cause of cyanosis (C1) • Mention the types of hypoxia in which cyanosis occurs (C2) • Define apnea, dyspnea and asphyxia(C1)	
Unit 6: SPECIAL SENSES		
Vision	• Describe the structure of human eye with the help of a diagram (C2) • Mention the functions of aqueous humor (C1) • Name the photoreceptors (C1) • Mention the differences between the rods and cones (C1) • Draw the visual pathway (C2) • Explain the defects in field of vision due to lesions of visual pathway at different locations (C2) • Describe the mechanism of accommodation(C2) • Describe light reflex with the help of a diagram (C2) • Define visual acuity and mention the tests (C2)	4

Content	Competencies	Number of Hours
	• Describe the cause and correction for refractory errors of the eye(C2)	
Hearing and vestibular apparatus	• Describe the structure and functions of external, middle and inner ear (C2) • Describe the mechanism of hearing (C2) • Mention the parts and functions of vestibular apparatus (C1)	
Taste and smell	• Name the receptors for taste and smell (C1) • Mention the disorders of taste and smell (C1)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	33	99
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-
Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	-	-
Total	**33**	**99**

Assessment Methods:	
Formative:	**Summative:**
Unit Test - nil	Mid Semester/Sessional Exam (Theory)
Quiz - nil	End Semester Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x	x	x		
Sessional Examination 2	x	x	x	x		
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Basics of Medical Physiology,4th edition, D.Venkatesh, H.H.Sudhakar 2. Manipal Manual of Medical Physiology,1st edition, C. N. ChandraShekar
Additional References	**-**

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Basics of Exercise Therapy-I**
Course Code	**PTH1101**
Academic Year	First
Semester	I
Number of Credits	02
Course Prerequisite	Nil
Course Synopsis	This module is designed to provide the fundamental knowledge and principles of evaluation and exercises in Physiotherapy

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

CO1	Describe and relate starting and derived positions and their effects (C2)
CO2	Outline the principles and assessment procedure of vital signs, breath sounds and chest expansion (C3)
CO3	Outline the principles and methods of reflex testing and sensory examination (C2)
CO4	Outline the principles of limb length, limb girth, joint range of motion and muscle strength assessment (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Starting positions and derived positions	1. Define base of support, centre of gravity and line of gravity (C1) 2. Explain the types of equilibrium (C2) 3. Define, list and explain starting and derived positions(C2) 4. Explain the muscle work involved in adopting the starting and derived positions(C2) 5. Summarize the effects and uses of starting and derived positions(C2) 6. Describe pelvic tilt and its types (C2)	04
Unit 2:		
Breath sounds	1. Illustrate the surface landmarks for chest auscultation(C2) 2. Classify and explain breath sounds (C3)	02

Content	Competencies	Number of Hours
Unit 3:		
Chest Expansion	1. Describe measurement of chest expansion (C2) 2. Outline the indications, limitations and precautions for measurement of chest expansion(C2)	02
Unit 4		
Vital Signs	1. What are vital signs and the reference range(C1) 2. Explain the procedural steps for assessment of vital signs (C2)	02
Unit 5		
Sensory evaluation	1. Classify sensations (C2) 2. Outline sensory receptors and pathways(C2) 3. Explain the technique for evaluating superficial, deep and cortical sensations (C2)	04
Unit 6		
Reflex Testing	1. Illustrate the components of reflex arc (C2) 2. Outline the importance of reflex testing (C2) 3. Classify reflexes and explain the method and grading of superficial and deep reflexes (C2)	04
Unit 7		
Range of motion measurement	1. Define goniometry (C1) 2. Explain the principles of goniometry (C2) 3. List the various tools for measuring range of motion(C1) 4. Illustrate the surface anatomy pertaining to goniometry (C2) 5. Explain the technique for evaluation of joint range of motion (upper limb, lower limb and spine) (C2)	04
Unit 8		
Basics of Manual Muscle testing	1. Explain the principles and methods of manual muscle testing (C2) 2. Describe the grades of muscle strength (C2) 3. Outline advantages, disadvantages and limitations of manual muscle testing (C2)	02
Unit 9		
Limb Length and Limb girth measurement	1. Outline the indications limitations and precautions of limb length and limb girth measurement (C2) 2. Explain the procedural steps for the measurement of limb length and limb girth (C2)	02

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	10	20
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		

Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**46**

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			
Sessional Examination 2						
Presentations	x	x	x	x		
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3. 3. Hazel M Clarkson. Joint motion and function assessment –A research based practical guide. LWW; Spi Edition(2006) 4. Prasad K. Bickerstaff's Neurological Examination in clinical Practice. John Wiley;7th Edition (2013) 5. Sullivan, Physical Rehabilitation, F.A Davis; 7th edition(2019) 6. Cynthia C. Norkin. Measurement of Joint Motion: A guide to Goniometry. F A Davis; 5th edition(2016) 7. Kendall FP.et al. Muscles: Testing and Function, with Posture and Pain; Wolters Kluwer Health; 5 edition (December 1, 2014)
Additional References	1. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. 2. Avers D. Daniels and Worthingham's Muscle Testing. Elsevier; First edition (2018) **3.** Campbell. Dejong's Neurologic Examination; Wolters Kluwer India Pvt. Ltd.; Seventh edition (2012)

Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Basics of Exercise Therapy - I**
Course Code	**PTH1111**
Academic Year	First
Semester	I
Number of Credits	02
Course Prerequisite	Knowledge of Basics of Exercise Therapy-I
Course Synopsis	This module is designed to enable the students to apply the principles of evaluation and exercises in Physiotherapy and to perform basic evaluation skills required to implement an exercise therapy program

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

CO1	Display the basic etiquettes in addressing and discussing therapeutic exercise procedures(P2,A2)
CO2	Display starting positions and derived positions and relate their effects (C2, P3, A2)
CO3	Perform auscultation(breath sounds), measure and interpret vital signs and chest expansion (C2,P4, A2)
CO4	Perform reflex and sensory examination (C2,P4, A2)
CO5	Describe the principles and demonstrate the measurement of limb length, limb girth and joint range of motion (C2,P4,A2)

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:		
Starting positions and derived positions	1. Display starting and derived positions (P3, A2) 2. Relate the muscle work involved in adopting the starting and derived positions (C2)	06
Unit 2:		
Breath sounds	1. Perform auscultation and recognise normal and abnormal breath sounds (C2,P4, A2)	05
Unit 3:		
Chest Expansion	1. Measure chest expansion (C2,P4, A2)	02

Content	Competencies	Number of Hours
Unit 4		
Vital Signs	1. Perform the procedural skills for measuring vital signs and interpret deviations from the reference range (C2,P4, A2)	05
Unit 5		
Sensory evaluation	1. Display the procedure for evaluating superficial, deep and cortical sensations (C2,P4, A2)	08
Unit 6		
Reflex Testing	1. Perform the reflex assessment techniques(C2,P4, A2)	08
Unit 7		
Range of motion measurement	1. Perform the technique of evaluation of joint range of motion of upper limb, lower limb and spine (C2,P4, A2)	12
Unit 8		
Limb Length and Limb girth measurement	1. Measure limb length and limb girth (C2, P4, A2)	06

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	40	40
Revision	12	24
Assessment		
Total	**52**	**64**

Assessment Methods:	
Formative:	**Summative:**
OSCE/OSPE	Sessional Exam (Viva- voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester / Sessional Examination 1					
Sessional Examination 2	x	x	x	x	
Presentations					
End Semester Exam					

Feedback Process:	Sessional Examination 2 Feedback

Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3. 3. Hazel M Clarkson. Joint motion and function assessment – A research based practical guide. LWW; Spi Edition(2006) 4. Prasad K. Bickerstaff's Neurological Examination in clinical Practice. John Wiley;7th Edition (2013) 5. Sullivan, Physical Rehabilitation, F.A Davis; 7th edition(2019) 6. Cynthia C. Norkin. Measurement of Joint Motion: A guide to Goniometry. F A Davis; 5th edition(2016) 7. Kendall FP.et al. Muscles: Testing and Function, with Posture and Pain; Wolters Kluwer Health; 5 edition (December 1, 2014)
Additional References	1. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; (2017) 2. Avers D. Daniels and Worthingham's Muscle Testing. Elsevier; First edition (2018) **3.** Campbell. Dejong's Neurologic Examination; Wolters Kluwer India Pvt. Ltd.; Seventh edition (2012)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Biophysics and Basics of Electrotherapy**
Course Code	**PTH1102**
Academic Year	First
Semester	I
Number of Credits	03
Course Prerequisite	Nil
Course Synopsis	This module is designed to enable the students to apply the biophysical principles to understand human movement and statics and dynamics of human activities. It will also enable the students to understand the basic principles and laws governing electricity and electromagnetic spectrum and the effects of thermal agents.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the principles and laws of physics that govern human movement (C2)
CO2	Describe the properties of electricity (C2)
CO3	Explain the principles and laws governing electromagnetic induction and electromagnetic spectrum(C2)
CO4	Describe the various thermal agents and their effects (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Introduction to Biophysics	1. Classify and explain the types of motion (C2) 2. Define, classify and explain axes and planes with respect to human movement (C2) 3. Define kinematics and explain the kinematic variables to describe human motion (C2) 4. Define Kinetics and its related terms (Force Torque, Pendulum, Fixation and stabilization, Force, Velocity, Acceleration, Newton's laws of motion Work, Energy, Power, Inertia, Friction, Momentum) (C1) 5. Outline the principles of parallelogram of forces and illustrate the resolution of force component (C2)	13

Content	Competencies	Number of Hours
	6. Explain the types and ranges of muscle work(C2) 7. Define, classify and explain levers with examples from human body (C2) 8. Define and explain the application of angle of pull to improve muscle work (C2)	
Unit 2		
Static Electricity	1. Explain the characteristics of a charged body (C2) 2. Define electrostatic induction, electric field, electrical potential and capacity (C1) 3. List the properties of electric lines of force (C1) 4. List the factors affecting the capacity and potential of an object (C1) 5. Describe how static charges will be produced (C2)	02
Unit 3		
Current Electricity	1. Define Electromotive force, electrical resistance, Intensity of current, Ohms law, Joules law and volt (C1) 2. List the factors affecting the resistance and intensity of current (C1) 3. Describe the devices used for regulating the intensity of current (C2) 4. Explain the thermal effects of electric current (C2)	03
Unit 4		
Electric shock	1. Define and list the types of electric shock (C1) 2. Explain the causes and effects of electric shock (C2) 3. Explain the precautions to be taken to prevent electric shock(C2) 4. List the factors affecting the severity of electric shock (C1) 5. Describe the steps to be followed after a person encounters an electric shock (C2)	03
Unit 5		
Condenser	1. Define condensor, Farad, capacitative reactance (C1) 2. Explain the measurement and factors determining the capacity of a condenser (C2) 3. List the types of condensers (C1) 4. List the uses of condenser (C1) 5. Describe the methods of charging and discharging a condenser (C2)	02
Unit 6		
Electromagnetic Induction	1. Define electromagnetic induction, Faraday's law and Lenz's law (C1) 2. Explain the production of electromagnetic force and its properties (C2) 3. Define mutual induction, self-induction and	04

Content	Competencies	Number of Hours
	inductive reactance (C1) 4. Describe the properties of eddy currents (C2)	
Unit 7		
Electrical skin resistance and Types of Electrodes	1. Define skin resistance (C1) 2. List the factors affecting skin resistance(C1) 3. Explain the procedural methods to reduce skin resistance (C2) 4. Explain the types and functions of electrodes and electrode gels (C2)	02
Unit 8		
Electromagnetic spectrum	1. Define electromagnetic spectrum (C1) 2. Explain the laws governing electromagnetic radiation (C2) 3. Define Cosine law, Inverse square law, Grotthus law (C1)	02
Unit 9		
Pain Physiology	1. Define pain and classify pain (C2) 2. Describe the ascending and descending pathways of pain (C2) **3.** Explain pain modulation(C2)	02
Unit 10		
Therapeutic heat and cold	1. List and classify the various thermal agents used in rehabilitation (C1) 2. Explain the physiological and therapeutic effects of heat and cold (C2) 3. Explain the indications, contraindications and precautions of application of thermal agents (Moist Heat, Paraffin Wax Bath, Contrast Bath, Cryotherapy) (C2) 4. List the merits and demerits of thermal agents (C1)	06

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**72**

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	
Presentations		x	x	x	x
End Semester Exam		x	x	x	x
Feedback Process:	Mid-Semester Feedback				
	End-Semester Feedback				
Main Reference:	1. Forester and Palastanga. Clayton's Electrotherapy: Theory and Practice: 9/e; Bailliere Tindall 2. Scott PM. Clayton's Electrotherapy and Actinotherapy: 4/e; Bailliere, Tindall and Cox 3. Levangie PK, Norkin CC. Joint Structure & Function: A Comprehensive Analysis. F.A. Davis Company; 5 edition (March 9, 2011)				
Additional References	1. Reed A., Low J .Electrotherapy Explained: Principles and Practice, Butterworth-Heinemann				

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Foundations of Professional practice**
Course Code	**PTH1123**
Academic Year	First
Semester	I
Number of Credits	02
Course Prerequisite	Nil
Course Synopsis	This module is designed to enable the students to elaborate on professional behaviour for effective physiotherapy practice in an interdisciplinary setting. It will also prepare the student to deliver first aid and basic life support

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Discuss the professional behaviour in physiotherapy practice (C2)
CO2	Describe the characteristics of team work, lifelong learning, understand social responsibility and need for advocacy (C2, A2)
CO3	Demonstrate steps in first aid and Basic Life Support (C2, 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:		
Components of Professional behaviour	1. Enumerate the components of professional behaviour for Physiotherapist(C1) 2. Explain importance of developing professional behaviour (C2)	01
Unit 2:		
Professional accountability	1. List the levels of accountability (C1) 2. Explain the characteristics professional autonomy (C2) 3. Summarize Legal issues and scope of physiotherapy practice (C2)	01
Unit 3:		
Compassion and Altruism	1. Outline the importance of compassion and altruism (C2)	01
Unit 4		
Cultural competence	1. Summarize clients' values, preferences, beliefs in physiotherapy practice (C2)	01

Content	Competencies	Number of Hours
	2. Explain the inclusive practice (non-discriminative and non-oppressive interaction) among healthcare workers and clients (C2) 3. Explain the impact of health and social care policies on professional practice(C2)	
Unit 5		
Integrity	1. Describe Professional code of conduct (C2)	01
Unit 6		
Personal/professional development	1. Explain the importance and methods of professional and personal development (C2) 2. Describe the characteristics of a lifelong learner (C2, A2) 3. Explain the qualities of an effective professional (C2)	02
Unit 7		
Professional duty	1. Summarize the roles of a Physiotherapist as a professional (C2) 2. Summarize ways to contribute to the growth of profession (C2)	01
Unit 8		
Social responsibility and advocacy	1. Discuss the role of a physiotherapist in community engagement including social services (C2, A2) 2. Discuss the role of a physiotherapist in health and wellness needs of the society 3. Outline advocacy for profession in community service (C2, A2)	02
Unit 9		
Teamwork	1. Explain the principles of team building and inter professional practice (C2)	02
Unit 10		
Ethical behavior	1. Summarize the principles of ethics in professional practice (C2) 2. Outline principles and practice of client confidentiality (C2)	02
Unit 11		
First Aid	1. Explain the principles of first aid and approach to common injuries (Cuts, burns, trauma) (C2) 2. Display splinting, bandaging positioning and transfers(C2,P3,A3)	10
Unit 12		
Introduction to Basic Life support	1. Discuss the rationale for basic life support for the adult and children (including choking) (C2) 2. Perform techniques of basic life support on adults and children (C2,P4,A3)	15

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar		
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	05	05
Revision Practical	18	18
Assessment		
Total	**39**	**49**

Assessment Methods:	
Formative:	**Summative:**
OSCE, OSPE	Sessional Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1						
Sessional Examination 2	x	x				
Quiz / Viva						
Assignments/Presentations						
Clinical/Practical Log Book/ Record Book						
Any others: WPBA						
End Semester Exam						

Feedback Process:	Sessional Examination 2 Feedback
Main Reference:	1. Part 5: Adult Basic Life Support and Cardiopulmonary Resuscitation Quality: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2015 Nov 3;132(18 Suppl 2):S414-35. 2. First Aid Manual. St John's Ambulance. 3. WCPT (WORLD PHYSIOTHERAPY) guideline for physical therapist professional entry level education,2016

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Communication Skills**
Course Code	**CSK1001**
Academic Year	First
Semester	I
Number of Credits	02
Course Prerequisite	Nil
Course Synopsis	1. Equips the students with primary oral and written communication skills in English. 2. Orients students to focus on diverse interactive situations and enhances the interpersonal skills required in a professional environment.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Identify the components of communication skills and apply them in a professional setting (C3)
CO2	Outline effective oral communication skills in diverse context (C2)
CO3	Summarize different ways to write creatively, coherently and effectively on a given topic (C2)
CO4	Develop active listening skills involving feedback in diverse interactive situation. (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	

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Communication Skills	1. Define Communication (C1) 2. Outline the process and barriers in Communication (C2) 3. Explain the types of communication (C2) (Oral, Verbal, non-verbal, dyadic) 4. How to improve spoken skills (C1)(Telephone, face – to- face) 5. How to improve communication (C1) 6. Apply the concepts of communication skills in a professional setting (C3) 7. Identify the difference between formal and informal communication (C3)	6

Content	Competencies	Number of Hours
Unit 2:		
Reading Skills	1. Explain the types of reading (C2) (Oral, Silent, Extensive, Scanning, Skimming) 2. Outline the reading techniques (C2) (3Q3R) 3. What is the difference between scanning and skimming(C1) 4. Define source of information (C1) 5. Explain feedback on LSWR in individual presentation (C2) 6. Summarise the role played by prepositions in understanding what to read (C2)	4
Unit 3:		
Listening Skills	1. Explain the types of listening (C2) 2. Summarize the context and purpose of listening (C2) 3. Explain various types of listening obstacles (C2) 4. How to improve hearing and focused listening (C1) 5. What is facilitating understanding, static & process description-gambits (C1)	8
Unit 4:		
Writing skills	1. What is the difference between spoken and written form (C1) 2. How words are formed into phrases & clauses (C1) 3. Outline writing paragraphs, cohesion, coherence (C2) 4. Explain summary, precise and essay writing (C2) 5. How to write a formal and informal letters (C1) 6. How to write a resume /CV(C1) 7. Explain the role of visual aids and meetings in writing (C2) 8. Explain the importance of abbreviations and punctuations in writing(C2)	8

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

Learning Strategies	Contact Hours	Student Learning Time (SLT)
Lecture	26	78
Seminar	-	
Small group discussion (SGD)	-	
Self-directed learning (SDL)	-	
Problem Based Learning (PBL)	-	
Case Based Learning (CBL)	-	
Clinic	-	
Practical	-	
Revision	-	
Assessment	-	
Total	**26**	**78**

Assessment Methods:					
Formative:	**Summative:**				
Assignments	Mid Semester/Sessional Exam (Theory)				
Mapping of Assessment with COs:					
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**
Assignments		x	x	x	
Mid Semester / Sessional Examination		x	x	x	x
Feedback Process:	Mid-Semester Feedback				
	End-Semester Feedback				
Main Reference:	1. Jain, A K & et al., (2008-5th Edition). Professional Communication Skills, 2008, New Delhi, S Chand and Company 2. Raman, M., & Singh, P. (2012). Business communication. New Delhi: Oxford University Press				
Additional References	3. Raman, M & Sharma, S (2014). Technical communication: Principles and Practice. New Delhi: Oxford University				

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Environmental Science**
Course Code	**EIC1001**
Academic Year	First
Semester	I
Number of Credits	01
Course Prerequisite	Nil
Course Synopsis	1. Aim to give students a general understanding of environmental science and introduce them to some of the main principles 2. It covers the study of subjects for example understanding of earth procedures, evaluating alternative energy frameworks, mitigation and pollution control, natural resource management, effects of global climate change and so on

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the role of Environmental Science, its multidisciplinary nature in conservation of global environment (C2)
CO2	Describe the natural resources, utility and the role of ecosystems in maintaining planetary cycles (C2)
CO3	Outline the types, sources, prevention and control measures of pollution (C2)
CO4	List the laws, acts and policies related to environmental protection in India (C1)
CO5	Explain the types, mitigation and management techniques of disaster (C2)

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:		
Environmental Studies and multi-disciplinary nature	1. Explain the meaning, objectives and major environmental issues (C2) 2. What is sustainable development? (C1) 3. Explain the global environmental concerns (C2)	2
Unit 2:		
Biodiversity, Ecosystem, Energy and natural resources	1. Classify the natural resources (C2) 2. List the renewable and non- renewable resources (C1)	4

Content	Competencies	Number of Hours
	3. Outline the consumption of renewable and non-renewable resources 4. Explain the conservation methods of renewable and non-renewable resources 5. Outline the availability of water resources, forest, land and mineral resources. 6. Summarize the different types of energy (C2) (Conventional sources & Non-Conventional sources of energy, solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas, Fossil Fuels, Hydrogen as an alternative energy) 7. Define Ecosystem (C1) 8. Explain the meaning, structure and functions of ecosystem (C2) 9. Explain the biotic and abiotic components of ecosystem (C2) 10. Describe the trophic levels in ecosystem (C2) 11. What is an energy flow in an ecosystem (C1) 12. Explain Biodiversity and its conservation (C2) (in situ & ex situ, IUCN red list)	
Unit 3:		
Environmental Pollution	1. Explain the various types of Environmental Pollution (C2) (water, air, land, noise, solid waste, Biomedical waste, nuclear pollution, marine pollution)	2
Unit 4:		
Environmental laws and legislations	1. Outline the environmental laws and legislations (C2) (Related to general, air, water, biodiversity and forests) 2. Explain the roles and responsibilities of state and central Pollution control Boards (C2) 3. What is Environmental impact assessment (EIA) (C1)	2
Unit 5:		
Disaster management	1. Define disaster (C1) 2. What is disaster management? (C1) 3. Classify the types of disaster (C2) 4. What is disaster risk formula (C1) 5. Explain the phases in Disaster management phases (C2) (Disaster management cycle, Emergency response and recovery, Hazardous waste spills and dangers posed)	3

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	39
Seminar	-	
Small group discussion (SGD)	-	

Self-directed learning (SDL)	-	
Problem Based Learning (PBL)	-	
Case Based Learning (CBL)	-	
Clinic	-	
Practical	-	
Revision	-	
Assessment	-	
Total	**13**	**39**

Assessment Methods:	
Formative:	**Summative:**
Assignments	Mid Semester/Sessional Exam (Theory)

Mapping of Assessment with COs:

Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Assignments			x	x	x
Mid Semester / Sessional Examination	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Benny Joseph, Environmental Studies, Tata McGraw-Hill Publishing Company Ltd., New Delhi (2008). 2. Aloka Debi, "Environmental Science and Engineering", Universities Press (India) Pvt. Ltd. (2012).
Additional References	1. Mohan Kanda, Disaster Management in India evolution of institutional arrangements & operational strategies. (2017) 2. Student guide: Environment Reader for Universities, based on UGC syllabus published by Centre for Science and Environment, (2017). 3. G.Swarajya Lakshmi, Environmental science: A Practical Manual, (2010).

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Indian Constitution**
Course Code	**EIC1001**
Academic Year	First
Semester	I
Number of Credits	01
Course Prerequisite	Nil
Course Synopsis	1. To provide understanding of knowledge of the Indian constitution. 2. To familiarize students with the fundamental rights and duties. 3. To understand the importance of constitutional laws. 4. To understand the correlation between Indian constitution, democracy and society.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the salient features, importance and need of the Constitution (C2)
CO2	Infer the need of fundamental rights in a democratic system for a holistic development of a society (C2)
CO3	Outline the directions given to the state by the constitution and fundamental duties of a citizen towards the state (C2)
CO4	Explain the working nature of State and Centre, roles and responsibilities of President and Governors, amendments emergency powers enjoyed by the government (C2)
CO5	Explain various laws listed under IPC and CrPC and understand importance of voting in a democracy and RTI (C2)

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:		
Introduction to Indian Constitution	1. Outline the evolution of the Legal System (C1) (pre-colonial and colonial times, Common Law, Civil Law and Socialist Legal System) 2. Explain the constitutional history and constitutional assembly (C2) 3. Explain the various organs of the Government (C2) (Executive, Legislature and Judiciary, and	3

Content	Competencies	Number of Hours
	Panchayat institutions) 4. Summarise the functions of high court and supreme court of India (C2)	
Unit 2:		
Fundamental Rights	1. Explain the individual rights and fundamental rights (C2) 2. Outline the history of the demand for fundamental rights (C2) 3. Classify the fundamental rights (C2) 4. Explain how fundamental rights are a guarantee against state action (C2) 5. Summarise Article 14 to Article 30 (C2) 6. Explain supreme court as the guardian of Fundamental Rights (C2)	4
Unit 3:		
Fundamental Duties and Directive Principles of State Policy	1. Explain fundamental duties and its enforcement (C2) 2. Summarise the utility and the scope of DPSP(C2) 3. Outline the socialistic pattern of society (C2) 4. Explain the conflict between fundamental rights and DPSP (C2)	3
Unit 4:		
Role of President and Governors/ Cabinet	1. What is the procedure followed while electing a President (C1) 2. Explain the power and duties of the President (C2) 3. Outline the power and duties of the Governors (C2) 4. Explain the role and functions of the council of Ministers (C2)	2
Unit 5:		
Role of citizens, Constitutional laws(IPC and CrPC), RTI	1. Explain the role of citizens in a democracy (C2) 2. Explain constitutional laws (C2) 3. Explain the Indian Penal Code and Code of Criminal Procedure (C2) 4. Summarise right to Information (C2)	3

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

Learning Strategies	Contact Hours	Student Learning Time (SLT)
Lecture	15	45
Seminar	-	
Small group discussion (SGD)	-	
Self-directed learning (SDL)	-	
Problem Based Learning (PBL)	-	
Case Based Learning (CBL)	-	
Clinic	-	
Practical	-	

Revision		-				
Assessment		-				
Total		**15**		**45**		
Assessment Methods:						
Formative:	**Summative:**					
Assignments	Mid Semester/Sessional Exam (Theory)					
Mapping of Assessment with COs:						
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Assignments			x		x	x
Mid Semester / Sessional Examination		x	x	x		
Feedback Process:	Mid-Semester Feedback					
	End-Semester Feedback					
Main Reference:	1. Subhash C**.** Kashyap, Our Constitution, National Book Trust. (2011) 2. P. M. Bhakshi. The Constitutution of India. Universal Law Publishing.(2017)					
Additional References	1. Dr. B. R. Ambedkar. The Constitution of India. Educreation Publishing. (2020) 2. Bipan Chandra.History of Modern India. Orient BlackSwan. (2009) 3. Dr. Durga Das Basu. Introduction to the Constitution of India. Lexis Nexis.(2013)					

SEMESTER - II

COURSE CODE	:	COURSE TITLE
ANA1201	:	Anatomy - II
ANA1211	:	Anatomy Practical - II
PHY1201	:	Physiology - II
BIC1201	:	Biochemistry
PTH1201	:	Theoretical concepts in Basics of Exercise Therapy - II
PTH1211	:	Practical in Basics of Exercise Therapy - II
PTH1202	:	Theoretical concepts in Electrotherapy - I
PTH1212	:	Practical in Electrotherapy - I
PTH1203	:	Applied Anatomy and Applied Physiology

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Anatomy- II**
Course Code	**ANA1201**
Academic Year	First
Semester	II
Number of Credits	2
Course Prerequisite	Basic knowledge of general anatomy
Course Synopsis	Human anatomy is the study of the human body and relations of various structures of the body by dissection.
Course Outcomes (COs): At the end of the course student shall be able to	
CO1	Explain the musculoskeletal system related to the upper and lower extremities. (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours (Theory)**
Unit 1:		
Pectoral region and Axilla	• Describe the pectoral muscles –pectoralis major, pectoralis minor, serratus anterior with attachments, nerve supply and actions (C1, C2) • Explain anatomical basis of winging of scapula (C2) • Describe the clavipectoral fascia (C1) • Describe the boundaries and contents of axilla (C1, C2) • Describe the axillary artery- extent, course and branches (C1, C2) • Describe the brachial plexus formation and branches (C1, C2) • Describe the Erb's point mentioning the clinical aspects (C2) • Describe the Klumpke's paralysis (C2)	3
Muscles of back and shoulder region	• Describe the muscles of back and shoulder region- trapezius, deltoid, latissimus dorsi, rhomboidus major and minor, supraspinatus, infraspinatus, teres major and minor (detailed) C1, C2) • Describe the deltoid with applied anatomy (C1, C2) • Describe the supraspinatus with applied anatomy (C1, C2) • Describe the subacromial bursa with applied	2

Content	Competencies	Number of Hours (Theory)
	anatomy (C1, C2) • Describe the rotator cuff with its role in limiting shoulder dislocation (C1, C2) • Describe each of the intermuscular spaces with boundaries and contents (C1, C2)	
Arm	• Describe the muscles of front of arm- biceps brachii, brachialis, coracobrachialis with attachments, nerve supply and actions (C1, C2) • Describe the boundaries and contents of cubital fossa (C1, C2) • Describe the brachial artery with mention of Volkmann's ischemic contracture and supracondylar fracture (C1, C2) • Describe the axillary nerve with applied anatomy (C1, C2) • Describe musculocutaneous nerve with applied anatomy (C1, C2) • Describe the triceps brachii with the nerve supply & actions (C1, C2) • Describe radial nerve with applied anatomy (C1, C2)	2
Forearm	• Name the superficial and deep muscles of front of forearm with nerve supply and actions (C1, C2) • Describe pronator teres and brachioradialis in detail (C1, C2) • Names the muscles of back of forearm with nerve supply and actions (C1, C2) • Describe the supinator in detail (C1, C2) • Explains tennis elbow (C1, C2) • Describe the extensor retinaculum with osseo-fascial compartments in detail (C1) • Describe the anatomical snuff box with boundaries and contents (C1, C2)	2
Palm	• Describe the flexor retinaculum with applied anatomy (C1, C2) • briefly Describe the palm -name thenar and hypothenar muscles with nerve supply and action (C1) • Describe adductor pollicis (C1) • Describe the lumbricals and interossei (detailed) with nerve supply and actions (C1, C2)	1
Nerves and vessels of upper limb	• Describe the ulnar nerve with applied anatomy (C1, C2) • Describe the median nerve in detail (C1, C2) • Explains carpal tunnel syndrome detailed (C1, C2) • Describe each radial and ulnar artery- extent, course and branches (C1, C2)	3
Joints of upper limb	• Describe the shoulder joint under type, articular	3

Content	Competencies	Number of Hours (Theory)
	surfaces, ligaments, relations, movements and muscles responsible with a note on applied anatomy (C1, C2)Describe the elbow joint (detailed) (C1, C2) • Describe the radioulnar joints (detailed) (C1) • Describe the wrist joint (detailed) (C1, C2) • Describe the first carpometacarpal joint (detailed) (C1)	
Venous and lymphatic drainage of upper limb	• Describe the median cubital vein with applied anatomy (C1, C2) • Describe the cephalic vein with applied anatomy (C1, C2) • Describe the basilic vein with applied anatomy (C1, C2) • Describe the lymphatic drainage of upper limb (C1, C2)	1
Sternocleidomastoid and Muscles of facial expression	• Describe the sternocleidomastoid with attachments, relations, nerve supply, actions and applied anatomy (C1, C2) • Enumerates the muscles of facial expression (C1) • Describe the orbicularis oculi, orbicularis oris and buccinator with nerve supply and actions (C1, C2)	1
Vertebrae & Vertebral column	• Describe the curvatures of the vertebral column mentioning lordosis, kyphosis, scoliosis C1, (C2) • Explains the structure, functions, regional characteristics of vertebrae (C1, C2) • Describe the parts and function of intervertebral disc with applied anatomy (C1, C2)	1
Unit 2:		
Thigh	• Describe the fascia lata, iliotibial tract, saphenous opening (C1, C2) • Describe the boundaries and content of femoral triangle (C1, C2), • Describe the femoral sheath, femoral canal with applied anatomy (C1, C2) • Describe great saphenous vein (detailed) with applied anatomy (C1, C2) • Describe the femoral artery- extent, course and branches (C1, C2) • Describe the femoral nerve with applied anatomy (C1, C2) • Describe the inguinal lymph nodes (C1) • Describe the muscles of front of thigh with attachment, nerve supply and actions (C1, C2) • Describe the adductor canal -boundaries and content with applied anatomy (C1, C2) • Describe the adductor compartment muscles with attachment, nerve supply and actions (C1, C2)	3

Content	Competencies	Number of Hours (Theory)
	• Describe the adductor magnus with attachment, nerve supply and actions (C1, C2) • Describe the obturator nerve with applied anatomy (C1, C2)	
Gluteal region	• Describe the sensory innervation of the quadrants of gluteal region with a note on intramuscular injections (C1, C2) • Describe gluteus maximus with attachment, nerve supply and actions (C1, C2) • Describe the gluteus medius and minimus with actions and related applied anatomy (C1, C2) • Enumerate the structures under cover of gluteus maximus (C1) • Describe the relations of pyriformis with brief mention of attachment, nerve supply and actions (C1,C2)	1
Back of thigh and Popliteal fossa	• Describe the hamstring muscles with attachments, nerve supply and actions (C1, C2) • Describe the popliteal fossa with boundaries and contents (C1, C2) • Describe the popliteus with emphasis on actions (C1, C2) • Describe the popliteal artery -extent, course and branches with a note on applied anatomy (C1, C2)	1
Leg	• Enumerates the anterior compartment muscles with attachment, nerve supply and actions with applied anatomy (C1, C2) • Describe the tibialis anterior in detail with emphasis on actions (C1, C2) • Describe the anterior tibial artery –extent, course and branches (C1, C2) • Enumerates the lateral compartment muscles with attachment, nerve supply and actions with applied anatomy (C1, C2) • Describe the peroneal artery (C1, C2) • Enumerates the posterior compartment muscles with attachment, nerve supply and actions (C1, C2) • Describe the soleus in detail with a note on applied anatomy (C1, C2) • Describe the gastrocnemius in detail with a note on applied anatomy (C1, C2) • Describe the tibialis posterior in detail with emphasis on actions (C1, C2) • Describe the posterior tibial artery (C1, C2)	2
Foot	• Describe the sensory innervation of the dorsum of foot (C1, C2) • Enumerates the muscles with nerve supply (C1) • Describe the dorsalis pedis artery with reference	2

Content	Competencies	Number of Hours (Theory)
	to peripheral pulse (C1, C2) • Enumerates the muscles of first and second layer of sole (C1) • Names the sensory innervation of the sole of foot (C1) • Describe the arches of foot in detail with applied anatomy (C1, C2)	
Joints of lower limb	• Describe the hip joint under type, articular surfaces, ligaments, relations, movements and muscles responsible with a note on applied anatomy (C1, C2) • Describe the knee joint under – type, articular surfaces, ligaments, relations, movements and muscles responsible with a note on applied anatomy (C1, C2) • Describe the tibiofibular joint (detailed) (C1, C2) • Describe the ankle joint (detailed) (C1, C2) • Describe the subtalar joint (detailed) (C1)	3
Nerves of lower limb	• Describe the sciatic nerve under origin, root value, course, branches with applied anatomy (C1, C2) • Describe the tibial nerve under origin, root value, course, branches with applied anatomy (C1, C2) • Describe the common peroneal nerve under origin, root value, course, branches with applied anatomy (C1, C2) • Describe the deep peroneal nerve under course, branches and applied anatomy (C1, C2) • Describe the superficial peroneal nerve under course, branches and applied anatomy (C1, C2)	2
Venous and lymphatic drainage of lower limb	• Describe the great saphenous vein (detailed) with applied anatomy (C1, C2) • Describe the small saphenous vein (C1) • Describe the lymphatic drainage of lower limb with a mention of elephantiasis (C1, C2)	1

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	**34**	**102**
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Revision		
Assessment		
Total	**34**	**102**

Learning Assessment Methods:							
Formative:	**Summative:**						
Unit Test	Sessional Exam I and Sessional Exam II						
Quiz	End Semester Exam						
Viva							
Assignments/Presentations							
Mapping of Assessment with COs:							
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1		x					
Sessional Examination 2		x					
End Semester Exam		x					
Feedback Process:	Mid-Semester Feedback						
	End-Semester Feedback						
Main Reference:	• B D Chaurasia, Human Anatomy, Volume I & II. 8th edition, CBS Publishers. • Vishram Singh. General anatomy, 3rd ed. • Handbook of General anatomy by B.D. Chaurasia.						
Additional References	• Text book of Anatomy, Vishram singh, 3rd edition • Manipal Manual of Anatomy for allied health students by Dr. Sampath Madyastha.						

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Anatomy Practical- II**
Course Code	**ANA1211**
Academic Year	First
Semester	II
Number of Credits	2
Course Prerequisite	Basic knowledge of anatomy related to musculoskeletal system
Course Synopsis	Human anatomy is the study of gross features and relations of various structures of the body by dissection.
Course Outcomes (COs): At the end of the course student shall be able to:	
CO1	Demonstrate and explain the attachment of muscles, bones and related structures of the upper and lower extremities (C2; P1)

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

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1		**X**						

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Pectoral region and axilla	1. Identifies pectoralis major, -minor, and serratus anterior and states nerve supply of each (C2, P1) 2. Identifies the axillary vessels, cords and major branches of brachial plexus (C2, P1) 3. Identifies the trapezius, deltoid, latissimus dorsi, supraspinatus, infraspinatus, teres major and minor (C2, P1) 4. Identifies rhomboidus major and minor (C1, P1) 5. Identifies the intermuscular spaces and their contents (C2, P1)	3
Front and back of arm, cubital fossa,	1. Identifies the muscles of front and back of arm (C2, P1) 2. Identifies the boundaries and contents of cubital fossa (C2, P1)	2
Front and back of forearm and dorsum of hand	1. Identifies the muscles of front of forearm (C2, P1) 2. Identifies the muscles of back of forearm (C1, P1) 3. Identifies the extensor retinaculum (C2, P1) 4. Identifies the osseo-fascial compartments (C1, P1) 5. Identifies the anatomical snuff box with boundaries and contents (C2, P1)	2
Bones of upper limb	1. Demonstrates the major features and attachments of clavicle, scapula, Humerus (C2, P1) Demonstrates the major features and attachments of radius and ulna (C2, P1)	2

Content	Competencies	Number of Hours
	2. Identifies the carpals (C1, P1) 3. Identifies the carpals, metacarpals, phalanges and joints -MCP, DIP, PIP in the articulated hand (C1, P1)	
Palm of the hand	1. Identifies the thenar and hypothenar muscles (C1,P1) 2. Identifies the carpals (C1, P1) 3. Identifies the carpals, metacarpals, phalanges and joints -MCP, DIP, PIP in the articulated hand (C1, P1)	2
Blood vessels of upper limb	1. Identifies the axillary artery, brachial artery, radial artery, ulnar artery and superficial palmar arch (C2, P1) 2. Identifies the cephalic vein, basilic vein, axillary vein and median cubital vein (C2, P1)	2
Sternocleidomastoid Muscles of facial expression, Vertebrae	1. Identifies the sternocleidomastoid (C2, P1) 2. Identifies the orbicularis oculi, orbicularis oris (C2, P1) 3. Identifies cervical, thoracic, lumbar vertebrae and sacrum (C1, P1)	2
Unit 2:		
Hip bone Femur	1. Demonstrates the major features and attachments of hip bone and femur (C2, P1)	1
Front of thigh, femoral triangle, Adductor canal	1. Identifies the femoral triangle with its boundaries and contents (C2, P1) 2. Identifies the femoral artery, femoral vein, great saphenous vein, femoral nerve (C2, P1) 3. Identifies the sartorius, rectus femoris and vasti muscles (C2, P1) 4. Identifies the adductor canal with its boundaries and contents (C1, P1)	2
Medial side of thigh, Gluteal region,	1. Identifies the gracilis, adductor longus (C2, P1) and notices the other adductor muscles (C1, P1) 2. Identifies the gluteus maximus, gluteus medius, pyriformis (C2, P1) 3. Identifies the sciatic nerve, tibial nerve, common peroneal nerve (C2, P1)	2
Back of thigh, Popliteal fossa, Knee joint	1. Identifies the biceps femoris, adductor magnus, semitendinous, semimembranous, popliteus (C2, P1) 2. Identifies the popliteal vessels (C2, P1) 3. Identifies the medial and lateral meniscus, anterior cruciate ligament (C1, P1, P2)	3
Tibia, Patella, Fibula	1. Demonstrates the major features and attachments of tibia and Fibula (C2, P1) 2. Identifies the patella and names some attachments.	1
Leg	1. Identifies the flexor retinaculum, tibialis anterior, extensor hallucis longus, extensor digitorum longus and peroneus tertius along with their nerve supply (C2, P1) 2. Identifies the peroneus longus and peroneus brevis (C2, P1) and names their nerve supply (C1, C2, P1) 3. Identifies the gastrocnemius, soleus, Achilles	3

Content	Competencies	Number of Hours
	tendon, tibialis posterior	
Tarsal bones & articulated foot	1. Identifies the tarsals –calcaneus, talus, navicular, cuboid (C1, P1,) 2. Identifies the bones in a articulated foot	1
Sole & dorsum of foot	1. Identifies the extensor retinaculum and notices underlying structures (C2, P1) 2. Identifies the plantar aponeurosis, muscles of first and second layers of sole (C2, P1)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group demonstration (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical **(02 hours each)**	30	90
Revision	04	12
Assessment	03	09
Total	**37**	**111**

Assessment Methods:	
Formative:	**Summative:**
Table test	Mid Semester (Practical)
Spotters test	End Semester Exam (Practical)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid semester Sessional Examination 1	**x**		-	-	-	-
Table test	**x**					
Spotters test	**x**					
End Semester Exam	**x**					

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. B D Chaurasia, Human Anatomy, Volume I & II. 8th edition, CBS Publishers. 2. Vishram Singh. General anatomy, 3rd ed. 3. Handbook of General anatomy by B.D. Chaurasia.
Additional References	1. Text book of Anatomy, Vishram singh, 3rd edition 2. Manipal Manual of Anatomy for allied health students by Dr. Sampath Madyastha.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Physiology- II**
Course Code	**PHY1201**
Academic Year	First
Semester	II
Number of Credits	2
Course Prerequisite	Basic knowledge of general physiology
Course Synopsis	This module provides a comprehensive knowledge about normal functions of the organ systems of the body to understand the physiological basis of health and disease required for health professionals.

Course Outcomes (COs): At the end of the course student shall be able to:	
CO1	Know the basic facts and concepts of Physiology (C1).
CO2	To have a knowledge of the normal functions of organ systems of the body to facilitate an understanding of physiological basis of health (C2).
CO3	To integrate the functions of various organ systems & to understand their functions as a body unit (C2).
CO4	Explain the physiological basis of disease processes (C2).

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

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x							
CO3	x							
CO4	x							
CO5								
CO6								

Course Content and Outcomes:

Topics	**Competencies**	**Number of Hours**
Unit 1: Central nervous System		
General organization of nervous system	• Outline the organization of nervous system (C1) • Outline the organization of autonomic nervous system(ANS) C1) • Enumerate the functions of ANS (C1) • Mention the functional areas of cerebral cortex and their functions (C1)	1
Receptors	• Classify sensory receptors according to type and location of stimulus, giving examples for each (C2)	1

Topics	Competencies	Number of Hours
	• Explain the property of 'specificity' and 'adequate stimulus' (C2) • Explain the property of 'adaptation' of sensory receptors (C2)	
Synapse	• Define 'synapse' (C1) • Describe the structure of a synapse (C2) • Explain the events in synaptic transmission (C2)	1
Reflexes	• Define reflex (C1) • Enumerate the components of a reflex arc with the help of a diagram (C1) • Describe the stretch reflex with the help of a diagram(C2) • Describe withdrawal reflex with the help of a diagram(C2) • Explain the importance of withdrawal reflex (C2)	2
Ascending pathways	• Outline the general organization of sensory pathways(C1) • Describe the dorsal column, lateral spinothalamic and anterior spinothalamic tracts with the help of labelled diagrams(C2) • Mention the different sensations that are carried by the above pathways (C1)	2
Descending pathways	• Describe the pyramidal/corticospinal tract with the help of a labelled diagram (C2) • Tabulate the differences between 'upper motor neuron lesion' and 'lower motor neuron lesion (C2)	1
Cerebellum	• Name the functional divisions of cerebellum (C1) • Enumerate the functions of each lobe of cerebellum(C1) • List the clinical features of cerebellar lesion (C1) • List the clinical features of cerebellar lesion (C2)	1
Basal ganglia	• Mention the components of basal ganglia (C1) • Enumerate the functions of basal ganglia (C1) • Explain the cause and clinical features Parkinson's disease (C2) • Explain the basis of treatment of Parkinson's disease (C2)	1
Thalamus and Hypothalamus	• Explain the functions of thalamus (C2) • List the different nuclei of hypothalamus (C1) • Explain the functions of hypothalamus (C2)	2
Cerebrospinal fluid	• Describe the formation, circulation, absorption and functions of CSF (C2) • Mention the method of collection of a sample of CSF and its indications (C1) • Explain the functions of higher centers of brain(C2)	1

Topics	Competencies	Number of Hours
Unit 2: Gastrointestinal system		
Salivary secretion & Deglutition	• Mention the composition of saliva (C1) • Explain the functions of saliva (C2) • Describe the regulation of salivary secretion (C2) • Describe the effects of Xerostomia (C2) • Define deglutition (C1) • Explain the stages of deglutition (C2) • Describe dysphagia (C2) • Describe Achalasia cardia (C2)	1
Stomach	• Describe the functions of stomach (C2) • Mention the composition of gastric juice (C1) • Describe functions of gastric juice (C2) • Describe the mechanism of secretion of hydrochloric acid (C2) • Describe the regulation of gastric juice secretion(cephalic, gastric and intestinal phases) (C2)	1
Exocrine portion of Pancreas; Liver and biliary system	• Outline the composition of pancreatic juice (C1) • Describe the functions of pancreatic juice (C2) • Describe the neural and hormonal regulation of pancreatic juice (C2) • Outline the composition of hepatic bile(C1) • Describe the functions of bile(C2) • Enumerate the functions of gall bladder(C1)	1
Small intestine and large intestine	• Composition and functions of small intestinal secretions (C2) • Different types of Intestinal movements and their significance (C2) • Explain different types of small intestinal movements and their significance(C2) • List the functions of large intestine(C1)	1
Unit 3: Renal system		
Introduction & Glomerular filtration	• List the functions of kidneys (C1) • Draw a labelled diagram of a nephron (C1) • Mention the normal value of renal blood flow (C1) • Define glomerular filtration rate(GFR) (C1) • Mention the normal value of GFR (C1) • Explain the factors influencing GFR (C2) • List the substances used for the determination of GFR (C1)	1
Reabsorption and secretion in renal tubules	• Describe tubular reabsorption of sodium, glucose and water (C2) • Define tubular load, renal threshold and tubular/transport maximum (C1) • Mention the normal values for tubular load, renal threshold and tubular/transport maximum (C1)	1

Topics	Competencies	Number of Hours
Mechanism of concentration/dilution of urine	• Describe the role of counter current multiplier and counter current exchanger in the formation of urine (C2)	1
Physiology of micturition	• Describe the nerve supply to urinary bladder (C2) • Describe the micturition reflex (C2) • List the functions of skin	1
Unit 4: General principles of endocrinology		
Introduction and Pituitary gland	• Name the major endocrine glands and their secretions(C1) • Mention the chemical nature of hormones with examples (C2) • List the anterior pituitary hormones (C1) • Describe the actions of growth hormone (C2) • Describe the regulation of secretion of growth hormone(C2) • Describe the cause and clinical features of gigantism (C2) • Describe the cause and clinical features of acromegaly (C2) • Describe the cause and clinical features of dwarfism (C2) • List the hormones of posterior pituitary (C1) • Describe the actions of posterior pituitary hormones (C2) • Describe diabetes insipidus (C2)	1
Thyroid gland	• List the hormones of thyroid gland (C1) • Describe the actions of thyroid hormones(C2) • Describe the regulation of secretion of thyroid hormones (C2) • Describe the cause and clinical features of hyperthyroidism (C2) • Describe the cause and clinical features of cretinism (C2) • Describe the cause and clinical features of myxedema(C2) • Explain the actions of glucocorticoids (C2)	2
Adrenal cortex & Adrenal medulla	• Describe the regulation of secretion of glucocorticoids (C2) • Explain the cause and clinical features of Cushing's syndrome (C2) • Describe the actions of mineralocorticoids (C2) • Describe the cause and clinical features of Addison's disease (C2) • List the hormones of adrenal medulla (C1) • Describe the actions of adrenal medullary hormones (C2)	1
Parathyroid gland	• Describe the actions of PTH (C2)	1

Topics	Competencies	Number of Hours
	• Describe the regulation of secretion of PTH (C2) • Describe the effects of hyperparathyroidism (C2)	
Endocrine Pancreas	• Describe the actions of insulin (C2) • Describe the regulation of secretion of insulin (C2) • Describe the cause and clinical features of diabetes mellitus (C2) • List the actions of glucagon (C1) • Describe the regulation of secretion of glucagon (C2)	1
Unit 5: Reproductive system		
Male Reproductive system	• Describe the organization of male reproductive system(C2) • Describe the structure and functions of testes (C2) • Define spermatogenesis (C1) • Describe the stages of spermatogenesis (C2) • Mention the actions of testosterone (C1) • Describe the regulation of secretion of testosterone (C2)	1
Female Reproductive system	• Describe the structure of female reproductive system(C2) • Explain the actions of Estrogen and Progesterone (C2) • Describe the ovarian changes during menstrual cycle(C2) • Describe the uterine endometrial changes during menstrual cycle (C2) • Explain the hormonal control of ovarian functions (C2) • Describe the indicators of ovulation (C2)	2
Pregnancy and Lactation; Contraceptive methods	• Enumerate the functions of placenta (C1) • Describe milk ejection reflex (C2) • Mention various contraceptive methods in males (C1) • Mention various contraceptive methods in females (C1) • Explain the mechanism of action of various contraceptive methods (C2)	1

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	31	93
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**31**	**93**

Assessment Methods:	
Formative: Nil	**Summative:**
	Sessional Examination I and Sessional Examination II (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Sessional Examination 1	x	x				
Sessional Examination 2	x	x	x	x		
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Basics of Medical Physiology- 3rd Edition by D Venkatesh and HH Sudhaker 2. Manipal Manual of Medical Physiology,1st edition, C. N. ChandraShekar
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Biochemistry**
Course Code	**BIC1201**
Academic Year	First
Semester	II
Number of Credits	3
Course Prerequisite	Basic knowledge of Biology and Chemistry
Course Synopsis	Biochemistry broadly deals with the chemistry of life and living processes. It helps in understanding the building blocks – proteins, carbohydrates, fats, nucleic acids and is necessary for allied health professions students to understand various biochemical mechanisms so as to correlate with or identify the pathological processes. Knowledge of biomolecules is necessary to understand the various laboratory investigations and their relevance in clinical practice

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the classification, composition and functions of macromolecules (C2)
CO2	Describe the process of digestion, absorption and metabolism of carbohydrates, lipids and proteins (C2)
CO3	Summarize the concepts of nutrition, balanced diet and role of macro and micronutrients in the maintenance of health (C2)
CO4	Summarize the features and investigations in diabetes mellitus and acid-base disorders (C2)

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

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

Course Content and Outcomes:

Unit	**Content**	**Competencies**	**Number of Hours**
Unit 1: ENZYMES			
At the end of this chapter, a student should be able to 1. Define the term ‘enzyme’ (C1) 2. Classify enzymes based on reaction specificity (IUBMB classification) (C2) 3. Give one example (names of enzymes & reaction catalyzed) for each class of enzymes (C1) 4. Define the term ‘isoenzymes’ (C1) 5. Explain isoenzymes with examples (creatine kinase, lactate			2

Unit	Content	Competencies	Number of Hours
		dehydrogenase) (C2) 6. Define the term 'proenzyme or zymogen' with pepsinogen and trypsinogen as examples (C1) 7. Describe the utility of serum enzymes as diagnostic markers (C2) 8. Mention the diagnostic utility of following enzymes (C1) • CK • ALP • AST • ALT • LDH	
Unit 2: CARBOHYDRATE CHEMISTRY			
		At the end of this chapter, a student should be able to 1. Define the term 'carbohydrates' (C1) 2. Classify carbohydrates with examples for each class (C2) 3. Classify monosaccharides with examples based on (C2) • Number of carbon atoms • Functional groups 4. Mention the source and composition of following disaccharides (C1) • Sucrose • Lactose • Maltose 5. Classify polysaccharides based on composition with examples (C2) 6. Explain the structure of starch and glycogen with schematic representation (C2 7. List the differences between starch and glycogen (C1) 8. Mention the occurrence and functions of heparin and chondroitin sulphate (C1)	2
Unit 3: CARBOHYDRATE DIGESTION AND ABSORPTION			
		At the end of this chapter, a student should be able to 1. Describe the complete digestion of dietary polysaccharides (starch and glycogen) (C2) 2. Describe the reactions catalyzed by the following brush border enzymes (C2) • Maltase • Sucrase-isomaltase • Lactase 3. Illustrate the mechanisms of absorption of monosaccharides in the small intestine (C2) 4. Explain the significance of including sodium chloride along with glucose in the oral rehydration solution (C2)	2
Unit 4: CARBOHYDRATE METABOLISM			
		A. Glycolysis At the end of this chapter, a student should be able to 1. Define aerobic and anaerobic glycolysis (C1) 2. Mention the site and subcellular site of glycolysis (C1) 3. Describe the steps of glycolysis with all the enzymes and coenzymes at each step (C2) 4. Mention the regulatory enzymes and list the names of hormones that regulate it in the well-fed state and starvation (C1)	2

Unit	Content	Competencies	Number of Hours
5. Calculate the energetics of aerobic and anaerobic glycolysis (C2)			
B. Gluconeogenesis At the end of this chapter, a student should be able to 1. Define gluconeogenesis (C1) 2. Mention the sites & subcellular sites of gluconeogenesis (C1) 3. List the precursors for gluconeogenesis (C1) 4. List the key enzymes of gluconeogenesis (C1) 5. Describe the synthesis of glucose from pyruvate and lactate (C2) 6. Mention the regulatory enzymes and list the names of hormones that regulate it in the well-fed state and starvation (C1) 7. Explain the significance of gluconeogenesis (C2)			2
C. Citric acid cycle At the end of this chapter, a student should be able to 1. Recall the reaction catalyzed by pyruvate dehydrogenase complex and mention its coenzymes (C1) 2. Mention the site and subcellular site of citric acid cycle (C1) 3. Describe the reactions of citric acid cycle with all enzymes and coenzymes (C2) 4. Mention the regulatory enzymes of citric acid cycle (C1) 5. Calculate the energetics of citric acid cycle (C2)			2
D. Glycogen metabolism At the end of this chapter, a student should be able to 1. Mention the function of glycogen in liver and muscle (C1) 2. Define glycogenesis & glycogenolysis (C1) 3. Mention the site and subcellular site of glycogen metabolism (C1) 4. Mention the fate of end products of glycogenolysis in liver (role of glucose 6-phosphatase) and muscle (C1) 5. Mention the regulatory enzymes and the hormones involved in regulation in well-fed state and starvation (C1) **6.** List the glycogen storage disorders mentioning their names, defects and tissues affected (Type I, V & VI) (C1)			1
Unit 5: ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION			
At the end of this chapter, a student should be able to 1. Define the electron transport chain (ETC) (C1) 2. Name the subcellular site of ETC (C1) 3. Describe the complexes of ETC (with their components and order of arrangement) and mention the mobile electron carriers (C2) 4. Name the inhibitors for each of the complexes of ETC (C1) 5. Define oxidative phosphorylation (C1)			1
Unit 6: LIPID CHEMISTRY			
At the end of this chapter, a student should be able to 1. Define lipids (C1) 2. Explain the functions of lipids in the body (C2) 3. Classify lipids with examples for all the subclasses (C2) 4. Classify fatty acids with examples-saturated, unsaturated (based on number of double bonds), essential fatty acids (C2)			1
Unit 7: LIPID DIGESTION, ABSORPTION AND ASSOCIATED DISORDERS			
At the end of this chapter, a student should be able to 1. Explain the process of emulsification of lipids (C2)			2

Unit	Content	Competencies	Number of Hours
2. Describe the digestion of lipids in the stomach and intestine (C2) 3. Illustrate the process of absorption of lipids (C2) 4. Define steatorrhea and list its causes (C1)			
Unit 8: LIPID METABOLISM			
A. De novo synthesis of fatty acids At the end of this chapter, students should be able to 1. Mention the site and subcellular site of de novo synthesis of fatty acids (C1) 2. List the sources of acetyl CoA for de novo synthesis of fatty acids (C1) 3. Explain the reaction catalyzed by acetyl CoA carboxylase (C2) 4. Mention the regulatory enzyme and the hormones involved in regulation in well-fed state and starvation (C1) 1.			1
B. Synthesis of triacylglycerol (TAG) At the end of this chapter, students should be able to 1. Show the schematic structure of triacylglycerol (C1) 2. Mention the site and subcellular site of TAG synthesis (C1) 3. Describe the reactions of TAG synthesis (C2) 4. Mention the fate of TAG in liver and adipose tissue (C1)			1
C. Lipolysis At the end of this chapter, students should be able to 1. Mention the site and subcellular site of lipolysis (C1) 2. Describe the reactions of lipolysis (C2) 3. Mention the regulatory enzymes and the hormones involved in regulation in well-fed state and starvation (C1)			1
D. Beta oxidation of fatty acids At the end of this chapter, students should be able to 1. Define beta-oxidation (C1) 2. List the site and subcellular site of beta-oxidation (C1) 3. Describe the activation of palmitic acid (C2) 4. Explain the transport of activated palmitic acid into mitochondria (carnitine shuttle) (C2) 5. Describe the reactions of beta oxidation (C2) 6. Calculate the energetics of beta oxidation of palmitic acid (C2)			2
E. Lipoproteins At the end of this chapter, student should be able to 2. Classify lipoproteins based on their electrophoretic mobility and ultracentrifugation properties (C2) **3.** Mention the site of synthesis and the functions of Chylomicrons, VLDL, LDL and HDL (C1)			1
Unit 9: AMINO ACID & PROTEIN CHEMISTRY			
At the end of this chapter, student should be able to 1. Recognize the general structure of D and L amino acids (C1) 2. Classify amino acids based on the following with examples (C2) • Presence in proteins (standard and non-standard amino acids) • Metabolic fate (glucogenic and ketogenic amino acids) • Nutritional requirement (essential and non-essential amino acids) 3. Classify proteins based on composition, functions and shape with examples (C2)			3

Unit	Content	Competencies	Number of Hours
4. Describe the structure of mature collagen with diagram (C2) 5. Explain with illustrations the biosynthesis of mature collagen emphasizing the importance of prolyl hydroxylase, lysyl hydroxylase and lysyl oxidase (C2)			
Unit 10: PROTEIN DIGESTION AND ABSORPTION			
At the end of the chapter, a student should be able to 1. Outline the activation of zymogens in the GIT (C1) 2. List the endo and exopeptidases in the digestive juices (C1)			1
Unit 11: AMINO ACID METABOLISM			
At the end of the chapter, a student should be able to 1. Explain transamination of amino acids with suitable examples (C2) 2. Describe the generation of ammonia by oxidative deamination using L-glutamate dehydrogenase. (C2) 3. Study urea cycle as follows a. Name its site and subcellular site (C1) b. Describe its reactions (C2) c. Mention its significance (C1) 4. Recall the physiologically important products derived from the following amino acids (C1) a. Glycine b. Tyrosine c. Methionine d. Tryptophan			2
Unit 12: GENERAL CONCEPTS OF NUTRITION			
At the end of the chapter, a student should be able to 1. Define the term balanced diet (C1) 2. Define caloric value of food and list the caloric values of carbohydrates, proteins and fats (C1) 3. State the total daily caloric requirements of an adult male and female (for sedentary, moderate and heavy workers) and for pregnant and lactating women (C1) 4. Define recommended dietary allowance (RDA) (C1) 5. Study basal metabolic rate as follows a. Define (C1) b. List the normal values for men and women (C1) c. Explain the factors affecting BMR (C2) 6. Define thermic effect (SDA) of food and recall the values for macronutrients (C1)			2
Unit 13: CARBOHYDRATES, PROTEINS AND FATS IN NUTRITION			
A. Carbohydrates At the end of the chapter, a student should be able to 1. Mention the RDA (C1) 2. Study dietary fibers as follows a. Define (C1) b. Mention its RDA (C1) c. List the examples with their sources (C1) d. Explain its beneficial effects (C2)			2

Unit	Content	Competencies	Number of Hours
B. Proteins At the end of the chapter, a student should be able to 1. Mention the RDA (C1) 2. Define essential amino acids with examples (C1) 3. Study biological value as follows a. Define (C1) b. Name the protein used as standard for determining it (C1) c. List the protein sources with high and low biologic values (egg albumin, milk, fish, meat, rice, wheat and soy protein) (C1) 4. Define the term nitrogen balance (C1) 5. Explain positive and negative nitrogen balance with conditions during which they occur (C2) 6. Define the term limiting amino acids giving suitable examples (C1) 7. Explain mutual supplementation of proteins with examples (C2) **C. FATS** At the end of the chapter, a student should be able to 1. Mention the RDA (C1) 2. List the functions of cholesterol in the body (C1) 3. Study essential fatty acids as follows a. Define (C1) b. Mention its RDA (C1) c. Explain their functions and deficiency manifestations (C2) 4. Explain saturated and unsaturated (mono and poly) fatty acids with suitable examples, mentioning its sources and functions (C2)			
Unit 14: MINERALS			
At the end of this chapter, a student should be able to 1. Define the terms macro and micro minerals with examples. (C1) 2. Mention the sources and RDA for iron (C1) 3. Explain the functions, disorders of deficiency & excess for iron (C2) 4. Mention the sources, RDA and functions for calcium and phosphorus (C1) 5. Mention the normal serum levels of calcium and phosphorus and the hormones which regulate it **(**C1**)**			2
Unit 15: VITAMINS			
At the end of this chapter, a student should be able to 1. Define the term vitamins (C1) 2. List the classes of vitamins based on solubility (C1) 3. Study the water soluble vitamins mentioned below • Thiamine • Riboflavin • Niacin • Pantothenic acid • Pyridoxine • Biotin • Cobalamin • Folic acid • Ascorbic acid as follows ➢ List the RDA, sources and coenzyme forms (C1)			3

Unit	Content	Competencies	Number of Hours
➢ Describe the biochemical functions (C2) ➢ List the features of disorders associated with their deficiencies (C1) 4. Study the fat soluble vitamins A, D, E, K as follows ➢ List the RDA, sources and chemical forms. (C1) ➢ Describe the biochemical functions. (C2) ➢ List the features of disorders associated with their deficiencies and excess. (C1)			
16. MALNUTRITION			
At the end of this chapter, a student should be able to 1. Define the classes of protein energy malnutrition. (C1) 2. Compare the similarities and differences between marasmus and kwashiorkor (C2)			1
17. CLINICAL BIOCHEMISTRY			
A. GLUCOSE HOMEOSTASIS AND DIABETES MELLITUS At the end of this chapter, a student should be able to 1. Summarize the effect of the hormones involved in blood glucose homeostasis (C2) 2. Study diabetes mellitus as follows • Define (C1) • Classify and compare the types 1 and 2 (C2) • Mention the signs and symptoms (C1) • Mention the normal plasma levels of fasting, postprandial and random glucose & their utility in diagnosis (C1) • Explain the relevant investigations involved in the diagnosis and management (HbA_{1C}, procedure and interpretation of GTT, microalbuminuria) (C2) • Explain the biochemical basis for features of diabetic ketoacidosis (C2)			2
B. SIGNIFICANCE OF ESTIMATIONS OF VARIOUS BIOCHEMICAL PARAMETERS IN BLOOD At the end of this chapter, a student should be able to 1. Mention the normal serum levels of glucose, protein, urea, uric acid, bilirubin, cholesterol and creatinine and conditions in which they are altered **(**C1**)**			1
C. ACID BASE BALANCE AND DISTURBANCES At the end of this chapter, a student should be able to: 1. Define the terms acid, base, pH and pKa (C1) 2. Study buffers as follows • Define (C1) • Write the Henderson-Hasselbalch equation for different buffer systems (C1) • List the principal buffer systems in ECF, ICF and in urine (C1) • Mention the pKa value, normal ratio of base/acid in the plasma for bicarbonate and phosphate buffer systems (C1) 3. Study acid-base disorders as follows • Define the different classes (C1) • Explain the conditions causing acidosis & alkalosis (metabolic & respiratory) (C2)			1

Unit	Content	Competencies	Number of Hours
4. Mention the primary and compensatory changes in acid base disorders (C1)			
Unit 18: MOLECULAR BIOLOGY			
At the end of this chapter, a student should be able to 1. Name the purine and pyrimidine bases (C1) 2. Define nucleosides and nucleotides with examples (C1) 3. Illustrate the Watson and Crick model of B-DNA structure (C2) 4. List the different types of RNA (C1) 5. Recall the structural differences between DNA and RNA (C1) **6.** Define replication, transcription and translation (C1)			2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	45	135
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-
Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	4	16
Total	**49**	**151**

Assessment Methods:	
Formative:	**Summative:**
	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				
Sessional Examination 2	x	x	x	x		
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
Main Reference:	3. Essentials of Biochemistry, U satyanarayana, U Chakrapani (2nd edition) 4. Handbook of Biochemistry for Allied & Nursing Students, Shivananda Nayak B (2nd edition)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Basics of Exercise Therapy- II**
Course Code	**PTH1201**
Academic Year	First
Semester	II
Number of Credits	03
Course Prerequisite	Basic knowledge in Anatomy and Physiology
Course Synopsis	The course will enable the students to list the indications, contraindications, precautions, effects and uses of therapeutic exercise regimes. It will help students choose devices and equipment used for therapeutic exercise.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Outline the objectives, indications, contraindications, precautions, effects and uses of exercise therapy.(C2)
CO2	Explain the techniques and procedures used in exercise therapy (C2)
CO3	Identify devices and equipment used in exercise therapy. (C3)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to Movements	1. Define Movement (C1) 2. Relate mobility and immobility (C1) 3. List the types of movements. (C1) 4. Define passive, active-assisted and active movements (C1) · 5. List the indications and contraindications for passive, active-assisted and active movements (C2) 6. Explain the principles, effects and uses of passive, active-assisted and active movements. (C2).	08
Unit 2		
Relaxation	1. Define and classify relaxation. (C2) 2. Explain the physiological basis of relaxation. (C2) 3. Explain the principles of relaxation (C2) 4. Explain the methods of promoting local and general relaxation (C2)	03
Unit 3		
Breathing	1. List the types and outline the principles of breathing	05

Content	Competencies	Number of Hours
Exercises	exercises. (C2) 2. Summarize effects of breathing exercises. (C2) 3. List the indications and precautions for breathing exercises. (C2) 4. Explain the procedures of breathing exercises. (C2)	
Unit 4		
Therapeutic massage	1. Define and classify therapeutic massage (C2) 2. List indications and contraindications of therapeutic Massage. (C2) 3. Describe the techniques and explain the physiological and therapeutic effects (C2)	04
Unit 5		
Trick Movements	1. Define trick movements (C1) 2. Explain the types of trick movements (C2)	03
Unit 6		
Suspension therapy	1. Explain the types of suspension (C2) 2. Outline the components of the suspension unit. (C2) 3. List the indications and contraindications for suspension therapy (C2) 4. Explain the effects and uses for suspension therapy(C2) 5. Explain the techniques of suspension therapy. (C2)	04
Unit 7		
Postural Drainage	1. Define Postural Drainage (C1) 2. Explain the principles of Postural Drainage (C2) 3. List the techniques used in aiding the postural drainage (C1) 4. Summarize the procedure for postural drainage. (C2) 5. Explain the uses and list indications, contraindications and precautions of Postural Drainage (C2)	06
Unit 8		
Hydrotherapy	1. Outline the physical properties of water (C2) 2. Summarize the effects and uses of hydrotherapy. (C2) 3. Explain the types of hydrotherapy units, its merits and demerits (C2)	03
Unit 9		
Therapeutic Gymnasium	1. Identify the equipment and list its uses in therapeutic gymnasium (C3) 2. Explain the features of ideal therapeutic gym (C2)	03

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)		
Self-directed learning (SDL)	03	
Problem Based Learning (PBL)		

Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**72**

Assessment Methods:	
Formative:	**Summative:**
Presentations/ Unit test/ Quiz/Assignments	Mid Semester/Sessional Exam Theory
	End Semester Exam Theory

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x				
Assignments/ Presentations/ Quiz/ Unit test	x	x	x			
End Semester Exam	x	x	x			

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3. 3. Campion MR, editor. Hydrotherapy: principles and practice. Elsevier; 1997. 4. NCTMB M, Salvo SG. Massage Therapy: Principles and Practice, 5e.
Additional References	1. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Basics of Exercise therapy-II**
Course Code	**PTH1211**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy, Physiology and Theoretical concepts for Exercise therapy
Course Synopsis	This course will enable the students to choose devices and equipment used for therapeutic exercise. The student will be able to perform basic exercise therapy techniques in a safe environment.

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

CO1	Explain and perform the techniques and procedures used in exercise therapy (C2,P3, A1)
CO2	Identify equipment used in exercise therapy. (C3, P1)
CO3	Explain and perform manual muscle testing (P4)

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

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

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Passive Movements	1. Explain and demonstrate techniques of passive, active-assisted and active movements of spine and extremities. (C2,P3, A1)	12
Unit 2		
Relaxation	1. Explain and demonstrate the techniques of general relaxation (C2, P3, A1)	04
Unit 3		
Breathing exercises	1. Explain and demonstrate the techniques of breathing exercises (C2, P3, A1)	04
Unit 4		
Therapeutic Massage	1. Explain and demonstrate techniques of therapeutic massage (C2, P3, A1)	04
Unit 5		
Suspension therapy	1. Explain and demonstrate suspension therapy techniques. (C3, P3, A1)	08

Content	Competencies	Number of Hours
Unit 6		
Postural Drainage	1. Choose and demonstrate the techniques of Postural Drainage including chest tapotement techniques. (C2, P3, A1)	06
Unit 7		
Hydrotherapy	1. Demonstrate the techniques of hydrotherapy for extremities. (P3)	02
Unit 8		
Manual Muscle Testing	1. Recall the theoretical concepts of Manual Muscle Testing. (C1) 2. Explain and perform methods of manual muscle testing (C2, P4, A1)	12

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Practical	39	72
Revision/Practice	13	
Assessment		
Total	52	72

Assessment Methods:	
Formative:	**Summative:**
OSPE/OSCE	Sessional Examination 2 (Viva-voce and Practical)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Sessional Examination 2	x	x				
Quiz / Viva	x	x	x			
End Semester Exam						

Feedback Process:	Session examination 2 Feedback
Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3. Campion MR, editor. 3. Hydrotherapy: principles and practice. Elsevier; 1997. 4. 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 Sep 27. 5. NCTMB M, Salvo SG. Massage Therapy: Principles and Practice, 5e.
Additional References	1. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Electrotherapy -I**
Course Code	**PTH1202**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy and Physiology
Course Synopsis	The Module will enable the student to understand the use and application of high frequency electrotherapeutic modalities in Physiotherapy.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Outline indications, contra-indications, precautions, dangers and effects of high frequency electrotherapeutic modalities. (C2)
CO2	Explain the use and procedure for application of high frequency electrotherapeutic modalities. (C2)

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

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

Course Content and Outcomes

Content	Competencies	Number of Hours
Unit 1		
Introduction to Therapeutic current	1. Classify Therapeutic currents.(C2) 2. Explain the physics and principles of High, medium and low frequency currents (C2)	02
Unit 2		
Short wave diathermy	1. Explain the physiological and therapeutic effects of shortwave diathermy(C2) 2. Outline the indications, contraindications, precautions and dangers of shortwave diathermy (C2) 3. Explain the principles and methods of application of shortwave diathermy (C2) 4. List the modes of shortwave diathermy (C1) 5. Compare and contrast continuous and pulsed diathermy (C2)	05
Unit 3		
Microwave diathermy	1. Explain the physiological and therapeutic effects of microwave diathermy(C2) 2. Outline the indications, contraindications, precautions and dangers of microwave diathermy (C2)	02

Content	Competencies	Number of Hours
	3. Explain the principles and methods of application of microwave diathermy (C2)	
Unit 4		
Therapeutic Ultrasound	1. Explain the production and properties of Therapeutic ultrasound (C2) 2. Explain the physiologic and therapeutic effects of Therapeutic ultrasound (C2) 3. Outline the indications, contraindications, precautions and dangers of Therapeutic ultrasound (C2) 4. Explain the treatment parameters (frequency, mode, intensity and duration) and methods of application of Therapeutic ultrasound (C2) 5. Explain phonophoresis and its uses (C2)	05
Unit 5		
Ultraviolet radiation Therapy	1. Classify Ultraviolet radiation (C2) · 2. Explain the physiological and therapeutic effects of Ultraviolet radiation Therapy (C2) 3. Outline the indications, contraindications, precautions and dangers of ultraviolet radiation Therapy (C1) 4. Explain the dosage calculation and procedure of ultraviolet radiation Therapy (C2) 5. Explain the LEEDS and PUVA regime (C2)	04
Unit 6		
Infrared radiation	1. Explain the physiological and therapeutic effects of Infrared radiation therapy (C2) 2. Outline the indications, contraindications, precautions and dangers of Infrared radiation Therapy (C1) 3. Explain the dosage calculation and procedure of Infrared radiation Therapy (C2)	03
Unit 7		
Low Level LASER Therapy	1. List the types of low level LASER therapy (C1) 2. Explain the physiological and therapeutic effects of low level LASER therapy (C2) 3. List the indications and contraindications to low level LASER therapy (C1) 4. Explain the production, properties and uses of low level LASER therapy (C2) 5. Explain the dosage calculation and procedure of low level LASER therapy (C2)	03
Unit 8		
Extra corporeal shock wave therapy	1. Explain the physiological and therapeutic effects of extra corporeal shock wave therapy (C2) 2. Outline the indications and contraindications, of extra corporeal shock wave therapy. (C2) 3. Explain the principles and methods of application of Extra corporeal shock wave therapy (C2)	02

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	10	20
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Total	**26**	**46**

Assessment Methods:	
Formative:	**Summative:**
Unit Test, Assignments/Presentations	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x				
Assignments/Presentations	x	x				
End Semester Exam	x	x				

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Cameron, M.H., 2017. Physical Agents in Rehabilitation-E Book: An Evidence-Based Approach to Practice. Elsevier Health Sciences. 2. Forester and Palastanga. Clayton's Electrotherapy: Theory and Practice: 9/e; 3. Bailliere Tindall Scott PM. Clayton's Electrotherapy and Actinotherapy: 4/e;
Additional References	1. Reed A., Low J.Electrotherapy Explained: Principles and Practice, Butterworth-Heinemann Electrotherapy Explained, 4th Edition.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Electrotherapy-I**
Course Code	**PTH1212**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy, Physiology and Theoretical concepts for Electrotherapy
Course Synopsis	This course will help students to choose and demonstrate the procedure of high frequency electrotherapeutic modalities

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

CO1	Choose the high frequency electrotherapeutic modalities for clinical conditions. (C3)
CO2	Display the procedural steps for application of high frequency electrotherapeutic modalities (P3, A1)

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		
Short wave diathermy	1. Choose the method and display the procedural steps in the application of shortwave diathermy (C3, P3, A1)	14
Unit 2		
Therapeutic Ultrasound	1. Select and explain the treatment parameters for application of ultrasound in a given condition (C2, P1) 2. Display the procedural steps in the application of therapeutic ultrasound (C3, P3, A1)	14
Unit 3		
Ultraviolet Radiation Therapy	1. Explain and demonstrate the procedure and calculation of dosage for Ultraviolet radiation therapy (C2, P3, A1)	10
Unit 4		
Infrared Radiation Therapy	1. Explain and demonstrate the procedure for Infrared radiation therapy (C2, P3, A1)	10
Unit 5		
Low Level LASER Therapy	1. Explain and demonstrate procedure and dosage calculation for Low Level LASER Therapy (C2, P3, A1)	04

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	40	40
Revision/	12	
Assessment		
Total	**52**	**40**

Assessment Methods:	
Formative:	**Summative:**
OSPE/OSCE	Sessional Exam 2 (Viva-voce and Practical)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1						
Sessional Examination 2	x	x				
Assignments/Presentations						
End Semester Exam						

Feedback Process:	Sessional Examination
Main Reference:	1. Cameron, M.H., 2017. Physical Agents in Rehabilitation-E Book: An Evidence-Based Approach to Practice. Elsevier Health Sciences. 2. Forester and Palastanga. Clayton's Electrotherapy: Theory and Practice: 9/e; 3. Bailliere Tindall Scott PM. Clayton's Electrotherapy and Actinotherapy: 4/e;
Additional References	1. Reed A., Low J .Electrotherapy Explained: Principles and Practice, Butterworth-Heinemann Electrotherapy Explained, 4th Edition

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Applied Anatomy and Applied Physiology**
Course Code	**PTH1203**
Academic Year	First
Semester	II
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy and Physiology
Course Synopsis	This module will enable the student to apply anatomical and physiological knowledge and relate to disorders of human body.

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

CO1	Discuss the applied aspects of anatomy of major systems in human body (C2)
CO2	Describe the functions and applied physiology related to major systems in human body (C2)
CO3	Enlist the disorders associated with major systems in human body (C1)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Connective Tissue	1. Classify connective tissue (C1) 2. List the pathologies effecting connective tissues (C1) 3. Outline the basic structure of Nerve, muscle, ligament, tendon, bone and cartilage (C2) 4. Distinguish and compare the properties of specific connective tissue (C2)	03
Unit 2		
Classification of Joints	1. Recall joint structure(C1) 2. List the type of joints (C1) 3. Outline joint classification with examples (C2)	02
Respiratory system	1. Illustrate the upper and lower conducting airways (C2) 2. Define Bronchopulmonary segment and its significance (C2) 3. Define the anatomic and physiologic dead space and its significance(C1) 4. Explain the oxygen dissociation curve and its significance(C2)	04

Content	Competencies	Number of Hours
	5. Explain Ventilation to perfusion mismatch and its relevance to physiotherapy. (C2) 6. Outline chest wall movements (C2) 7. Explain the significance of breath sounds (C2) 8. List common disorders of the respiratory system (C2)	
Unit 3		
Cardiovascular system	1. List congenital and acquired disorders of the cardiovascular system (C1) 2. Explain the factors affecting the contractility of the heart (C2) 3. Describe heart sounds and its significance (C2)	03
Unit 4		
Nervous System	1. Recall the functions of central nervous system and list the disorders affecting cerebrum, cerebellum, brainstem, spinal cord and meninges (C2) 2. Illustrate Circle of Willis and explain its significance(C2) 3. Explain Blood brain barrier and its significance(C2) 4. Explain the factors affecting cerebral blood flow(C2) 5. Recall the CSF circulation and list the disorders (C1) 6. List the disorders of cranial nerves and spinal nerves (C1) 7. List the types of neuromuscular junction disorders(C1)	06
Unit 5		
Musculoskeletal system	1. Classify the types of bones (C1) 2. List the types of bones disorders (C1) 3. Classify muscles based on the functions (C1) 4. Explain the movement of joints in various axis and planes in the normal human locomotion. (C2) 5. List the conditions affecting ligament, tendon, bursa, Menisci and cartilage (C1) 6. List the types of muscle disorders(C1)	06
Unit 6		
Endocrine system	1. List the disorders endocrine (C1) 2. Relate the anatomical structure involved in endocrine disorders.	02

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar	13	26
Small group discussion (SGD)	10	20
Self-directed learning (SDL)	03	
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**46**

Assessment Methods:	
Formative:	**Summative:**
Unit Test / Quiz/ Assignments/ Presentations	Sessional Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1						
Sessional Examination 2	x	x	x			
Presentations/ Assignments	x	x	x			
End Semester Exam						

Feedback Process:	Sessional Examination 2 Feedback
Main Reference:	1) Chaurasia BD. Human anatomy. CBS Publisher; 2004. 2) Standring S, editor. Gray's anatomy e-book: the anatomical basis of clinical practice. Elsevier Health Sciences; 2015 Aug 7. 3) Sembulingam K, Sembulingam P. Essentials of medical physiology. JP Medical Ltd; 2012 Sep 30.

SEMESTER - III

COURSE CODE	:	COURSE TITLE
PAT2103	:	Pathology
MCB2102	:	Microbiology
PTH2101	:	Biomechanics
PTH2102	:	Theoretical concepts in Exercise therapy - I
PTH2111	:	Practical in Exercise therapy - I
PTH2103	:	Theoretical concepts in Electrotherapy - II
PTH2112	:	Practical in Electrotherapy - II
*** ****	:	Open elective - I

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Pathology**
Course Code	**PAT2103**
Academic Year	Second
Semester	III
Number of Credits	3
Course Prerequisite	Nil
Course Synopsis	This module is devoted to the structural and functional changes in cells, tissues and organs that underlie disease. Pathology examines diseases and their mechanisms including the what, when, where, why and how of disease. It forms an integral part of clinical medicine and allied streams, as it is required to understand the symptoms and signs of disease, the modes of diagnosis and the rationale for clinical care.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	To demonstrate their understanding of the basic principles of pathology both as a medical science and as a clinical discipline (C2)
CO2	To explain the disease mechanisms, which include basic concepts, inflammation and neoplasms of specific systems and organs, and haematological conditions and understand the significance of the mechanisms in the health profession education (C2)
CO3	To use the principles of laboratory tests in the diagnosis of diseases (C4)
CO4	To apply the knowledge of Pathology to clinical situations for understanding the disease process along with clinical manifestations and relate the relevance of knowledge of pathology to the practice of health profession (C4)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1: Basic concepts and general pathology		
Introduction to pathology & basic terminologies	**Terminologies** 1. Introduction to pathology 2. Recognise the relevance of Pathology (C2) 3. Define the basic terminologies and branches of Pathology (C1) a. Aaetiology b. Pathogenesis	1

Content	Competencies	Number of Hours
	c. Pathological and clinical manifestations d. Complications & sequelae e. Prognosis f. Syndrome g. Lesion 4. Explain the scope of the following branches of pathology: (C2) a) Histopathology b) Cytopathology c) Haematology	
Cell injury & adaptation	**Cell adaptation** Define cell growth, differentiation and cell adaptation (C1) Describe the various cell adaptations with examples (C2) a) Hypertrophy b) Hyperplasia c) Atrophy d) Metaplasia e) Dysplasia **Necrosis** 1. Define necrosis(C1) 2. Describe the various types of necrosis with clinical examples (C2) a) Coagulative necrosis b) Colliquative necrosis/ Liquefactive necrosis c) Caseous necrosis d) Fibrinoid necrosis e) Fat necrosis f) Gangrene	2
Inflammation	Define inflammation. List the types with examples. (C1) Acute inflammation 1. Define acute inflammation. (C1) 2. Describe the causes and cardinal signs of acute inflammation. (C2) 3. Explain the vascular of acute inflammation. (C2) 4. Describe the cellular events in acute inflammation. (C2) 5. Explain the sequelae of acute inflammation. (C2) 6. Explain the beneficial, harmful and systemic effects of acute inflammation. (C2) **Chronic inflammation** 1. Define chronic inflammation. (C1) 2. List the causes of chronic inflammation. (C1) 3. Describe the macroscopic and microscopic features in chronic inflammation. (C2) 4. List the cells in chronic inflammation. (C1) 5. Define granulomatous inflammation. (C2) 6. List the components of a granuloma and describe its morphology (C2) 7. List the causes of granulomatous inflammation. (C1)	3
Healing & repair	**Wound healing** 1. Define granulomation tissue and describe the	1

Content	Competencies	Number of Hours
	formation of granulation tissue. (C2) 2. Describe the following: (C2) a. Healing by first intention. b. Healing by second intention. c. Wound organization, contraction and scarring. 3. Explain the factors which modify (influence) healing and repair. (C2)	
Fluid & haemodynamic derangements	**Oedema** 1. Define oedema. (C1) 2. List the types of oedema. (C1) 3. Describe the pathogenesis and clinical features of the different types of oedema. (C2) **Shock** 1. Define shock. (C1) 2. List the various types of shock. (C1) 3. Describe the pathogenesis of septic and hypovolemic shock. (C2) **Thrombosis (Arterial & Venous)** 1. Define thrombosis. (C1) 2. Describe the factors influencing pathogenesis of thrombosis. (C2) 3. List causes of arterial and venous thrombosis. (C1) 4. List the fates of thrombus. (C1) **Embolism** 1. Define embolism. List the types of embolism with examples. (C1) 2. Describe the clinicopathologic consequences of pulmonary thromboembolism (C2) **Infarction** 1. Define infarction. (C1) 2. Describe the types and clinical significance of infarction. (C2)	4
Neoplasia	1. Define neoplasia (C1) 2. Describe the nomenclature of tumours with examples (C2) 3. Define dysplasia and anaplasia (C1) 4. Describe the differences between benign and malignant tumours (C2) 5. Define carcinogenesis. List the types of carcinogens with example of each (C1) 6. Describe the aetiology & predisposing factors of tumours (C2) 7. Define metastasis. (C1) 8. Describe the routes of metastasis with examples (C2) 9. Describe the prognostic factors of tumours with emphasis on staging & grading (C2) 10. Describe the various modalities for diagnosis of cancer (C2)	4
Infectious diseases	Tuberculosis 1. Describe the aaetiology and mode of transmission of tuberculosis (C2)	4

Content	Competencies	Number of Hours
	2. Describe the clinical features of tuberculosis. (C2) 3. Describe the morphology of primary, secondary and miliary tuberculosis. (C2) **Leprosy** 1. List the aetiological factors of leprosy (C1) 2. Classify leprosy (C1) 3. Describe the morphology of lepromatous and tuberculoid leprosy (C2)	
Genetics	1. Describe the basic concepts of genetics (C2) 2. Define with suitable examples (C1) a. Autosomal dominant b. Autosomal recessive c. X-linked recessive d. Chromosomal abnormalities 3. Define karyotyping (C1)	1
Unit 2: Haematology		
Diseases of RBCs	1. Define anaemia (C1) 2. Classify anaemia based on aaetiology and morphology (C4) 3. Describe the clinical features, aaetiology and basic investigation of (C2) a. Nutritional anaemias(B12/folate deficiency, iron deficiency) b. Haemolytic anaemias(thalassemia, sickle cell anaemia)	3
Bleeding disorders	1. List the types of bleeding disorders (C1) 2. Describe the clinical features and basic investigation of haemophilia (C2) 3. List the causes of thrombocytopenia (C1) 4. Describe the clinical features and basic investigation of immune thrombocytopenia (C2)	1
Diseases of WBC	1. Define leukemia (C1) 2. List the types of leukemia (C1) **Acute Leukaemia (AML, ALL)** 1. Describe the clinical features of AML & ALL. (C2) 2. Describe the laboratory diagnosis of AML and ALL (C2) **Chronic leukaemia (CML, CLL)** 1. Describe the clinical features, blood findings and chromosomal abnormality in CML (C2) 2. Describe the clinical features and laboratory diagnosis of CLL (C2)	2
Unit 3: Systemic Pathology		
Blood vessels & heart	**Hypertension** 1. Define hypertension (C1) 2. Classify hypertension (C4) 3. Describe the effects of hypertension on various organs (C2) **Atherosclerosis**	5

Content	Competencies	Number of Hours
	1. Define atherosclerosis (C1) 2. List the sites of involvement by atherosclerosis (C1) 3. Describe the predisposing factors, complications & clinical effects of atherosclerosis (C2) **Ischemic heart disease/Coronary artery disease** 1. Define ischemic heart disease (C1) 2. Describe the clinical spectrum of the disease (with reference to angina and myocardial infarction) (C2) **Aneurysm** 1. Define aneurysm (C1) 2. List the causes, types and complications of aneurysms (C1) **Rheumatic heart disease** 1. Define rheumatic heart disease (C1) 2. Describe its aaetiology & clinical features (C2) **Cardiac failure** 1. Define cardiac failure (C1) 2. List the causes of cardiac failure (C1) 3. Describe its pathophysiology & clinical features (C2)	
Respiratory system	**Pneumonia** 1. Define pneumonia (C1) 2. List the types of pneumonia(C1) 3. Describe the aetiology and clinical features of pneumonia (C2) **Chronic obstructive airway disease** 1. Define chronic obstructive airway disease. (C1) 2. List the types of chronic obstructive airway disease.(C1) **Emphysema** 1. Define emphysema(C1) 2. List the types of emphysema (C1) 3. Describe the aetiology and clinical features of emphysema (C2) **Chronic bronchitis** 1. Define chronic bronchitis (C1) 2. Describe the aetiology and clinical features of chronic bronchitis (C2) **Bronchiectasis** 1. Define bronchiectasis (C1) 2. List the types of bronchiectasis. (C1) 3. Describe the aetiology and clinical features of bronchiectasis (C2) **Asthma** 1. Define asthma (C1) 2. List the types of asthma (C1) 3. Describe the aetiology and clinical features of asthma (C2) **Pneumoconiosis** 1. Define pneumoconiosis (C1) 2. List the types of pneumoconiosis (C1)	4

Content	Competencies	Number of Hours
	3. Describe the aetiology and clinical features of pneumoconiosis (C2)	
Gastrointestinal tract & liver	**Gastric & duodenal ulcers** 1. Definition gastric and duodenal ulcer (C1) 2. Describe the aetiology, gross pathology and clinical features of gastric and duodenal ulcer (C2) **GIT malignancies** 1. List the types of common GIT malignancies (C1) 2. Describe their predisposing factors & clinical features (C2) **Jaundice** 1. Define jaundice (C1) 2. List the types of jaundice with examples (C1) **Viral hepatitis** 1. Describe the aetiology of viral hepatitis (C2) 2. List the modes of infection (C1) 3. Describe the clinical features of viral hepatitis (C2) **Cirrhosis of liver** 1. Define cirrhosis (C1) 2. List the causes of cirrhosis (C1) **Liver failure** 1. Define liver failure (C1) 2. List the causes of liver failure (C1) 3. Describe its pathophysiology & clinical features (C2)	4
Renal system	Define nephrotic syndrome & nephritic syndrome with suitable examples (C1) **Renal failure** 1. Define renal failure (C1) 2. List its types & describe the clinical features (C2)	1
Endocrine system	1. Define hyperthyroidism & hypothyroidism (C1) 2. Describe the causes, clinical features and laboratory diagnosis of hyperthyroidism and hypothyroidism (C2) 3. Describe the types, causes & clinical features of goitre (C2) Describe types, clinical features, complications & laboratory diagnosis of diabetes (C2)	2
Nervous system	Define Cerebrovascular diseases (C1) Describe its causes and clinical features (C2)	1
Musculoskeletal system	**Fracture** 1. Define fracture (C1) 2. List the types of fracture (C1) 3. Describe the process of fracture healing (C2) 4. List the factors influencing fracture repair (C1) **Osteomyelitis** 1. Define osteomyelitis (C1) 2. Describe the aetiology, types and clinical features of osteomyelitis (C2) Define and list the clinical features of Rheumatoid arthritis, osteoarthritis and osteoporosis (C1)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	45	135
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-
Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	-	-
Total	**45**	**135**

Assessment Methods:	
Formative:	**Summative:**
Unit Test - Nil	1st Sessional Exam - SEQ (theory) 2nd sessional exam - MTF (theory)
Quiz - Nil	University exam – SEQ (theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester /SessionalExamination 1	x	x	x	x		
Sessional Examination 2	x	x	x	x		
End Semester/University Exam	x	x	x	x		

Feedback Process:	Mid semester feedback End-Semester Feedback
Main Reference:	1. Essential Pathology for Dental students, Harsh Mohan, 3rd edition, 2010 Jaypee. 2. General and systemic pathology, JCE Underwood and S S Cross, 7th edition, 2018, Churchill Livingstone.
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Microbiology**
Course Code	**MCB2102**
Academic Year	Second
Semester	III
Number of Credits	2
Course Prerequisite	NIL
Course Synopsis	This course focuses on acquiring the knowledge pertaining to basics of medical microbiology, host immune response, healthcare associated infections and aseptic measures to prevent infections

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

CO1	Explain the process of disease causation by infectious agents and appraise the role of microbiology laboratory in the diagnosis, management and control of infectious diseases (C2)
CO2	Explain the development of immune response, its relation to infection and other diseases with an immunological basis (C2)
CO3	Explain the implications of antibiotic susceptibility (C2)
CO4	Understanding the principles of asepsis and infection control in clinical practice (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Introduction to medical microbiology	i) Historical introduction to microbiology a. Describe the contributions of: (C1) • Louis Pasteur • Robert Koch ii) Classify the microorganisms (C2) iii) List the branches of microbiology and their significance (C1)	1
Bacterial anatomy and classification	i) Explain the bacterial cell structure, organelles and their functions (C2) ii) Explain the bacterial envelope of gram positive and gram negative bacteria (C2) iii) Explain the following bacterial structure and their	2

Content	Competencies	Number of Hours
	significance (C2) a. Cytoplasm b. Ribosomes c. Mesosomes d. Nucleoid e. Inclusion granules f. Flagella g. Pili h. Capsule i. Plasmid j. Spores iv) Classify bacteria based on morphology and nutrition (C2)	
Growth, cultivation and identification of bacteria	i) Explain the following: (C2) a. Bacterial growth curve b. Cultivation of bacteria • Culture media • Culture methods c. Identification of bacteria • Microscopy and Staining techniques • Biochemical reactions • Serology • Molecular techniques	2
Antimicrobial susceptibility	i) Explain the disc diffusion methods – Kirby Bauer's and E - test (C2)	1
Introduction to virology, mycology & parasitology	i) Explain the following: (C2) a. General features of viruses b. Virion structure c. Classification of viruses d. Diagnosis of viral diseases e. General properties and classification of fungi (morphological classification) f. Infections produced by fungi and their diagnosis g. General properties and classification of parasites h. Parasitic infections and their diagnosis	3
Sterilization and disinfection	i) Classify sterilization methods (C2) ii) Explain the following (C2) a. Physical: Heat b. Sterilization by heat c. Dry heat sterilization – • Hot air oven and incinerator d. Moist heat sterilization • Below 100 ^{o}C, • At 100 ^{o}C • Above 100 ^{o}C e. Classification of disinfectants used in hospital and their mechanism of action	3

Content	Competencies	Number of Hours
Infection & immunity	i) Define infection (C1) a. List the types, sources, routes and spread of infectious diseases (C1) ii) Define and classify immunity (C1) iii) Explain the following: (C2) a. Types of immunity b. Types of vaccines iv) List the immunization schedule in India (C1)	2
Antigen & antibody	i) Define antigen (C1) ii) Define(C1) and classify antibodies (C2) iii) Explain the following (C2) a. Functions of antibodies b. Diagnostic importance of antigen-antibody reactions • Agglutination • Immunofluorescence • ELISA	1
Immune response	i) List the cells of immune system (C1) ii) Explain the following: (C2) a. Humoral Immunity - Primary and secondary immune response b. Cell mediated Immunity -Constituents and significance	2
Hypersensitivity	i) Define (C1) and classify hypersensitivity (C2) Explain the following: (C2) a. Immediate hypersensitivity • Mechanisms and mediators of Anaphylaxis and atopy b. Cytotoxic hypersensitivity - Mechanism and associated disorders c. Immune complex hypersensitivity- • Arthus reaction, serum sickness and immune complex diseases d. Delayed type hypersensitivity- Mechanism and clinical importance of • Contact dermatitis and tuberculin type hypersensitivity	2
Autoimmunity	i) Define autoimmunity (C1) ii) Explain the mechanisms of autoimmunity (C2) iii) List the diseases involving predominantly one type of cell or organs (C1) iv) List the diseases involving multiple organs (systemic) (C1)	1
Healthcare associated infections	i) List the common Healthcare associated infections (C1) ii) Explain the following: (C2) a. Causes b. Sources c. Routes of spread	1

Content	Competencies	Number of Hours
	d. Host risk factors e. MRSA and its importance **f.** Prevention **g.** Investigation	
Standard Precautions And Overview Of Laboratory Diagnosis Of Microbial Infections	i) Explain the following (C2) **a.** Hand hygiene **b.** Personal protective equipment (PPE) **c.** Respiratory hygiene **d.** Sharp safety **e.** Sterile instruments and devices. **f.** Clean and disinfected environmental surfaces ii) Explain laboratory diagnosis of microbial infections (C2) a. Specimen Collection b. Specimen transport c. Specimen processing and handling d. Identification of microbes	3

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	24	72
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision	2	6
Assessment	4	12
Total	**30**	**90**

Assessment Methods:	
Formative:	**Summative:**
Unit Test- Nil	Mid Semester- First Sessional Examination SEQ (theory) Second Sessional Examination – MTF (theory)
Quiz - Nil	University Examination – SEQ theory

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x	x	x	-	-
Sessional Examination 2	x	x	x	x	-	-
End Semester / University Exam	x	x	x	x	-	-

Feedback Process:	Mid-Semester Feedback

	End-Semester Feedback
Main Reference:	1. Textbook of Microbiology for Dental students, Prof: C.P. Baweja 2. Medical Parasitology, D. R. Arora and D. Arora
Additional References	Review of Medical Microbiology and Immunology by Warren Levinson, 15th Edition

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Biomechanics**
Course Code	**PTH2101**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Basic knowledge in Anatomy
Course Synopsis	This module is designed – To apply the basic principles of biophysics in describing the structural integrity and functions of human musculoskeletal system.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Summarize human movements using the concepts of kinematics and kinetics (C2)
CO2	Explain the principles of biomechanics in describing and analysing common functional activities and recognize altered movement patterns (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Biomechanics of the Shoulder complex	1. List the components of shoulder complex (C1) 2. Explain the integrated function of the shoulder complex in terms of kinematics and kinetics (C2)	04
Unit 2:		
Biomechanics of the Elbow and forearm complex	1. Recall the structure of the elbow and forearm complex (C1) 2. Explain kinematics and kinetics of the elbow complex (C2) 3. Explain kinematics and kinetics of the forearm(C2)	02
Unit 3:		
Biomechanics of Wrist and hand complex	1. Recall the structure of wrist and hand complex(C1) 2. Explain kinematics and kinetics of the wrist and hand complex(C2) 3. List the types of grip(C1) 4. Explain prehensile function of the hand (C2)	03

Content	Competencies	Number of Hours
Unit 4:		
Biomechanics of Hip complex	1. Recall the structure and outline structural deviations of the hip complex (C1) 2. Explain kinematics of the hip complex (C2) 3. Summarize kinetics of hip complex and apply hip joint forces and muscle function in stance (C2)	03
Unit 5:		
Biomechanics of Knee complex	1. Recall the structure and outline the structural deviations of patella and tibiofemoral joint (C1) 2. Explain the kinematics and kinetics of the tibiofemoral and patellofemoral joints (C2) 3. Summarize the effects of injury and disease on tibiofemoral and patellofemoral joints(C2)	04
Unit 6:		
Biomechanics of Ankle and Foot complex	1. Recall the structures of the ankle, subtalar, transverse tarsal, tarso-metatarsal and metatarsophalangeal and interphalangeal joints (C1) 2. Explain the structure, function and muscular contributions to the plantar arches (C2) 3. Explain the kinematics and kinetics of the ankle and foot complex(C2)	04
Unit 7:		
Biomechanics of axial skeleton joint complexes (spine and chest wall)	1. Recall the structure of the axial skeleton (C1) 2. Explain the kinematics and kinetics of cervical region, thoracic region, lumbopelvic region (C2) 3. List the muscles of craniocervical, upper thoracic, lower thoracic lumbopelvic and pelvic floor regions (C1) 4. Recall the structure and muscles associated with ribcage (C1) 5. Explain the coordination and integration of ventilatory motions (C2)	10
Unit 8:		
Biomechanics of temporomandibular joint	1. Explain the structure of temporomandibular joints (C2) 2. Explain the kinematics of mandibular motions and relate with movements of cervical spine (C2)	02
Unit 9:		
Biomechanics of Gait	1. Define gait (C1) 2. Outline terminologies used in gait (C2) 3. Explain the gait cycle (C2) 4. List and explain the determinants of gait (C2) 5. Explain the kinematics and kinetics of gait (C2)	04

Content	Competencies	Number of Hours
Unit 10:		
Applied biomechanics of common functional activities	1. Interpret and describe kinematics and kinetics of throwing , squatting, stair climbing and running (C2)	03

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	**3**	**6**
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**78**

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

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Levangie, Pamela K, and Cynthia C. Norkin. Joint Structure and Function: A Comprehensive Analysis. Philadelphia, PA: F.A. Davis Co, 2005 2. Nordin, Margareta, and Victor H. Frankel. Basic Biomechanics of the Musculoskeletal System. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins, 2012
Additional References	1. Physiology of joints - Kapandji Vol 1,2,&3 (upper limb ,lower limb and trunk) Churchill Livingstone 2. Neumann, Donald A. Kinesiology Of the Musculoskeletal System: Foundations for Physical Rehabilitation. St. Louis :Mosby, 2002

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Exercise therapy - I**
Course Code	**PTH2102**
Academic Year	Second
Semester	III
Number of Credits	03
Course Prerequisite	Basic knowledge in anatomy and physiology.
Course Synopsis	This module is designed to– Enable the student to understand the uses and procedural steps in delivering therapeutic exercise techniques for improving flexibility and strength.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Outline indications, contra-indications and precautions for therapeutic exercise (C2)
CO2	Utilize the principles and procedural steps (including home program) in the implementation of flexibility, joint mobility and strength (C3)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Home program	1. Explain the principles of home program (C2) 2. Explain merits and demerits of home program (C2) 3. Explain methods to deliver and monitor home program (C2)	04
Unit 2:		
Stretching	1. Define flexibility and stretching (C1) 2. Classify stretching (C2) 3. Explain the physiological basis for stretching techniques (C2) 4. Explain the effects and uses of stretching (C2) 5. Summarize the indications, contraindications and precautions for stretching(C2) 6. Explain the principles and determinants for stretching techniques (C2) 7. Explain the adjuncts for stretching (C2)	09
Unit 3:		
Joint Mobilization	1. Recall the arthrokinematics of peripheral joints and methods to assess joint ROM (C1) 2. Define and classify joint mobilization (C2)	06

Content	Competencies	Number of Hours
	3. Explain the principles and grades of mobilization (C2) 4. Explain indications, contraindications and precautions of Mobilization (C2) 5. Summarize physiological and therapeutic effects of mobilization (C2)	
Unit 4:		
Muscle Strengthening	1. Recall classification of muscle fibres, types and ranges of muscle work (C1) 2. Define strength, power and endurance (C1) 3. Explain the principles of resistance training (C2). 4. Explain the determinants of tension generation in normal skeletal muscle (C2) 5. Summarize physiological adaptations to resistance training(C2) 6. Explain the determinants of resistance training (C2) 7. Recall grades of manual muscle testing and explain muscle re-education and progressive resistance training (C2) 8. Explain weight bearing and non- weight bearing exercises (C2) 9. Outline the concept of periodization (C2) 10. List the contraindications and precautions for strength training. (C2)	12
Unit 5:		
Spinal traction	1. Define and classify traction (C1) 2. Explain modes of traction (C2) 3. Explain indications, contraindication, effects and uses of spinal traction(C2)	06
Unit 6:		
Group Exercises	1. Explain the principles of group exercises (C2) 2. Explain merits and demerits of group exercises (C2) 3. Choose and conduct appropriate group exercise program. (C3) 4. Explain advantages and disadvantages of group exercises. (C2) 5. Compare and contrast mass exercise and group exercise(C2)	02

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	**3**	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		

Practical		
Revision		
Assessment		
Total	**39**	**72**

Assessment Methods:	
Formative:	**Summative:**
Presentations	Mid Semester/Sessional Exam
	End Semester Exam

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18. 2. Gardiner MD. The principles of exercise therapy. Bell; 1957. 3. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3.
Additional References	1. Kendall, Florence P, and Florence P. Kendall. Muscles: Testing and Function with Posture and Pain. Baltimore, MD: Lippincott Williams & Wilkins, 2005 2. Avers D. Daniels and Worthingham's Muscle Testing. Elsevier; First edition (2018)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Exercise therapy - I**
Course Code	**PTH2111**
Academic Year	Second
Semester	III
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy, Physiology and Theoretical concepts for Exercise therapy
Course Synopsis	This module will enable the student to develop skills necessary for planning and executing therapeutic exercises for improving flexibility and strength.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Display the basic etiquettes in addressing clients and discussing therapeutic exercise procedures (P2, A2)
CO2	Utilize the principles, follow procedural steps (including home program) and perform the techniques to improve flexibility, joint mobility and strength (C3,P4,A2)

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:		
Stretching	1. Follow the procedural steps and perform stretching techniques (C2, P4, A2)	12
Unit 2:		
Joint Mobilization	1. Follow the procedural steps and perform grades of peripheral joint mobilization (C2, P4, A2)	12
Unit 3:		
Muscle Strengthening	1. Select and perform muscle re-education techniques (C3, P4, A2) 2. Select methods and equipment for progressive resistance training (C3,P4,A2)	24
Unit 4:		
Spinal traction	1. Choose the mode and the parameters to apply spinal traction (C3, P4, A2) 2. Follow the procedural steps and perform manual and positional traction (C2, P4, A2)	04

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	40	40
Revision	12	
Assessment		
Total	**52**	**40**

Assessment Methods:	
Formative:	**Summative:**
OSPE/OSCE	Sessional Exam (Viva-voce an Practical)

Mapping of Assessment with COs:		
Nature of Assessment	**CO1**	**CO2**
Mid Semester / Sessional Examination 1		
Sessional Examination 2	x	x
Presentations		
End Semester Exam		

Feedback Process:	Sessional examination Feedback
Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 3. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3.
Additional References	1. Avers D. Daniels and Worthingham's Muscle Testing. Elsevier; First edition (2018)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Electrotherapy - II**
Course Code	**PTH2103**
Academic Year	Second
Semester	III
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy and Physiology
Course Synopsis	The Module will enable the student to understand the use and application of low and medium frequency electrotherapeutic modalities in Physiotherapy.

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

CO1	Outline indications, contra-indications, precautions, dangers and effects of low and medium frequency electrotherapeutic modalities. (C2)
CO2	Explain the use and procedure for application of low and medium frequency electrotherapeutic modalities. (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Introduction to low and medium frequency currents	1. Define and list the types of low and medium frequency currents (C1) 2. Explain the physiological and therapeutic effects of low and medium frequency currents (C2)	02
Unit 2:		
Nerve and muscle stimulation	1. Recall the surface anatomy of nerves and muscles (C1) 2. Recall classification and physiological properties of muscle and nerve (C1) 3. Explain the nerve and muscle responses to an external electrical stimulus(C2) 4. List the type of currents used for nerve and muscle stimulation (C1) 5. Define motor point and label the motor points for extremities, face and trunk (C1) 6. Explain the indication, contraindications and dangers of nerve and muscle stimulation (C2) 7. Explain faradism under pressure and faradic foot bath (C2)	07

Content	Competencies	Number of Hours
Unit 3:		
Constant Direct current	1. Summarize the effects and uses of constant direct current as a therapeutic intervention (C2) 2. Define iontophoresis (C1) 3. Classify the ions and and explain the effects and uses of ions for iontophoresis (C2) 4. Explain the properties of electrodes and electrode reactions (C2) 5. Explain the procedure of Iontophoresis (C2) 6. List the dangers of Iontophoresis (C1)	04
Unit 4:		
Diagnostic tests using electrical stimulation	1. Recall the classification of peripheral nerve injuries (C1) 2. Recall stages of Wallerian degeneration and regeneration(C1) 3. Explain the procedural steps, advantages and disadvantages of Faradic –Galvanic tests 4. Explain the procedural steps, advantages and disadvantages and plotting of strength duration curve (C2) 5. Explain rheobase and chronaxie (C2) 6. Interpret the results of Faradic- Galvanic tests and strength duration curve (C2)	04
Unit 5:		
Transcutaneous electrical nerve stimulation (TENS)	1. Outline the types of TENS (C2) 2. Explain the indications, contraindications, merits and demerits of TENS (C2) 3. Explain the procedural steps in the application of TENS (C2)	03
Unit 6:		
Interferential Therapy (IFT) and combination therapy	1. Explain interferential currents (C2) 2. Explain the therapeutic effects of IFT (C2) 3. Explain the indications/contraindication, merits and demerits of IFT (C2) 4. Explain the modes, parameters, electrode types and procedural steps in the application of IFT (C2) 5. Explain combination therapy (C2)	04
Unit 7:		
Management of pain using Electro-physical modalities	1. Recall the neurophysiology of pain (C2) 2. Recall the process of pain modulation (C2) **3.** Choose the electro-physical modality for management of acute and chronic pain (C3)	02

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	10	20
Small group discussion (SGD)		

Self-directed learning (SDL)	3	
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision Practical		
Assessment		
Total	**26**	**46**

Assessment Methods:	
Formative:	**Summative:**
Assignments/ Presentations	Sessional Exam (Theory)
	End semester examination

Mapping of Assessment with COs:

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Forester and Palastanga. Clayton's Electrotherapy: Theory and Practice: 9/e; Bailliere Tindall 2. Watson, Tim. *Electrotherapy: Evidence-based Practice*. Edinburgh: Churchill Livingstone, 2008.
Additional Reference:	1. Reed A., Low J .Electrotherapy Explained: Principles and Practice, Butterworth-Heinemann

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Electrotherapy - II**
Course Code	**PTH2112**
Academic Year	Second
Semester	III
Number of Credits	02
Course Prerequisite	Basic knowledge in Anatomy, Physiology and Theoretical concepts for Electrotherapy
Course Synopsis	This module will enable the students to choose and demonstrate the procedure of high frequency electrotherapeutic modalities

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

CO1	Demonstrate the basic etiquettes in addressing and interviewing clients and sequence of events leading to treatment setting (P3,A2)
CO2	Choose the low and medium frequency electrotherapeutic modalities for clinical conditions (C3)
CO3	Display the procedural steps for application of low and medium frequency electrotherapeutic modalities (P4, A1)

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						

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Nerve muscle stimulation	1. Recall and identify motor points of face, trunk and extremities (C1 ,P1) 2. Perform the procedural steps for electrical nerve and muscle stimulation (P4, A2) 3. Perform the procedural steps for faradic foot bath and faradism under pressure for upper and lower limb .(P4, A2)	26
Unit 2:		
Iontophoresis	1. Choose the ions, electrode and dosage for iontophoresis (C3,P1) 2. Perform the procedural steps for iontophoresis (P4,A2)	04
Unit 3:		
Faradic-Galvanic test and Strength duration	1. Perform the procedural steps for FG test and SD curve(P4,A2)	08

Content	Competencies	Number of Hours
curve	2. Identify and interpret the responses to FG test (C3,P3,A2) 3. Interpret SD curves and measure Rheobase and Chronaxie (C2, P3)	
Unit 4:		
Transcutaneous electrical nerve stimulation (TENS)	1. Choose the method of application and perform the procedural steps for TENS (C3,P4, A2)	06
Unit 5:		
Interferential Currents/Therapy (IFT)	1. Choose the type of electrode and select the treatment parameters (C3,P1) 2. Choose the method of application, and perform the procedural steps for IFT (C3, P4, A2)	08

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	26	13
Revision	26	13
Assessment		
Total	**52**	**26**

Assessment Methods:	
Formative:	**Summative:**
OSPE/OSCE	Sessional Exam (Viva-voce and Practical)

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

Feedback Process:	Sessional examination Feedback
Main Reference:	1. Forester and Palastanga. Clayton's Electrotherapy: Theory and Practice: 9/e; Bailliere Tindall 2. Watson, Tim. *Electrotherapy: Evidence-based Practice*. Edinburgh: Churchill Livingstone, 2008.
Additional Reference:	1. Reed A., Low J .Electrotherapy Explained: Principles and Practice, Butterworth-Heinemann

SEMESTER - IV

COURSE CODE	:	COURSE TITLE
PHC2201	:	Pharmacology
CPY2201	:	Clinical Psychology
YGA2221	:	Fundamentals of Yoga Therapy
PTH2201	:	Exercise Physiology
PTH2202	:	Theoretical concepts in Exercise therapy - II
PTH2211	:	Practical in Exercise therapy - II
PTH2203	:	Ethics, Entrepreneurship, and Leadership
PTH2231	:	Clinical Practice

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Pharmacology**
Course Code	**PHC2201**
Academic Year	Second
Semester	IV
Number of Credits	2
Course Prerequisite	Basic knowledge of Anatomy, Physiology, Biochemistry, Microbiology and Pathology
Course Synopsis	The course briefly addresses the classes of drugs acting on various systems of human body. This module will be delivered through lectures. Theory examination will be used to assess the students' transferable skills and learning outcomes. This module helps the students to understand the kinetics, dynamics and therapeutics of drugs that are relevant to allied health practice. Emphasis is laid on drugs that are commonly used by allied health practioners. This module provides the background for decision making and treatment based on basic knowledge of drugs.

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

CO1	Explain indications, rationale, pharmacological actions, pharmacokinetic features, adverse effects, contraindications and drug interactions of commonly used medications in allied health practice (C1)
CO2	Describe mechanism of action, uses, adverse effects, contraindications and drug interactions of clinically important drugs that are used in allied health practice which may directly or indirectly influence management of health and diseases by allied heath practioners (C1)
CO3	Apply fundamental pharmacology knowledge in allied health sciences (C2)
CO4	Use pharmacology knowledge in decision making of patient/client management. (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
General Pharmacology	**A. Introduction:** 1. Define the following terms: pharmacology, pharmacokinetics, pharmacodynamics, pharmacotherapeutics, clinical pharmacology and	4

Content	Competencies	Number of Hours
	toxicology (C1) 2. Define drug with examples. (C1) 3. List different sources of drugs with examples. (C1) **B. Routes of drug administration:** Explain the advantages and disadvantages of the following routes of drug administration with examples of drugs administered by these routes: oral, subcutaneous, intramuscular, intravenous, intradermal, topical, transdermal, inhalational, sublingual and rectal (C2) **C. Pharmacokinetics:** 1. Describe drug transport mechanisms. (C2) 2. Explain the factors affecting drug absorption. (C2) 3. Define bioavailability. (C1) 4. Explain first pass metabolism with examples of drugs having high first pass metabolism. (C2) 5. Define volume of distribution. (C1) 6. Define biotransformation. (C1) 7. List the organs involved in biotransformation. (C1) 8. List the types of biotransformation reactions. (C1) 9. List different routes of drug excretion. (C1) 10. Define the following terms: plasma half-life, first order kinetics and zero order kinetics (C1) **D. Pharmacodynamics:** 1. Describe the different types of non-receptor mediated mechanisms of drug action with examples. (C2) 2. List different types of receptors with examples. (C1) 3. Define the following terms: Affinity, intrinsic activity, efficacy, potency, agonist and antagonist. (C1) 4. Define the following with examples: competitive antagonist and non-competitive antagonist. (C1) 5. Explain the following with examples: synergism and tolerance. (C2) **E. Drug toxicity and safety:** 1. Define therapeutic index. (C1) 2. Define adverse drug reactions. (C1) 3. Describe the following terms with examples: predictable adverse drug reactions, unpredictable adverse drug reactions, side effects, toxic effects, idiosyncrasy, hypersensitivity, teratogenicity, iatrogenic disease, photosensitivity, dependence (C2)	
Unit 2:		
Drugs acting on Autonomic nervous system including skeletal muscle relaxants	**A. Cholinergic drugs:** 1. Name the parasympathetic neurotransmitter. (C1) 2. List the types of different cholinergic receptors. (C1) 3. Name the locations of different cholinergic receptors. (C1) 4. Describe the responses mediated through different cholinergic receptors at various sites. (C2) 5. Tell the classification of cholinergic drugs based on	4

Content	Competencies	Number of Hours
	their mechanism of action. (C1) 6. Describe the mechanism of action of anticholinesterases. (C2) 7. List the therapeutic uses of anticholinesterases. (C1) 8. List the adverse effects of anticholinesterases. (C1) **B. Anticholinergic drugs:** 1. Tell the classification of anticholinergic drugs based on their source. (C1) 2. Describe the pharmacological actions of atropine. (C2) 3. List the therapeutic uses of atropine. (C1) 4. List the adverse effects of atropine. (C1) **C. Neuromuscular blocking drugs:** 1. Tell the classification of skeletal muscle relaxants based on their mechanism of action. (C1) 2. List the uses of the following: centrally acting skeletal muscle relaxants and peripherally acting skeletal muscle relaxants. (C1) **D. Adrenergic drugs:** 1. Name the sympathetic neurotransmitters. (C1) 2. List the types of different adrenergic receptors. (C1) 3. Name the locations of different adrenergic receptors. (C1) 4. Describe the responses mediated through different adrenergic receptors at various sites. (C2) 5. Describe the effects of adrenaline on: CVS, smooth muscle and metabolism (C2) 6. List commonly used adrenergic drugs. (C1) 7. List the common therapeutic uses of adrenergic drugs. (C1) **E. Adrenergic receptor antagonists:** 1. Tell the classification of adrenergic receptor antagonists based on their receptor selectivity. (C1) 2. List the important uses of α-blockers. (C1) 3. List the important uses of β-blockers. (C1) 4. List the adverse effects of β-blockers. (C1)	
Unit 3:		
Drugs acting on Central nervous system	**A. Sedative & hypnotics**: 1. Define the following terms with examples: sedative and hypnotics. (C1) 2. List the benzodiazepines. (C1) 3. List the therapeutic uses of benzodiazepines. (C1) 4. List the adverse effects of benzodiazepines. (C1) **B. Antiepileptic drugs:** 1. List commonly used antiepileptic drugs. (C1) 2. List the therapeutic uses of the following: phenytoin, carbamazepine and sodium valproate. (C1) **C.** List the adverse effects of the following: phenytoin, carbamazepine and sodium valproate. (C1)	6

Content	Competencies	Number of Hours
	D. General anaesthetics: 1. Define general anaesthetics. (C1) 2. List inhalational and intravenous general anaesthetics. (C1) 3. Describe preanaesthetic medication. (C1) 4. List the drugs used in preanaesthetic medication. (C1) **E. Local anaesthetics:** 1. Define local anaesthetics. (C1) 2. Explain the mechanism of action of local anaesthetics. (C2) 3. List the local anaesthetics. (C1) 4. List the indications of local anaesthetics. (C1) 5. List the different techniques of local anaesthesia. (C1) **F. Opioids:** 1. List the commonly used opioids. (C1) 2. Explain the pharmacological actions of morphine. (C2) 3. List the uses of morphine. (C1) 4. List the adverse effects of morphine. (C1) 5. List the contraindications of morphine. (C1) 6. Mention the antidote used for opioid poisoning. (C1) **G. Non-steroidal anti-inflammatory drugs (NSAIDs):** 1. List the commonly used NSAIDs. (C1) 2. Explain the mechanism of action of aspirin. (C2) 3. List the uses of aspirin. (C1) 4. List the adverse effects of aspirin. (C1) **H. Psychopharmacology:** 1. List the antipsychotics. (C1) 2. Explain the mechanism of action of chlorpromazine. (C2) 3. List the uses of chlorpromazine. (C1) List the adverse effects of chlorpromazine. (C1)	
Unit 4:		
Drugs acting on Gastrointestinal system	**A. Drugs for peptic ulcer:** 1. Tell the classification of drugs used in peptic ulcer based on their mechanism of action. (C1) 2. Explain the mechanism of action of the following: proton pump inhibitors (PPIs), H_2 blockers, antacids and ulcer protectives. (C2) 3. List the therapeutic uses of the following: proton pump inhibitors (PPIs), H_2 blockers, antacids and ulcer protectives. (C1) 4. List the adverse effects of the following: proton pump inhibitors (PPIs), H_2 blockers, antacids and ulcer protectives. (C1) **B. Antiemetics:** 1. List various classes of antiemetics with examples. (C1)	1

Content	Competencies	Number of Hours
	2. List the therapeutic uses of the following: prokinetics, 5-HT_3 antagonists, anticholinergics and H_1 antihistaminics. (C1) 3. List the adverse effects of the following: prokinetics, 5-HT_3 antagonists, anticholinergics and H_1 antihistaminics. (C1) **C. Laxatives and antidiarrhoeals**: 1. List various classes of laxatives with examples. (C1) 2. List the therapeutic uses of laxatives. (C1) 3. List the composition of WHO-ORS. (C1) **4.** List the antimotility and antisecretory agents used in diarrhea. (C1)	
Unit 5:		
Drugs acting on Cardiovascular system	**A. Antihypertensives:** 1. Tell the classification of antihypertensive agents based on their mechanism of action. (C1) 2. Explain the antihypertensive action of the following: ACE Inhibitors/ARBs, calcium channel blockers, thiazides, beta blockers (C2) 3. List the uses of the following: ACE Inhibitors and diuretics. (C1) 4. List the adverse effects of the following: ACE Inhibitors and diuretics. (C1) **B. Drugs used in congestive heart failure (CHF):** 1. Tell the classification of drugs used in the treatment of congestive heart failure based on their mechanism of action. (C1) 2. Explain the mechanism of action of digoxin. (C2) **C. Antianginal drugs**: 1. List the drugs used for acute attack and chronic prophylaxis of angina. (C1) 2. Explain the mechanism of action of nitrates. (C2) 3. List the therapeutic uses of nitrates. (C1) 4. List the adverse effects of nitrates. (C1) **D. Hypolipidemic:** 1. List hypolipidemics. (C1) 2. Explain the mechanism of action of statins. (C2) **3.** List the adverse effects of statins. (C1)	3
Unit 6:		
Drugs acting on Respiratory system	**A. Pharmacotherapy of bronchial asthma:** 1. List anti-asthmatic drugs belonging to following class: β_2- agonists, anticholinergics, mast cell stabilizers and inhaled glucocorticoids. (C1) 2. Explain the antiasthmatic action of the following: β_2-agonists, anticholinergics, mast cell stabilizers and inhaled glucocorticoids. (C2) 3. List the adverse effects of the following: β_2-agonists, anticholinergics, mast cell stabilizers and inhaled glucocorticoids. (C1) **B. Pharmacotherapy of cough:**	2

Content	Competencies	Number of Hours
	1. List drugs used in dry and productive cough. (C1) 2. Define the following terms with examples: mucolytics, expectorants, antitussives. (C1)	
Unit 7:		
Chemotherapy	**A. General aspects:** Define the following terminologies with examples: antimicrobial agents (AMAs), antibiotic, bacteriostatic, bactericidal, chemoprophylaxis and suprainfection (C1) **B. Beta lactam antibiotics:** 1. List the groups of beta lactam antibiotics with examples (C1) 2. Explain the mechanism of action of beta lactam antibiotics. (C2) 3. List penicillins. (C1) 4. List the uses of penicillins (C1) 5. List the adverse effects of penicillins (C1) **C. Cotrimoxazole:** 1. Explain the mechanism of action of cotrimoxazole. (C2) 2. List the uses of cotrimoxazole. (C1) 3. List the adverse effects of cotrimoxazole (C1) **D. Aminoglycosides**: 1. List aminoglycosides. (C1) 2. Mention the common features of aminoglycosides. (C1) 3. List the uses of aminoglycosides. (C1) 4. List the adverse effects of aminoglycosides. (C1) **E. Tetracyclines:** 1. List commonly used tetracyclines. (C1) 2. List the uses of tetracyclines. (C1) 3. List the adverse effects of tetracyclines. (C1) **F. Macrolides:** 1. List macrolides. (C1) 2. List the uses of macrolides. (C1) 3. List the adverse effects of macrolides. (C1) **G. Fluoroquinolones:** 1. List commonly used fluoroquinolones (C1) 2. List the uses of fluoroquinolones (C1) 3. List the adverse effects of fluoroquinolones (C1) **H. Antifungal agents:** 1. List azole antifungals. (C1) 2. List the uses of azoles. (C1) 3. List the adverse effects of azoles. (C1) **I. Antiviral drugs:** 1. List classes of anti-retroviral (anti-HIV) drugs with examples. (C1) 2. List the commonly used antiviral drugs (C1) 3. Explain the mechanism of action of acyclovir. (C1) 4. List the uses of acyclovir. (C1) 5. List the adverse effects of acyclovir. (C1)	6

Content	Competencies	Number of Hours
	J. Antitubercular drugs: 1. Tell the classification of antitubercular drugs with examples. (C1) 2. List the adverse effects of the following: isoniazid, rifampicin, pyrazinamide, ethambutol. (C1) 3. List the drugs used for short course chemotherapy of pulmonary TB. (C1) **K. Antileprotic drugs:** 1. List antileprotic drugs (C1) 2. List the drugs used for multidrug therapy (MDT) for paucibacillary and multibacillary leprosy. (C1) **L. Antiamoebic drugs**: 1. List nitroimidazoles. (C1) 2. List the uses of nitroimidazoles. (C1) 3. List the adverse effects of nitroimidazoles. (C1) **M. Anthelmintics:** 1. List anthelmintic drugs. (C1) 2. List the uses of the following: albendazole, mebendazole and DEC. (C1) 3. List the adverse effects of the following: albendazole, mebendazole and DEC. (C1) **N. Antimalarial drugs**: 1. List antimalarial drugs. (C1) 2. List the uses of chloroquine. (C1) 3. List the adverse effects of chloroquine. (C1) **O. Anticancer drugs**: 1. Give examples for anticancer drugs. (C1) **2.** List the general toxicities of anticancer agents. (C1)	
Unit 8:		
Hormones and related drugs	**A. Glucocorticoids**: 1. List glucocorticoids based on their duration of action. (C1) 2. Explain the anti-inflammatory and immunosuppressant actions of glucocorticoids. (C2) 3. List the therapeutic uses of glucocorticoids. (C1) 4. List the adverse effects of glucocorticoids. (C1) **B. Antidiabetic drugs:** 1. List insulin preparations based on their duration of action. (C1) 2. List the adverse effects of insulin. (C1) 3. Tell the classification of oral antidiabetic drugs based on their chemistry. (C1) 4. List the adverse effects of various classes of oral antidiabetic drugs. (C1) **C. Thyroid and anti-thyroid drugs:** 1. List the thyroid hormone preparations. (C1) 2. List the uses of thyroid hormone preparations. (C1) 3. List the antithyroid drugs acting at different steps of thyroid hormone synthesis. (C1) 4. List the uses of antithyroid drugs. (C1)	2

Content	Competencies	Number of Hours
Unit 9:		
Special topics	1. Describe the following with examples: chemical name, non- proprietary/generic name and proprietary/brand name of a drug. (C1) 2. List various sources of drug information. (C1) 3. Explain different parts of a prescription. (C2) **4.** Describe the various standard abbreviations and symbols used in prescription. (C1)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	30	60
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-
Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	-	-
Total	**30**	**60**

Assessment Methods:	
Formative:	**Summative:**
Quiz	Mid Semester/Sessional Exam (Theory)
Unit test	End Semester Exam (Theory)

Mapping of Assessment with COs:
Note: Map how each of the COs are assessed (e.g. indicate with a cross)

Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**		
Sessional Examination 1	x	x	x	x		
Sessional Examination 2	x	x	x	x		
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	Essentials of Medical Pharmacology: K.D. Tripathi, Jaypee brothers medical publishers (P) Ltd, 8th edition, 2018
	Pharmacology for Medical Graduates: Tara Shanbhag, Smita Shenoy, Elsevier Publications, 4th edition, 2019
Additional References	Principles of Pharmacology: H L Sharma and K. K Sharma, Paras Medical Publishers, 3rd edition, 2017
	Lippincott illustrated reviews: Pharmacology: Karen Whalen, Wolters Kluwer, 7th edition, 2018

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Psychology**
Course Code	**CPY2201**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Nil
Course Synopsis	1. Orients and familiarises students towards the basic psychological processes 2. Enables the students to understand how psychological principles are applied in day to day life. 3. Introduce the students to the field of clinical psychology 4. Orients and familiarise them towards various psychological disorders and psychological interventions.

Course Outcomes (Cos): **At the end of the course student shall be able to:**	
CO1	Explain the basic concepts in Psychology. (C2)
CO2	Explain how the processes of perception , learning, memory , thinking and intelligence contributes to the uniqueness of the individual (C2)
CO3	Outline the role of motivation , emotion and personality in shaping human behaviour (C2)
CO4	Develop an understanding of normality and abnormality in clinical psychology (C3)
CO5	Outline the various signs and symptoms of psychiatric disorders (C2)
CO6	Explain the various psychological interventions for various mental health conditions (C2)

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							
CO5	x					x		
CO6	x					x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Introduction to Psychology	1. Define Psychology(C1) 2. Outline the evolution of Psychology as a scientific discipline (C2) 3. Summarise the modern schools of Psychology 4. Enumerate the different branches of	3

Content	Competencies	Number of Hours
	Psychology(C1) 5. What is Introspection? List the merits and demerits of introspection (C1) 6. Explain the importance of Experimental method in the field of Psychology(C2) 7. Explain the observation method in Psychology (C2)	
Unit 2:		
Perception	1. Define Perception (C1) 2. Describe the various principles of Perceptual groupings (C2) 3. Illustrate the Gestalt laws of perception (C2) 4. Define Perceptual constancy and explain its types(C2) 5. Explain Monocular and Binocular cues in Perception (C2) 7. Explain types of motion perception (C2)	3
Unit 3:		
Learning	1. Define Learning (C1) 2. Explain Pavlov's Classical Conditioning(C2) 3. Summarize the various processes of Classical Conditioning with examples (C2) 4. Explain the applications of Classical Conditioning(C2) 5. What is Operant Conditioning (C1) 6. Compare the types of reinforcement and Punishment(C2) 7. Explain with the examples the schedules of Reinforcement (C2) 8. Explain the applications of Operant Conditioning(C2) 8. Explain observation learning with its classic experiment (C2) 9. Illustrate the processes in observation learning (C2)	3
Unit 4:		
Memory	1. Define Memory (C1) 2. List the processes that underlie memory (C1) 3. Explain the characteristics of different types of memory(C2) (sensory, STM, LTM) 4. Summarise the different theories of forgetting (C2) (Decay, motivated forgetting, interference, cue dependant displacement) 5. List the various strategies to improve memory (C1)	3
Unit-5:		
Thinking & Problem solving	1. Define thinking (C1) 2. How thoughts are represented (C1) 3. Define concepts(C1) 4. Compare the different types of concept (C2) 5. Enumerate the steps in creative thinking (C1) 6. List the steps involved in problem solving (C1) 7. What are the different strategies used to solve	2

Content	Competencies	Number of Hours
	problems (C1) (Trial & error, Heuristics, Algorithm)	
Unit-6:		
Intelligence	1. Define Intelligence (C1) 2. Summarise the various theories of Intelligence (C2) (Two factor, Crystallised and Fluid, Multiple intelligence) 3. List the different types of Intelligence tests (C1) 4. Define Emotional Intelligence (C1) 5. What are the different components of emotional intelligence? (C1)	3
Unit-7:		
Motivation & Conflict	1. Define Motivation (C1) 2. Summarize the biological theories of Motivation (C2) (Drive reduction theory, Optimal arousal theory, Instinct theory) 3. Explain the Psychological theories of Motivation (C2) (Maslow's hierarchy theory) 4. Define Conflict (C1) 5. Explain the types of Conflict with examples (C2) (Approach- Approach conflict, Avoidance-Avoidance conflict, Approach- Avoidance conflict and Double Approach- Avoidance conflict) 6. Summarise the different ways to handle conflict (C2)(Task and defense oriented)	3
Unit-8:		
Emotion	1. Define Emotion (C1) 2. List the characteristics of Emotion (C1) 3. Explain the various theories of Emotion (C2)(James-Lange, Cannon- Bard, Schatcher- Singer)	2
Unit-9:		
Personality	1. Define Personality(C1) 2. Explain the Psychodynamic theory of Personality (C2) 3. Explain the trait approach towards Personality (C2) 4. Summarize Rogers' humanistic approach in understanding Personality (C2) 5. Enumerate the various assessment methods in studying Personality (C1)	4
Unit-10:		
Introduction to Clinical Psychology	1. Define clinical Psychology (C1) 2. Outline the scope of clinical psychology (C2) 3. Explain the methods in clinical psychology (C2) (case history, observation, survey and interview) 4. Explain the concept of normality and abnormality (C2) 5. Identify the differences between various models of mental disorders (C3) (biological, psychodynamic, learning, cognitive, social cultural)	2
Unit-11:		
Psychiatric disorders: an	1. Compare mental disorders based on DSM V & ICD 10 classificatory systems. (C2)	7

Content	Competencies	Number of Hours
overview	2. Compare DSM V & ICD 10 classificatory systems. (C2) 3. Outline various psychotic disorders (C2) (Schizophrenia and delusional disorders) 4. Summarise mood disorders (C2) (Depression, Mania and Bipolar disorders) 5. Summarise various substance use Disorder (C2) (Intoxication, Abuse, harmful use and Dependence) 6. Outline the various psychoactive substances and it corresponding symptoms (C2) 7. Outline the various anxiety disorders (C2) (GAD, SAD, OCD, Phobias and Panic disorder) 8. Identify the difference between fear and anxiety (C3) 9. Outline the various personality disorders based on ICD 10 (C2) 10. Outline the various child hood behavioural disorders (C2) (ADHD, CD, ODD, MR, Autism, SLD)	
Unit-12:		
An overview of psychological interventions	1. Define counselling (C1) 2. Outline various types of counselling (C2) 3. Explain the theoretical framework of behaviour therapy (C2) 4. Explain the various behaviour therapy techniques (C2) (Shaping, chaining, time-out, token economy, desensitisation and aversive techniques) 5. What is psychodynamic psychotherapy (C1) 6. Outline the various concepts in psychodynamic psychotherapy (C2) (Free association, Dream analysis, transference and counter transference) 7. Outline various principles of supportive therapy (C2) 8. Define crisis (C1) 9. List the steps in crisis intervention (C1)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	-
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-
Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	-	-
Total	**39**	**117**

Assessment Methods:							
Formative:	**Summative:**						
Nil	Mid Semester/Sessional Exam (Theory)						
Nil	End semester exam (Theory)						
Mapping of Assessment with COs:							
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester/Sessional examination		x	x				
End semester examination		x	x	x	x	x	x
Feedback Process:	Mid-Semester Feedback						
	End-Semester Feedback						
Main Reference:	1. Baron, R. A., Byrne, D., & Mankowitz, B. H. (1977). Psychology: Understanding behaviour. Philadelphia: W.B. Saunders Co. 2. Feldman, R. S. (1993). Understanding psychology. New York: McGraw-Hill. 3. Korchin, S.J. (2004) Modern Clinical Psychology. New Delhi: CBS Publishers & Distributors 4. Ahuja, N. (2011) A Short Textbook Of Psychiatry. New Delhi: Jaypee Brothers Medical Publishers						
Additional References	1. Myers, D. G. (2005). *Exploring psychology*. New York, NY: Worth Publishers.						

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Fundamentals of Yoga therapy**
Course Code	**YGA2221**
Academic Year	Second
Semester	IV
Number of Credits	02
Course Prerequisite	Student is oriented to human anatomy and physiology
Course Synopsis	The module is intended to provide the student the understanding of fundamentals of yoga therapy

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

CO1	Understand the principles of Yoga (C2)
CO2	Display different Yoga postures (P4)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to Yoga therapy	1. Define Yoga (C1) 2. Outline history of yoga and yoga therapy (C2) 3. List the Principles of Yoga technique, benefits, contraindications & precautions (C1)	3
Unit 2		
Asanas in supine	1. List the asanas in supine and its uses (C1) 2. List the indications, contraindications and cautions (C1) 3. Perform Pavanamuktasana Padottanasana, Setubandhasana, Sarvangasana , Shavasana (P4)	8
Unit 3		
Asanas in Prone	1. List the asanas in prone and its uses (C1) 2. List the indications, contraindications and cautions 3. Perform Makarasana , Perform Bhujangasana, Shalabhasana, Dhanurasana (P4)	5
Unit 4		
Asanas in Sitting	1. List the asanas in sitting and its uses (C1) 2. List the indications, contraindications and cautions (C1) 3. Perform Swastikasana,Vajrasana, Supta Vajrasana, Paschimottanasana Purvottanasana	11

Content	Competencies	Number of Hours
	Janushirshasana, Marichasana (P4)	
Unit 5		
Asanas in Standing	1. List the asanas in standing and its uses (C1) 2. List the indications, contraindications and cautions(C1) 3. Display Parivrta Tadasana Padangushtasana (P4) 4. Display Trikonasana (P4) 5. Perform Parshvakonasana (P4) 6. Display Parsvottanasana (P4) 7. Perform Prasarita Padottanasana (P4)	8
Unit 6		
Pranayama	1. List the indications, contraindications and cautions of pranayama (C1) 2. Perform Anuloma viloma pranayama (P4) 3. Perform Bhramari pranayama (P4)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	13
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	16	13
Revision	5	
Assessment	5	
Total	**39**	**26**

Assessment Methods:	
Formative:	**Summative:**
Assignment	Sessional Examination

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Sessional Examination	x	x				
Assignments/Presentations	x	x				

Feedback Process:	Mid-Semester Feed back
	2nd Sessional Feed back
Main Reference:	1. Light on Yoga: The Classic Guide to Yoga by the World's Foremost Authority by B.K.S. Iyengar

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Exercise Physiology**
Course Code	**PTH2201**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	The student has basic knowledge in anatomy, physiology and biochemistry
Course Synopsis	This module is designed to – Enable students to understand the physiological responses and adaptations to exercise including responses to ergogenic aids, temperature and environment.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the mechanism by which body acquires, stores and transfers energy during rest and exercise (C2)
CO2	Outline the physiological responses and adaptations to exercises including responses to ergogenic aids, temperature and environment (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Introduction to exercise physiology	1. Define and explain the terminologies of exercise physiology (C2) 2. Relate exercise physiology to physiotherapy practice (C2)	01
Unit 2:		
Nutrition and Bioenergetics	1. List the sources of energy and classify nutrients (C2) 2. Recall energy metabolism at rest and explain its application in exercise (C2) 3. Explain the direct and indirect methods for measurement of energy expenditure (C2)	05
Unit 3:		
Physiological response to exercise in the cardiovascular system	1. Explain the acute physiological responses and chronic systemic adaptations to exercise in the cardiovascular system (C2)	04

Content	Competencies	Number of Hours
Unit 4:		
Physiological response to exercise in the neuromuscular system	1. Explain the acute physiological responses and chronic adaptations to exercise in the neuromuscular system (C2)	04
Unit 5:		
Physiological response to exercise in the respiratory system	1. Explain the acute physiological responses and chronic adaptations to exercise in the respiratory system (C2)	02
Unit 6:		
Metabolic responses to exercise	1. Explain metabolic responses to exercise (C2)	02
Unit 7:		
Thermoregulatory responses to exercise	1. Explain acute and chronic thermoregulatory responses to exercise (C2)	03
Unit 8:		
Physiological response to exercise in the renal and the endocrine system	1. Explain acute physiological responses and chronic adaptations responses to exercise in the renal and the endocrine system (C2)	04
Unit 9:		
Physiological response to exercise in the immune system	1. Explain the acute response and chronic adaptations to exercise in the immune system (C2)	02
Unit 10:		
Hypobaric, Hyperbaric and microgravity environment	1. Explain the physiological responses to Hypobaric, Hyperbaric and microgravity environment at rest and exercise (C2**)**	04
Unit 11:		
Sports Physiology	1. Explain athletic diet and hydration (C2) 2. Define doping(C1) 3. List, classify and explain the ergogenic aids used in sports (C2) 4. Explain the effects of ergogenic aids 5. Discuss legal issues associated with the use of Ergogenic aids (C2)	04
Unit 12:		
Fatigue during exercise	1. Define fatigue (C1) 2. List the features of fatigue (C1) 3. Explain the types of fatigue and its physiological basis (C2) 4. Explain the strategies for management of fatigue (C2)	04

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	**52**
Seminar	13	
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**52**

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

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Katch, Victor L, William D. McArdle, Frank I. Katch, and William D. McArdle. *Essentials of Exercise Physiology*. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins Health, 2011. 2. Wilmore, Jack H, and David L. Costill. *Physiology of Sport and Exercise*. Champaign, IL: Human Kinetics, 1994.
Additional References	1. Thompson, Walter R. *Acsm's Clinical Exercise Physiology*. , 2019.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Exercise therapy -II**
Course Code	**PTH2202**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Basic knowledge in Anatomy and Physiology
Course Synopsis	This module will enable the students to understand the uses and procedural steps in delivering therapeutic exercise techniques including proprioceptive neuromuscular facilitation for improving posture, balance, coordination and ambulation.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Outline the principles of evaluation and treatment in the implementation of therapeutic exercises for posture, movement and mobility (C2)
CO2	Explain the measurement and prescription of mobility aids (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Proprioceptive Neuromuscular facilitation	1. Explain the theoretical principles of PNF (C2) 2. List the indications and contraindications for basic and specific techniques of PNF (C1) 3. Explain the basic and specific techniques of PNF and its uses (C2)	06
Unit 2:		
Posture	1. Define posture and related terminologies (C1) 2. Explain the normal postural development and the mechanisms for postural control (C2) 3. Explain the analysis of posture in lying, sitting, standing and forward bending (C2) 4. Explain factors influencing posture and summarize postural deviations (C2) 5. Explain the principles and methods of postural re-education (C2)	08
Unit 3:		
Functional re-education	1. Explain the principles of Functional re-education (C2) 2. Explain the techniques and muscle activity to attain and maintain functional positions (C2)	05

Content	Competencies	Number of Hours
	3. Explain the effects and uses of functional positions(C2) 4. Outline the types of transfer (C2) 5. Explain the principles and steps for a safe transfer (C2)	
Unit 4		
Gait evaluation & re-education	1. Recall gait cycle (C1) 2. Explain pathological gait (C2) 3. Summarize the methods of gait evaluation (C2) 4. Explain the principles of gait re-education (C2)	06
Unit 5		
Neuromuscular coordination & Balance	1. Define balance and coordination (C1) 2. Relate the physiology of balance and coordination (C2) 3. Outline tests for balance impairment and incoordination (C2) 4. Explain Frenkel's exercises and methods of balance training (C2)	08
Unit 6		
Mobility aids	1. Explain different types of walking aids and wheelchair (C2) 2. Explain the indications, contraindications, merits and demerits and complications of walking aids and wheelchair (C2) 3. Outline factors influencing selection of walking aids and wheelchair (C2) 4. Explain the measurement and prescription of walking aids and wheelchair (C2) 5. Explain ambulation training using walking aids and wheelchair (C2) 6. Explain the methods of wheelchair transfer (C2)	06

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**SLT (Student learning time)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**72**
Assessment Methods:		

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

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Gardiner MD. The principles of exercise therapy. Bell; 1957. 2. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18 3. Levangie, Pamela K, and Cynthia C. Norkin. Joint Structure and Function: A Comprehensive Analysis. Philadelphia, PA: F.A. Davis Co, 2005 4. Susan B. O' Sullivan-Physical Rehabilitation
Additional references	1. Tertraplegia and Paraplegia. Ida Bromley 2. PNF in practice. Susan Adler

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Practical in Exercise therapy -II**
Course Code	**PTH2211**
Academic Year	Second
Semester	IV
Number of Credits	03
Course Prerequisite	Basic knowledge in Anatomy, Physiology and theoretical concepts in Exercise therapy
Course Synopsis	This module will enable the students to understand the uses and perform the procedural steps in delivering therapeutic exercise techniques including proprioceptive neuromuscular facilitation for improving posture, balance, coordination and ambulation

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

CO1	Display the basic etiquettes in addressing clients and discussing therapeutic exercise procedures (P2, A2)
CO2	Utilize the principles, follows procedural steps and perform the techniques to improve posture, movement and mobility (C3,P4,A2)
CO3	Demonstrate safe practice with self and simulated environment with equipment (P3,A2)

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:		
Proprioceptive Neuromuscular Facilitation (PNF)	1. Explain and perform the basic techniques of PNF for upper limb, lower limb and trunk (C2,P4, A2) 2. Explain and display the specific techniques of PNF (C2, P3, A2)	12
Unit 2:		
Posture	1. Perform analysis of posture in lying, sitting, standing and forward bending (P4, A2) 2. Explain and display methods of postural re-education (C2,P4,A2)	06
Unit 3:		
Functional re-education and Transfers	1. Explain and perform the techniques for functional re-education (C2, P4,A2) 2. Explain and perform exercises in each functional position (C2, P4,A2)	26

Content	Competencies	Number of Hours
	3. Display the methods of self and assisted transfers (P3,A2)	
Unit 4		
Gait evaluation & re-education	1. Identify normal and abnormal gait (P1) 2. Explain and perform evaluation of gait (C2, P4, A2) 3. Imitate abnormal gait pattern (C2, P3) 4. Make use of exercise therapy techniques and perform gait re-education (C3, P4, A2)	08
Unit 5		
Neuromuscular coordination & Balance	1. Explain and show tests for balance and coordination (C2,P2,A2) 2. Display Frenkel's exercises and methods of balance training (P3,A2)	10
Unit 6		
Mobility aids	1. Choose the walking aids and imitate types of gait pattern with walking aid (C2, P4) 2. Perform techniques for measurements of mobility aids (C3, P4, A2) 3. Display ambulation training using walking aids (P4, A2) 4. Display methods of wheelchair transfer and ambulation techniques (P4,A2)	16

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	52	104
Revision	26	**52**
Assessment		
Total	**78**	**156**

Assessment Methods:	
Formative:	**Summative:**
OSPE/ OSCE	Sessional Exam (Viva-voce and Practical)

Mapping of Assessment with COs:			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Sessional Examination 2	x	x	x
End Semester Exam			

Feedback Process:	Mid-Semester Feedback

Main Reference:	1. Levangie, Pamela K, and Cynthia C. Norkin. Joint Structure and Function: A Comprehensive Analysis. Philadelphia, PA: F.A. Davis Co, 2005 2. Gardiner MD. The principles of exercise therapy. Bell; 1957.
Additional references	1. Susan B. O' Sullivan-Physical Rehabilitation 2. Tertraplegia and Paraplegia. Ida Bromley 3. PNF in practice. Susan Adler

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Ethics, Entrepreneurship, and Leadership**
Course Code	**PTH2203**
Academic Year	Second
Semester	IV
Number of Credits	02
Course Prerequisite	Nil
Course Synopsis	This module is designed to enable the students to inculcate the principles of ethics in clinical practice, academics and research; understand the scope and challenges of entrepreneurship for a health care professional and to orient the student to leadership skills and methods of leadership in healthcare

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the principles governing ethical practice in physiotherapy (C2)
CO2	Outline the ethical dilemmas arising out of patient evaluation and management (C2)
CO3	Summarize the guidelines laid by statutory/ governing bodies for the practice of physiotherapy (C2)
CO4	Outline the basic principles, framework and models of entrepreneurship (C2)
CO5	List the models of entrepreneurship and business (C1)
CO6	Explain the attributes of a good leader and relate in context of physiotherapy (C2)

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
CO6	x							x

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Ethics		
Unit 1:		
Introduction to bioethics	1. Explain the historical background pertaining to ethics in health profession (C2) 2. Explain the four principles of bioethics (C2) 3. List the guidelines pertaining to ethical practice of physiotherapy profession.(C2)	01

Content	Competencies	Number of Hours
Unit 2:		
World Confederation of Physical Therapy (WCPT) / World Physiotherapy and Indian Association of Physiotherapists (IAP) structure and function	1. Explain the constitution and guiding principles of World Confederation of Physical Therapy (WCPT)/World Physiotherapy (C2) 2. Outline the roles and responsibilities of physiotherapists laid down by WCPT / World Physiotherapy (C2) 3. Outline the guidelines for ethical practice envisioned by WCPT / World Physiotherapy (C2) 4. Outline the organizational structure and practice guidelines laid down by Indian Association of Physiotherapists (IAP) (C2)	01
Unit 3:		
Patients' rights	1. Outline the rights of patients with respect to sharing of information, refusal of intervention and right to alternative opinion (C2)	01
Unit 4		
Ethical issues in treating vulnerable population	1. List vulnerable population (C1) 2. Explain the ethical issues in evaluation in treatment of vulnerable population (C2)	02
Unit 5		
Legal aspects in clinical practice	1. Explain the legal complexities in medico legal cases (MLC) including onus of proof and patient confidentiality. (C2) 2. Outline the legal aspects pertaining to medical negligence, liability, reportage of abuse and management of disgruntled/ difficult patients. (C2)	03
Unit 6		
Ethico-legal aspects in private practice	1. Explain the ethical aspects in private practice (C2) 2. Explain the legal aspects in private practice (C2)	01
Unit 7		
Ethical considerations in academics	1. Explain the components of academic integrity and relate it to students, teachers and administrators (C2) 2. Outline the ethical aspects of using patients for teaching (C2)	01
Unit 8		
Research ethics	1. Outline the history of research ethics (C2) 2. Explain the ICMR guidelines governing ethical conduct of research (C2) 3. Explain the composition, role and function of ethics committees (C2) 4. Explain the concept of conflict of interest in research (C2) 5. Outline publication ethics (C2)	03

Content	Competencies	Number of Hours
Entrepreneurship		
Unit 1		
Theory, models and framework of entrepreneurship	1. List the theories of Entrepreneurship (C1) 2. Explain the models and framework of entrepreneurship (C2)	01
Unit 2		
Business model development	1. Outline the process of business model development in entrepreneurship (C2)	01
Unit 3		
Finance in entrepreneurship	1. List the sources of finance for entrepreneurship (C1)	01
Unit 4		
Intellectual property rights (IPR)	1. List the types of intellectual property rights (C1) 2. Explain the role of entrepreneur in IPR (C2)	01
Unit 5		
Sustainability of innovation	1. Define sustainable entrepreneurship (C1) 2. Explain the strategies to sustain an innovation(C2) 3. List the differences between sustaining innovation and disruptive innovation (C1)	01
Unit 6		
Innovations in health and rehabilitation	1. Explain the role of innovations in health and rehabilitation (C2)	01
Unit 7		
Enterprise development	1. Define Enterprise development (C1) 2. List the steps of enterprise development (Eg. Physiotherapy clinic) (C1)	01
Unit 8		
Social entrepreneurship	1. Define Social entrepreneurship (C1) 2. Explain the role of health care professional in social entrepreneurship (C2)	01
Leadership		
Unit 1		
Models of leadership	1. List the types of leadership models (C1) 2. Compare and contrast different models of leadership (C2)	01
Unit 2		
Competencies of a good leader	1. List the characteristics of a good leader (C1) 2. Relate the relevance of leadership competencies to physiotherapy profession and public health (C2)	01
Unit 3		
Organizational leadership	1. List the important characteristics of organizational leadership (C1) 2. Explain the methods of Team building (C2)	01

Content	Competencies	Number of Hours
	3. Summarize the ways to manage conflict and resources (C2)	
Unit 4		
Strategic planning methods	1. List strategic planning methods used in healthcare industry (C1) 2. Outline advantages and disadvantages of SWOC analysis (C2)	01
Unit 5		
Leadership in physiotherapy	1. Outline the characteristics of leadership required in physiotherapy profession (C2) 2. Outline the role of emotional intelligence in physiotherapy practice (C2) 3. Explain mentorship program and Outline the need for mentioning in physiotherapy profession (C2)	01

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	
Seminar		
Small group discussion (SGD)	13	
Self-directed learning (SDL)		40
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**40**

Assessment Methods:	
Formative:	**Summative:**
Seminar	Mid Semester/Sessional Exam

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Presentations/ Mid Semester / Sessional Examination 1	x	x	x	x	x	x

Feedback Process:	Presentation/ Mid-Semester/ Sessional examination Feedback
Main Reference:	1. Ethical issues : perspectives for the physiotherapists by Fiddy davis, Kavitha Raja, Sivakumar T. Pee Pee Publishers, 2006 2. WCPT (WORLD PHYSIOTHERAPY): declaration of

	principles and position statement; www.WCPT (World Physiotherapy).org-policies 3. IAP; www.physiotherapyindia.org 4. Entrepreneurship and Innovation Toolkit. Free download at https://open.umn.edu/opentextbooks/textbooks/entrepreneurship-and-innovation-toolkit 5. Grazier KL, Metzler B. Health care entrepreneurship: financing innovation. JHealth Hum Serv Adm. 2006 Spring;28(4):485-503. 6. Leadership in Healthcare by Richard B. Gunderman https://books.google.co.in/books?id=XRBfMbFYXJsC&printsec=frontcover&dq=editions:L5Z-YTTAjH8C&hl=en&sa=X&ved=0ahUKEwi8k9DctJ7pAhWZzzgGHTIhC1kQ6AEIKDAA#v=onepage&q&f=false (Full book is available to download in PDF from Springer)
Additional References:	1. Leadership in healthcare and public health. The Ohio State University Pressbooks Columbus. Free download from https://ohiostate.pressbooks.pub/pubhhmp6615/ 2. Emer McGowan & Emma K. Stokes (2015) Leadership in the profession of physical therapy, Physical Therapy Reviews, 20:2, 122-131 https://doi.org/10.1179/1743288X15Y.0000000007

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice**
Course Code	**PTH2231**
Academic Year	Second
Semester	IV
Number of Credits	2
Course Prerequisite	Student should have basic knowledge on applied anatomy and physiology.
Course Synopsis	The module is designed to: Orient the student to clinical practice and follow professional etiquettes in patient and caregiver interaction. It also prepares the student for physiotherapy assessment and treatment techniques performed in clinical practice

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

CO1	Recognize patient data from hospital records and copy relevant information in clinical logbook (P3)
CO2	Identify clinical evaluation techniques and modes of intervention (P1)
CO3	Display professional etiquettes of engaging with patients, caregivers and other professionals.(P2,A2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Orientation to clinical practice	1. Begin to obtain relevant patient data from medical records (P2) 2. Notice terminologies and abbreviations used in medical records (P1) 3. Recognize the tools and equipment in the clinical area (P1) 4. Recognize the sequence of events in client and caregiver interactions (P1) 5. Observe, relates and prepares for physiotherapy assessment and treatment techniques performed in clinical practice(P2) 6. Display and conforms to professional behaviour while engaging with patients, caregivers and fellow professionals (P2, A2) 7. Copy relevant information from medical records in clinical log book (P3)	78

Learning Strategies, Contact Hours and Student Learning Time (SLT):			
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**	
Small group discussion (SGD)			
Case Based Learning (CBL)			
Clinic	66		
Practical			
Assessment	12		
Total	**78**		
Assessment Methods:			
Formative:			**Summative:**
Log book maintenance, Direct Observation of Procedural skills (DOPS)			
Mapping of Assessment with COs:			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Log book maintenance	x	x	x
DOPS			x
Feedback Process	End posting Feedback		

SEMESTER - V

COURSE CODE	:	COURSE TITLE
NEP3101	:	Neurosciences and Paediatrics
ORT3101	:	Orthopaedics
PTH3101	:	Theoretical concepts in Neurological Physiotherapy - I
PTH3131	:	Clinical Practice in Neurological Physiotherapy - I
PTH3102	:	Theoretical concepts in Musculoskeletal Physiotherapy - I
PTH3132	:	Clinical Practice in Musculoskeletal Physiotherapy - I
PTH3111	:	Neuromusculoskeletal skills - I
*** ****	:	Open Elective - II

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Neurosciences and Paediatrics**
Course Code	**NEP3101**
Academic Year	Third
Semester	V
Number of Credits	3
Course Prerequisite	Basic knowledge of Anatomy, Physiology, Pathology, Microbiology and Pharmacology
Course Synopsis	1. This course describes common neurological, neurosurgical conditions and medical management for the same 2. It also describes common paediatric conditions and its medical management

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Describe the etiology, clinical features, diagnosis and medical/surgical management for common neurological, neurosurgical and pediatric conditions (C2)
CO2	Outline the clinical aspects that need to be considered in occupational therapy / physiotherapy interventions, such as surgical procedures, prognosis, precautions, contraindications and complications (C2)

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

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

Course Content and Outcomes:

Content	Competencies	Number of Hours
NEUROLOGY		
Unit 1		
Stroke	1. Define stroke and list the types (C1) 2. List the risk factors, explain the features of various stroke syndromes (C2) 3. Outline the medical and surgical management of ischemic and hemorrhagic stroke (C2)	2
Unit 2		
Cranial nerve disorders	1. List the disorders of cranial nerves, its etiology and clinical features (C1) 2. Describe the medical management of cranial nerve disorders with emphasis on V, VII, IX and X (C2)	1
Unit 3		
Infections of nervous system	1. List the disorders arising due to infection of nervous system (C1)	1

Content	Competencies	Number of Hours
	2. Describe the clinical features, investigation findings and medical management of meningitis, encephalitis and AIDs (C2)	
Unit 4		
Demyelinating diseases of nervous system	1. List the disorders arising due to demyelination of brain and spinal cord (C1) 2. Classify myelin disorders (C2) 3. Describe the clinical features, diagnostic criteria, medical management of multiple sclerosis and optic neuritis (C2)	1
Unit 5		
Spinal Cord lesions	1. Describe the etiology, clinical features, diagnosis and medical/surgical management of transverse myelitis, and syringomyelia. (C2)	1
Unit 6		
Extrapyramidal syndromes	1. Outline the neurophysiology of basal ganglia (C2) 2. Describe the classification, Pathology, Clinical features, Medical management of Parkinson's disease (C2) 3. Outline the clinical features, and medical management of Wilson's disease, progressive supranuclear palsy, dystonias and dyskinesias (C2)	2
Unit 7		
Degenerative diseases	1. List the various degenerative diseases (C1) 2. Describe the types, clinical features, diagnostic criteria and medical management of motor neuron disease, dementia and alzheimer's disease (C2)	1
Unit 8		
Myasthenia gravis	1. Define myasthenia gravis (C1) 2. Describe the etiology, pathology and clinical features and diagnosis of myasthenia gravis (C2) 3. Classify myasthenia gravis (C2) (Osserman classification system) 4. Summarize the medical management of myasthenia gravis (C2)	1
Unit 9		
Polyneuropathy	1. Classify polyneuropathy(C2) 2. Describe the etiology, clinical features and medical management of Guillain barre syndrome, diabetic neuropathy, hereditary motor sensory neuropathy (C2)	1
Unit 10		
Myopathies and Muscular dystrophies	1. Classify myopathies and muscular dystrophies (C1) 2. Outline the features and management of myopathies and muscular dystrophies with emphasis to Duchene Muscular Dystrophy (C2)	1

Content	Competencies	Number of Hours
Unit 11		
Cerebellar disorders	1. Describe the etiology, clinical features of cerebellar disorders (C2) 2. List out the clinical tests (C1) 3. Describe the management of cerebellar disorders (C2)	1
NEUROSURGERY		
Unit 12		
Head injury	1. Outline the causes, types and mechanism of head injury. (C2) 2. Describe the features of concussion, diffuse axonal injury, epidural, subdural, subarachnoid and intracranial bleeding (C2) 3. Describe the investigatory findings, medical and surgical management of head injury (C2) 4. Outline the complications following head injury and its management (C2)	3
Unit 13		
Tumors of neurological system	1. Classify various brain and spinal tumors (C2) 2. Describe the differential diagnosis, clinical features, prognosis, medical and surgical management of brain and spinal tumors (C2)	2
Unit 14		
Spinal cord lesion	1. Describe the mechanism of injury and clinical features of spinal cord lesions (C2) 2. Describe the acute management and surgical procedures following spinal cord injury(C2) 3. List the common complications (C1) and its management following spinal cord injury (C2)	3
Unit 15		
Neurogenic bladder	1. Describe the classification and medical management of neurogenic bladder (C2)	1
Unit 16		
Paediatric conditions	1. Describe the types, clinical features, medical, and surgical management of hydrocephalus and spinal dysraphism. (C2)	1
Unit 17		
Peripheral nerve lesions	1. Classify peripheral nerve injuries. (C2) 2. Describe the features, medical and surgical management of the peripheral nerve injuries (C2)	1
Unit 18		
7.Cerebrovasular anomalies	1. Describe the features, complications and surgical management of cerebrovascular anomalies (C2)	2
PAEDIATRICS		
Unit 19		
Normal development and maturation	1. Outline the normal development and maturation. (C2)	1

Content	Competencies	Number of Hours
	2. Describe the factors influencing neurodevelopment (C2)	
Unit 20		
Developmental assessment and early intervention	1. Descibe the developmental assessment and early intervention (C2)	1
Unit 21		
Congenital and hereditary neuromuscular diseases	1. Describe the etiology, clinical features, diagnosis and medical management of muscular dystrophy (C2)	1
Unit 22		
Obstetric brachial plexus injury	1. Describe the etiology, clinical features, diagnosis and medical management of obstetric brachial plexus injury (C2)	1
Unit 23		
Mental Retardation and Down's Syndrome	1. Describe the etiopathology, clinical features and management of mental retardation and down's syndrome (C2)	1
Unit 24		
Malnutrition and Vitamin deficiencies	1. Outline the various conditions related to malnutrition and vitamin deficiencies and its management (C2)	1
Unit 25		
Cerebral Palsy	1. Describe the etiology, clinical features, diagnosis and medical management of cerebral palsy (C2)	1
Unit 26		
Spinal muscular atrophies	1. Describe the etiology, clinical features, diagnosis and medical management of spinal muscular atrophies (C2)	1
Unit 27		
Endocrinal disorders in children	1. Outline the various endocrinal disorders in children (C2) 2. Define childhood obesity (C1) 3. Describe the complications of childhood obesity(C2)	1
Unit 28		
Paediatric Respiratory conditions	1. Outline common pediatric respiratory diseases C2) 2. Describe the etiology, clinical features, diagnosis and medical management of asthma, tuberculosis, bronchiectasis and acute respiratory distress syndrome (C2)	1
Unit 29		
Intensive neonatal care	1. Describe the respiratory care, infectious diseases and long term complications in NICU and PICU (C2)	1

Content	Competencies	Number of Hours
Unit 30		
Congenital cardiovascular problems	1. Classify congenital heart disease (C2) 2. Describe the etiology, clinical features, diagnosis and medical management of rheumatic Fever, atrial septal defect, ventricular septal defect, tetralogy of fallot (C2)	1
Unit 31		
Juvenile Arthritis	1. Define juvenile arthritis (C1) 2. Describe the etiology, clinical features, diagnosis and medical management of juvenile arthritis (C2)	1

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	117
Seminar	--	
Small group discussion (SGD)	--	--
Self-directed learning (SDL)	--	--
Problem Based Learning (PBL)	--	--
Case Based Learning (CBL)	--	--
Clinic	--	--
Practical	--	--
Revision	--	--
Assessment	--	
Total	**39**	**117**

Assessment Methods:	
Formative:	**Summative:**
Quiz	Mid Semester/Sessional Exam (Theory)
--	End Semester Exam (Theory)

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

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Lindsay, K. W., Bone, I., Fuller, G., & Callander, R. (2010). Neurology and neurosurgery illustrated. Edinburgh: Churchill Livingstone 2. Ghai OP, Paul VK, Bagga A. (2013). Essential pediatrics. New Delhi: CBS Publishers.
Additional References	Colledge, N. R., Walker, B. R., Ralston, S., & Davidson, S. (2010). Davidson's principles and practice of medicine. Edinburgh: Churchill Livingstone/Elsevier.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Orthopaedics**
Course Code	**ORT3101**
Academic Year	Third
Semester	V
Number of Credits	2
Course Prerequisite	Basic knowledge in Anatomy, Physiology and Pathology
Course Synopsis	This module will enable the student to understand the • Aetiology, Clinical features, diagnosis, and surgical management of different types of traumatic and non-traumatic orthopaedics conditions. • Rationale and apply the gained knowledge to rehabilitate patients with diverse orthopaedics conditions.
Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain aetiology/mechanism, clinical features, investigations, diagnosis, conservative and surgical management of traumatic orthopaedics conditions (C2)
CO2	Explain aetiology/mechanism, clinical features, investigations, diagnosis, conservative and surgical management of non- traumatic orthopaedics conditions (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
A. TRAUMATOLOGY		
Unit 1		
Introduction to fractures	1. Define fracture (C1) 2. Classify fractures (C2) 3. Discuss phases of fracture healing (C2) 4. Explain the principles of fracture management (C2)	01
Unit 2		
Fracture Complications	1. Explain complications of fractures (Early, Delayed and Late) (C2) 2. Discuss management of complication (C2)	01

Content	Competencies	Number of Hours
Unit 3		
Injuries around the shoulder	1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain the Conservative and surgical management of Shoulder dislocation**/**Fracture; Fracture Clavicle (C2)	02
Unit 4		
Injuries around the elbow	1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain the Conservative and surgical management of supracondylar fracture of the humerus & its complications and dislocation of the elbow (C2)	01
Unit 5		
Injuries of the forearm	1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain the Conservative and surgical management of Monteggia and Galeazzi fracture dislocation (C2)	01
Unit 6		
Fractures of the wrist & hand	1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain Conservative and surgical management of Scaphoid, Colles', Smith's, Barton's fractures (C2)	01
Unit 7		
Peripheral nerve injuries (PNI), tendon injuries & Orthoses	*Peripheral nerve injuries* 1. Classify PNI (C2) 2. List clinical features of PNI (C1) 3. Explain conservative and surgical management of PNI (C2) *Tendon injuries* 1. List types & clinical features of (C1) 2. Explain conservative and surgical management of tendon injuries (C2) 3. Define Orthoses (C1) 4. List Upper limb and lower limb orthosis (C1) 5. Outline the application of Orthosis(C2)	02
Unit 8		
Soft tissue injuries of knee and ankle	*Meniscal injuries, Cruciate ligament injuries, Collateral injuries* 1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain conservative and surgical management(C2) *Ankle sprain*	01

Content	Competencies	Number of Hours
	1. List Ankle sprains (C1) 2. Explain conservative and surgical management (C2)	
Unit 9		
Arthroscopy of knee and shoulder	*Anterior Cruciate Ligament, Posterior Cruciate Ligament, Posterior Lateral Corner of the Knee & Meniscus* 1. Explain Reconstructive & Rehabilitative management (C2) *Rotator cuff and labral tears* 1. Explain Reconstructive & Rehabilitative management (C2)	01
Unit 10		
Fractures of lower extremity	*Shaft of femur, Supracondylar femur, Tibia plateau, tibia and fibula. ankle & foot* 1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain Conservative and surgical management (C2)	01
Unit 11		
Fracture of the proximal femur	*Neck of femur, Intertrochanteric and Sub-trochanteric* 1. Explain Mechanism (C2) 2. List clinical features (C1) 3. Explain conservative and surgical management management (C2)	01
Unit 12		
Pelvic fractures and hip dislocation	*1.* Classify (C2) 2. Discuss Mechanism (C2) 3. List clinical features (C1) 4. Explain Conservative and surgical management (C2)	01
Unit 13		
Fractures of the spine	*1.* Classify (C2) 2. Discuss Mechanism (C2) 3. List clinical features (C1) 4. Explain Conservative and surgical management management (C2) ***Paraplegia*** 1. Outline Aetiology (C2) 2. Define levels (C1) 3. List complications (C1) and explains clinical presentations(C2) 4. Explain Conservative and surgical management management (C2)	01

Content	Competencies	Number of Hours
B. COLD ORTHOPEDICS		
Unit 14		
Congenital anamolies	*CTEV, DDH, Vertical talus, MCC* 1. Outline Aetiology (C2) 2. List Clinical features (C1) 3. Explain Conservative and surgical management management (C2)	01
Unit 15		
Tumours	*1.* Classify (C2) 2. Outline Aetiology (C2) 3. List Clinical features (C1) 4. Explain Conservative and surgical management management (C2)	01
Unit 16		
Neuromuscular disorders	*Cerebral palsy, Poliomyelitis* 1. Outline Aetiology (C2) 2. Explain presentation (C2) 3. Explain Conservative and surgical management management (C2)	01
Unit 17		
Spinal disorders	*Disc prolapse, spinal canal stenosis, spondylolisthesis and non-specific backache* *1.* Define (C1) *2.* List stages (C2) 3. Outline Aetiology (C2) 4. List clinical features (C1) 5. Explain Conservative and surgical management management (C2)	01
Unit 18		
Infections	*Acute & chronic osteomyelitis, septic arthritis, tubercular arthritis* 1. Explain Aetiopathogenesis (C2) 2. List clinical features (C1) 3. Illustrate complications (C2) 4. Explain Conservative and surgical management management (C2)	01
Unit 19		
Arthitis	1. Define and classify arthritis (C1, C2) 2. Outline Aetiology (C2) 3. List clinical features (C1) 4. Explain Conservative and surgical management management of osteoarthritis, rheumatoid and haemophilic arthritis (C2)	02

Content	Competencies	Number of Hours
Unit 20		
Deformities	*Axial skeleton (Torticollis, scoliosis, kyphosis), Upper limbs (Cubitus valgus/varus, wrist and hand deformities), Lower limbs (Coxa vara infantile, adolescent, acquired; genu valgum/varum; torsional deformities, flat foot)* 1. Define (C1) 2. Explain Aetiology of each condition (C2) 3. List clinical features (C1) 4. Discuss Conservative and surgical management management (C2)	02
Unit 21		
Extremity Soft tissue lesions	*Periarthritis of the shoulder, supraspinatus tendinitis, tennis elbow, carpal tunnel, syndrome, trigger finger, DeQuervain's disease, Depuytren's contracture, plantar fasciitis:* 1. Define (C1) 2. Explain Aetiology of each condition (C2) 3. List clinical features (C1) 4. Discuss Conservative and surgical management management (C2)	01
Unit 22		
Amputation and Prostheses	1. List Levels & Indications of amputation (C1) 2. Explain rationale and Orthopaedic management (C2) 3. Define Prostheses (C1) 4. List Upper limb and lower limb Prostheses (C1) 5. Outline the application (C2)	01

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		52
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**52**

Assessment Methods:					
Formative:	**Summative:**				
Quiz	Mid Semester/Sessional Exam (Theory)				
	End Semester Examination (Theory)				
Mapping of Assessment with COs:					
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1		x	x		
Sessional Examination 2					
Quiz / Viva					
Assignments/Presentations					
Clinical/Practical Log Book/ Record Book					
Any others: WPBA					
End Semester Exam		x	x		
Feedback Process:	Mid-Semester Feedback End-Semester Feedback				
Main Reference:	1. Maheshwari J, Mhaskar VA. Essential Orthopaedics:(including Clinical Methods). JP Medical Ltd; 2019 Feb 28. 2. Solomon L, Warwick DJ, Nayagam S. Apley and solomon's concise system of orthopaedics and trauma. CRC Press; 2014 May 30.				
Additional References					

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Neurological Physiotherapy - I**
Course Code	**PTH3101**
Academic Year	Third
Semester	V
Number of Credits	3
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system and principles of exercise and electro therapy.
Course Synopsis	The module is designed to provide an overview to the students about the principles of evaluation and physiotherapy management for people with neurological dysfunctions following brain lesions.

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

CO1	Plan a comprehensive assessment for people with neurological dysfunction (C3)
CO2	Summarize typical neuromotor and cognitive development in children (C2)
CO3	Summarize the clinical features and complications of brain lesions and relate it to physiotherapy interventions (C2)
CO4	Select neurological physiotherapy approaches and treatment strategies based on evidence and plan physiotherapy treatment for the adults with neurological disorders following brain lesions (C3)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Neurological evaluation	1. Outline and explain the components of neurological evaluation in physiotherapy	2
Unit 2		
Normal neuromotor and cognitive development in Children	1. Summarize the typical neuromotor and cognitive development from birth to 5th year of life (C2) 2. Classify developmental reflexes(C2) 3. Explain the methods to elicit the neonatal and developmental reflexes. (C2) 4. Distinguish normal and abnormal neonatal reflexes (C4)	2

Content	Competencies	Number of Hours
Unit 3		
Approaches in neurological physiotherapy	1. Outline the principles and assumptions of the following approaches in neurological rehabilitation. (C2) 2. Roods, Bobath, Proprioceptive Neuromuscular Facilitation, Neuro Developmental Techniques (NDT), Sensory Integration, Motor Re-learning program (MRP) and Brunnstorm movement therapy, 3. Explain the steps and techniques of each approach. (C2) 4. Apply the principles of approaches in the rehabilitation of people with neurological dysfunctions. (C3)	5
Contemporary treatment techniques in neurological rehabilitation	1. Outline the indications, concept/rationale, mechanism and procedure for following contemporary treatment techniques in neurological rehabilitation (C2) 2. Functional Electrical Stimulation(FES), Body Weight Support Treadmill Training (BWSTT), Constraint Induced Movement Therapy (CIMT), Mirror therapy, Mental imagery and Virtual reality 3. List the advantages and disadvantages of each treatment technique (C1)	2
Unit 4		
Stroke	1. Define Stroke (C1) 2. List the causes, risk factors and clinical features of stroke and stroke syndromes (C1) 3. Summarize the physiotherapy evaluation findings of people with stroke (C2) 4. Plan and explain physiotherapy management in acute, subacute and chronic stages of stroke recovery (C3) 5. Select physiotherapy techniques based on evidence for management of people with stroke (C3)	10
Unit 5		
Traumatic Brain Injury	1. Summarize the features and sequelae following traumatic brain injury (C2) 2. Outline physiotherapy evaluation findings in people with Traumatic brain injury (C2) 3. Plan the physiotherapy management for conscious and unconscious individuals following traumatic brain injury (C3)	8
Unit 6		
Physiotherapy in Cerebellar Disorders:	1. Summarize the causes and pathophysiology for cerebellar disorders (C2) 2. Plan physiotherapy assessment and management of cerebellar disorders with	2

Content	Competencies	Number of Hours
	emphasis on improving balance, coordination, posture and gait (C3)	
Unit 7		
Extrapyramidal diseases	1. Outline physiotherapy evaluation findings in patients with Parkinson disease (C2) 2. Compare and contrast Parkinson's disease with other extrapyramidal disorders based on clinical features (C2) 3. Plan physiotherapy management and strategies for people with Parkinson Disease and Parkinson plus syndromes (C3)	4
Unit 8		
Multiple Sclerosis:	1. Summarize the types and features of Multiple sclerosis (C2) 2. Plan the physiotherapy assessment and management for persons with Multiple sclerosis (C3)	2
Unit 9		
Brain Tumor Rehabilitation	1. Outline the clinical features, medical and surgical management following brain tumors (C2) 2. Plan physiotherapy management for a patient with brain tumour following surgery or radiation therapy or chemotherapy (C3)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	3	6
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	39	88
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
End Semester Exam	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Bickerstaff's Neurological Examination in Clinical Practice (7th Adapted Edition- Kameshwar Prasad, Ravi Yadav , John Spillane. Wiley 2. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmitz 3. Umphred's Neurological Rehabilitation- 6th Edition 4. Suzan Campbell et al. Physical Therapy for Children, 4th Edition. 2011. Saunders. 5. Tecklin JS. Pediatric Physical Therapy. 5th Edition. 2014. Lippincott Williams & Wilkins
Additional References	1. DeJong's The neurologic examination. 8th Edition. William W Campbell 2. Neurology and Neurosurgery Illustrated. 5th Edition. Kenneth W. Lindsay, Ian Bone, Geraint Fuller

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Neurological Physiotherapy - I**
Course Code	**PTH3131**
Academic Year	Third
Semester	V
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system, and basic exercise, electrotherapy skills and theoretical concepts in neurological physiotherapy
Course Synopsis	The module will provide clinical knowledge and skills on the physiotherapy evaluation and management of people with neurological disorders.

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

CO1	Choose and perform physiotherapy assessment techniques in people with neurological disorders (C2, P4, A3)
CO2	Develop a comprehensive plan and perform treatment techniques under supervision in people with neurological disorders (C3, P4, A3)
CO3	Explain in verbal and written form with patients, caregivers, peers and health care professionals and supports as team member (C2, P2, A3)
CO4	Display ethical practice and professional etiquette during assessment and treatment of people with neurological disorders (P3, 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 adults and children with neurological disorders	1. Choose and perform assessment techniques including history taking, observation, higher mental functions, cranial nerves, sensory system, motor system, reflexes, coordination, balance, gait and functional evaluation in people with neurological disorders (C3, P4,A2) 2. Interpret the report of the relevant investigations of people with neurological dysfunctions (C2) 3. Identifies oneself as a team member and discusses health related information with clients, caregivers, peers and professionals	78

Content	Competencies	Number of Hours
	(A2) 4. Display professional etiquettes during interaction with clients, caregivers and professionals (P3, A2)	
Unit 2:		
Physiotherapy management in following neurological conditions • Stroke • Traumatic Brain Injury • Cerebellar disorders, • Extrapyramidal disorders • Multiple Sclerosis • Brain tumors	1. Organize the problem list based on ICF format (C3) 2. Plan short term and long-term goals using SMART goal approach based on the evaluation findings (C3. A3) 3. Perform treatment techniques for people with neurological disorders under supervision (C3, P4, A3)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):					
Learning Strategies	**Contact Hours**		**Student Learning Time (SLT)**		
Small group discussion (SGD)					
Case Based Learning (CBL)	13		26		
Clinic	52		26		
Practical					
Assessment	13		26		
Total	**78**		**78**		
Assessment Methods:					
Formative:	**Summative:**				
Logbook maintenance, Case presentation, OSCE, DOPS and Clinical competency assessment	Sessional Exam (Viva-voce and Practical)				
Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	
Logbook	x	x			
Case presentation	x	x	X	x	
DOPS	x	x			
Clinical competency assessment	x	x	x	x	
Sessional Examination	x	x		x	
Feedback Process	Sessional examination Feedback				
Main References	1. Bickerstaff's Neurological Examination in Clinical Practice (7th Adapted Edition- Kameshwar Prasad, Ravi Yadav , John Spillane. Wiley 2. Physical Rehabilitation (5th Edition)- Susan O				

	Sullivan &Thomas J Schmitz 3. Umphred's Neurological Rehabilitation- 6th Edition 4. Suzan Campbell et al. Physical Therapy for Children, 4th Edition. 2011. Saunders. 5. Tecklin JS. Pediatric Physical Therapy. 5th Edition. 2014. Lippincott Williams & Wilkins
Additional References	1. DeJong's The neurologic examination. 8th Edition. William W Campbell 2. Neurology and Neurosurgery Illustrated. 5th Edition. Kenneth W. Lindsay, Ian Bone, Geraint Fuller

Manipal College of Health Professions								
Name of the Department	Physiotherapy							
Name of the Program	Bachelor of Physiotherapy							
Course Title	**Theoretical concepts in Musculoskeletal Physiotherapy - I**							
Course Code	**PTH3102**							
Academic Year	Third							
Semester	V							
Number of Credits	3							
Course Prerequisite	Basic knowledge of applied anatomy, physiology of musculoskeletal system and principles of electrophysical modalities and exercise therapy							
Course Synopsis	This course will help to plan contemporary physiotherapy management strategies for the traumatic, degenerative, inflammatory, congenital conditions, nerve injuries and post-surgical musculoskeletal conditions.							
Course Outcomes (COs): At the end of the course student shall be able to:								
CO1	Identifies and applies the mechanisms of injuries, clinical features, management options, and prognosis of traumatic, arthritic, post-surgical, and congenital musculoskeletal conditions and peripheral nerve injuries (C3)							
CO2	Plans safe and competent management goals and comprehensive physiotherapy intervention based on the musculoskeletal condition (C3)							
CO3	Applies clinical reasoning and evidence-based practice into physiotherapy management strategies for musculoskeletal conditions (C3)							
CO4								
CO5								
Mapping of Course Outcomes (COs) to Program Outcomes (POs):								
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x							
CO3	x					x		

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Musculoskeletal physiotherapy examination	1. Outline and explain the components of Musculoskeletal examination (C2)	03
Unit 2		
Fractures of upper limb, lower limb, and spine	1. Define and classify fracture (C2) 2. Summarise the clinical features and complications of fractures (C2) 3. Outline the orthopaedic management including orthotic usage (C2) 4. Plan the physiotherapy management	12

Content	Competencies	Number of Hours
	strategies based on the phase of healing and physical examination (C3)	
Unit 3		
Joint dislocations	1. Define and classify Dislocation (C2) 2. Summarize the mechanisms, clinical features, and complications of dislocation with emphasis to shoulder, hip, patella, elbow (C2) 3. Outlines the orthopedic management (C2) 4. Plan the physiotherapy management strategies based on the phase of healing and physical examination (C3)	04
Unit 4		
Arthritis	1. Define and classify arthritis (C2) 2. Explain the pathophysiology, clinical features, and diagnostic criteria for arthritis (C2,) 3. Plan evidence-based physiotherapy management strategies based on the physical examination with emphasis to degenerative, seronegative, and seropositive arthritis (C3)	05
Unit 5		
Orthopaedic surgeries & post-surgical rehabilitation	1. List the indications for arthroplasty, arthroscopy, arthrodesis, osteotomy, and surgeries in cerebral palsy. (C1) 2. Plan the physiotherapy management based on the surgical procedure (C3)	07
Unit 6		
Peripheral Nerve Injuries (PNI)	1. Recall the anatomy of brachial plexus and nerve course (C1) 2. Recall classification of nerve injuries (C1) 3. Explain the mechanisms and list the complications of PNI (C2) 4. Plan physiotherapy management strategies based on physical examination in conservative and surgically managed nerve injuries (C3)	05
Unit 7		
Physiotherapy in Developmental dislocation of hip, Perthes disease, Congenital Talipes Equino Varus, Club hand	1. List the causes and clinical features of Developmental dislocation of hip, Perthes disease, Congenital Talipes Equino Varus, and Club hand (C1) 2. Plan the physiotherapy management strategies based on the type of congenital deformity and physical examination (C3)	03

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	03	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**72**

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**	**CO5**
Mid Semester / Sessional Examination 1	x	x	x		
Presentations	x	x			
End Semester Exam	x	x	x		

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Treatment and Rehabilitation of Fractures 1st Edition by Stanley Hoppenfeld MD 2. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach, 3rd Edition By S. Brent Brotzman 3. Walker JM, editor. Physical rehabilitation in arthritis. WB Saunders Company; 2004.
Additional References	1. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmit 2. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)) Fourth Edition by Darlene Hertling BS RPT

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Musculoskeletal Physiotherapy - I**
Course Code	**PTH3132**
Academic Year	Third
Semester	V
Number of Credits	2
Course Prerequisite	Basic knowledge of applied anatomy, physiology of musculoskeletal system, principles of electro-physical modalities and exercise therapy and theoretical concepts in musculoskeletal physiotherapy
Course Synopsis	The module will provide clinical knowledge and skills in the physiotherapy evaluation and management of people with musculoskeletal conditions

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

CO1	Choose and perform physiotherapy assessment techniques in the examination in people with musculoskeletal disorders (C2, P4, A3)
CO2	Develop a comprehensive plan and perform treatment techniques under supervision in people with musculoskeletal disorders (C3, P4, A3)
CO3	Explain in verbal and written form with patient, caregivers, peers and health care professional and supports as a team member (C2, P2, A3)
CO4	Displays ethical practice and professional etiquette during assessment and treatment of people with musculoskeletal disorders (P3, 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		
Musculoskeletal physiotherapy examination	1. Perform and organise subjective examination (C3, P4, A2) 2. Plan and detect findings on observation (C3, P1) 3. Perform various assessment procedures including movement examination consisting of ROM Assessment, Muscle strength evaluation (MMT), muscle length evaluation, joint play testing, neurological examination /screening (dermatome, myotome, and reflexes), and palpation, diagnostic orthopaedic tests (P4, A2) 4. Interpret the reports of the relevant investigations	

Content	Competencies	Number of Hours
	with respect to musculoskeletal conditions (C2) 5. Identifies oneself as a team member and discusses health related information with clients, caregivers, peers, and health care professionals (A2) 6. Display professional etiquettes during interactions with client's caregiver and professionals (P3, A2)	
Unit 2		
Physiotherapy management in arthritis, post-traumatic and elective surgical conditions	1. Organise the problem list based on ICF format (C3) 2. Plan short term and long terms goals using SMART goal approach (C3, A3) 3. Perform physiotherapy treatment techniques for musculoskeletal conditions under supervision (C3, P4, A3)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)	13	26
Clinic	52	26
Practical		
Revision		
Assessment	13	26
Total	**78**	**78**

Assessment Methods:	
Formative:	**Summative:**
Logbook maintenance, case presentation, DOPS and clinical competency assessment	Sessional Exam (Viva-voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Logbook	x	x			
Case Presentation	x	x	x	x	
DOPS	x	x			
Clinical competency assessment	x	x	x	x	
Sessional examination	x	x	x	x	

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25. 2. Treatment and Rehabilitation of Fractures 1st

	Edition by Stanley Hoppenfeld MD 3. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach, 3rd Edition By S. Brent Brotzman 4. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)) Fourth Edition by Darlene Hertling BS RPT 5. Kisner C, Colby LA, Borstad J. Therapeutic exercise: foundations and techniques. Fa Davis; 2017 Oct 18.
Additional References	1. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmit

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Neuromusculoskeletal skills - I**
Course Code	**PTH3111**
Academic Year	Third
Semester	V
Number of Credits	2
Course Prerequisite	Student should have knowledge on applied anatomy and physiology of neuromusculoskeletal system, and basic exercise and electrotherapy skills
Course Synopsis	The module will provide training on clinical therapeutic skills through hands on practice on peers in the evaluation and management of people with neurological and musculoskeletal disorders.

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

CO1	Display communication skills for patient interview (P3, C2, A2)
CO2	Perform skills of physiotherapeutic assessment and therapeutic techniques in a simulated environment (P3, C2, A2)
CO3	Explain the rationale for procedural steps of physiotherapeutic assessment and therapeutic techniques in neurological and musculoskeletal conditions (P2, C2)

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		
Physiotherapy neurological Assessment:	1. Display the assessment techniques involved in neuro-physiotherapy evaluation including history taking, observation, Higher Mental Functions, cranial nerves, sensory system, motor system, reflexes, coordination, balance, gait and functional evaluation (P3)	16
Unit 2		
Pediatric neurological examination including development and reflexes	1. Display the assessment methods involved in paediatrics –history taking, observation, Higher Mental Functions, cranial nerves, sensory system, motor system, reflexes, coordination, balance, gait and functional evaluation (C2, P3) 2. Display and explain the positions to elicit the	4

Content	Competencies	Number of Hours
	neonatal reflex. (C2, P3)	
Unit 3		
Neurological approaches	1. Explain the steps and techniques in neurological approaches (P2)	6
Unit 4		
Physiotherapy musculoskeletal Assessment	1. Display and perform the assessment techniques involved in musculoskeletal-physiotherapy evaluation including history taking, pain assessment, observation, movement examination and palpation (C2, P3)	4
Unit 5		
Examination of peripheral joints (shoulder, elbow, knee, ankle)	1. Display and perform joint specific evaluation skills including movement examination, muscle length, and diagnostic orthopedic tests (C2, P3)	22

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	52	26
Revision		
Assessment		
Total	**52**	**26**

Assessment Methods:	
Formative:	**Summative:**
OSCE/OSPE	Mid Semester/Sessional Exam (OSCE/OSPE/Practical)

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

Feedback Process	Mid-Semester Feedback
Main References	1. Communication skills for health professionals - Philip Burnard 2nd Ed 2. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25. 3. Tecklin JS, editor. Pediatric physical therapy. Lippincott Williams & Wilkins; 2008. 4. Spillane J. Bickerstaff's neurological examination in

	clinical practice. John Wiley & Sons; 2008 Jan 19. 5. Lindsay KW, Bone I, Fuller G. Neurology and neurosurgery illustrated e-book. Elsevier Health Sciences; 2010 Sep 9.
Additional References	1. Dejong's The Neurologic Examinations South Asian Edition 2020 By Campbell, Lakshami Narasimhan 2. Occupational Therapy for Physical Dysfunction Seventh Edition Seventh, North American Edition- Mary Vining Radomski, Catherine A. Trombly 3. Cash's Textbook of Neurology for Physiotherapist (4th Edition) – P A Downie 4. Physiotherapy in Neuro-conditions- Glady Samuel 5. llingworths Development of the Infant and the Young Child 10th Edition 2012 By Ronald S Illingworth

SEMESTER - VI

Course code	:	Course Title
BST3201	:	Biostatistics and Research Methodology
MED3201	:	General Medicine
PTH3201	:	Theoretical concepts in Neurological Physiotherapy - II
PTH3231	:	Clinical Practice in Neurological Physiotherapy - II
PTH3202	:	Theoretical concepts in Musculoskeletal Physiotherapy - II
PTH3232	:	Clinical Practice in Musculoskeletal Physiotherapy - II
PTH3211	:	Neuromusculoskeletal skills - II
PTH****	:	Program Elective - I

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Biostatistics and Research Methodology**
Course Code	**BST3201**
Academic Year	Third
Semester	VI
Number of Credits	3
Course Prerequisite	Nil
Course Synopsis	1. To provide necessary foundation on • Introductory level biostatistics • Demography, vital statistics and epidemiology • Survey sampling methods • Fertility, morbidity, and mortality indices 2. To introduce the steps involved in research process

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain characteristics of statistical data, types of variables, scales of measurement, presentation of data, normal distribution. (C2)
CO2	Apply measures of location and variation for statistical data (C3)
CO3	Outline the sources of demographic data and vital statistics, merits and demerits of probability and non-probability sampling techniques. (C2)
CO4	Explain the indices of fertility, morbidity and mortality, Epidemiology, observational study designs (C2)
CO5	Explain the concept of correlation and regression. (C2)
CO6	Summarize the steps involved in a research process (C2)

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

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x							
CO3	x							
CO4		x						
CO5	x							
CO6	x							

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Introduction to Biostatistics	• Define biostatistics (C1) • Describe the characteristics of statistical data (C2) • Explain the role of statistics in health sciences (C2)	2
Variables	• Distinguish between qualitative & quantitative with appropriate examples (C2)	4

Content	Competencies	Number of Hours
	• Distinguish between continuous & discrete variables with appropriate examples (C2) • Distinguish between nominal & ordinal variables with appropriate examples (C2)	
Scales of Measurement	• Describe nominal scale of measurement of variables with appropriate examples (C2) • Describe ordinal scale of measurement of variables with appropriate examples (C2) • Describe interval scale of measurement of variables with appropriate examples (C2) • Describe ratio scale of measurement of variables with appropriate examples (C2)	4
Unit 2:		
Tabular presentation of data	• Describe the three types of class intervals – inclusive, exclusive and open ended (C2) • Explain the concepts of relative and cumulative frequencies (C2) • Construct the frequency table (C3)	2
Graphical presentation of data	• Explain the concepts of Histogram, Frequency Polygon, Frequency Curve (C2) • Construct Histogram, Frequency Polygon, Frequency Curve for statistical data (C3)	2
Diagrammatic presentation of data	• Explain the concepts of Bar diagram and Pie diagram (C2) • Construct Bar diagram and Pie diagram for statistical data (C3)	2
Unit 3:		
Measures of Location	• Explain the concepts of Mean, Median, Mode (C2) • Explain the concepts of Quartiles and Percentiles (C2)	2
Unit 4:		
Measures of Variation	• Describe the concepts of Range, Inter-quartile range, Variance, Standard deviation and Coefficient of variation (C2)	2
Unit 5:		
Sampling	• Explain sampling and non-sampling error (C2) • Define and distinguish probability and non-probability sampling methods (C1) • Explain each sampling technique by stating their merits and demerits (C2)	4
Unit 6:		
Normal Distribution	• Explain the characteristics of normal distribution (C2) • Compute the area under the normal distribution curve (C3)	2
Skewness and Kurtosis	• Explain the concept of skewness and describe three types of skewness (C2)	2

Content	Competencies	Number of Hours
	• Explain the concept of kurtosis and describe three types of kurtosis (C2)	
Unit 7:		
Correlation	• Define correlation (C2) • Explain positive and negative correlation with appropriate examples (C2) • Explain the Pearson's correlation coefficient and outline its properties (C2) • Explain the Spearman's correlation coefficient and outline its properties (C2) • Illustrate using scatter plot the different types of correlation (C3)	2
Regression	• Distinguish between dependent and independent variables. (C2) • Explain the simple linear regression model along with the assumptions involved. (C2) • Identify the slope and intercept coefficient from the model. (C2) • Predict the dependent variable from the model for a given set of independent variables. (C3)	2
Unit 8:		
Demography and Vital statistics	• Define Demography and Vital statistics (C1) • What are the sources of demographic data and vital statistics (C1) • Define and distinguish rate, ratio and proportion (C1)	2
Morbidity, mortality and fertility rates	• Explain prevalence and incidence (C2) • Explain each measure of morbidity, mortality and fertility rates by stating the formula (C2)	4
Unit 9:		
Research	• Explain sampling and non-sampling error (C2) • Define and distinguish probability and non-probability sampling methods (C1) • Explain each sampling technique by stating their merits and demerits (C2)	3
Unit 10:		
Epidemiology	• Define Epidemiology (C1) • Explain the observational study designs (case report, case series, cross-sectional, ecological) (C2)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	45	135
Seminar	-	-
Small group discussion (SGD)	-	-
Self-directed learning (SDL)	-	-

Problem Based Learning (PBL)	-	-
Case Based Learning (CBL)	-	-
Clinic	-	-
Practical	-	-
Revision	-	-
Assessment	-	-
Total	**45**	**135**

Assessment Methods:

Formative:	**Summative:**
Unit Test	Mid Semester/Sessional Exam II (Theory)
End Semester Exam (Theory)	

Mapping of Assessment with COs:

Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x				
End Semester Exam	x	x	x	x	x	x

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Lwanga SK, Tye CY, Ayeni O. Teaching health statistics: lesson and seminar outlines. World Health Organization, Marketing and Dissemination, 1211 Geneva 27, Switzerland; 1999. 2. Health research methodology: a guide for training in research methods. World Health Organization; 2001. 3. Bonita R, Beaglehole R, Kjellström T. Basic epidemiology. World Health Organization; 2006. 4. Campbell MJ, Swinscow TD. Statistics at square one. John Wiley & Sons; 2011.
Additional References	5. Degu G, Tessema F. Biostatistics [Internet]. Gondor: University of Gondar; January 2005. Available from: http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/ln_biostat_hss_final.pdf 6. Kebede Y. Epidemiology [Internet]. Gondor: University of Gondar; 2004. Available from: http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_occupational_health_stud ents/Epidemiology.pdf 7. Degu G, Yigzaw T. Research Methodology [Internet]. Gondor: University of Gondar; 2006. Available from: http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/ln_research_method_final.pdf 8. Morris JN. Uses of epidemiology. Edinburgh, UK: Churchill Livingstone; 1975. 9. Campbell MJ, Machin D, Walters SJ. Medical statistics: a textbook for the health sciences. John Wiley & Sons; 2010. 10. Rao PS, Richard J. An Introduction to Biostatistics: A manual for students in health sciences. Prentice/Hall of India; 1996. 11. Mahajan BK, Khanal AB. Methods in biostatistics: for medical students and research workers. Jaypee Brothers Medical Publishers; 2010.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**General Medicine**
Course Code	**MED3201**
Academic Year	Third
Semester	VI
Number of Credits	3
Course Prerequisite	Basic knowledge of anatomy, physiology, biochemistry, pathology, microbiology and pharmacology
Course Synopsis	This module provides the student an opportunity to learn about different medical conditions in the field of general medicine, dermatology and rheumatology, in order to rationalize and apply the knowledge gained about various medical conditions in the clinical setup.

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

CO1	Explain the pathophysiology of various medical conditions (C2)
CO2	Explain the clinical features and management of various medical conditions (C2)
CO3	Outline the clinical assessment of cardiovascular and respiratory systems (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
GENERAL MEDICINE		
Unit 1		
Infections	1. Define infection (C1) 2. List the clinical features of infection (C1) 3. Outline the investigations (C2) 4. Explain the management and complications of bacterial (streptococcus, staphylococcus aureus) and viral (HIV, Hepatitis A, B, C, herpes simplex) infections (C2) 5. Recall the Universal precautions in ICU (Infection control) (C1)	2
Unit 2		
Poisoning	1. Explain causes and stages of organophosphorus poisoning (C2) 2. Recall types of snake bite (C1) 3. List the clinical manifestations and medical management (C1)	1

Content	Competencies	Number of Hours
Unit 3		
Diseases of blood	1. Classify blood disorders (C2) 2. Explain management of Anemia, thalassemia, leukemia, thrombocytopenia, hemophilia and thrombosis (C2)	1
Unit 4		
Nutritional deficiency diseases in adults:	1. Explain the causes, clinical features and management of vitamin deficiencies – B complex, A C and D deficiency (C1)	1
Unit 5		
Endocrine diseases	1. Classify endocrine disorders (C2) 2. List clinical features and management of Hypo and hyper pituitary, thyroid and adrenocortical disease (C2)	1
Unit 6		
Metabolic diseases	1. Define Diabetes Mellitus (C1) 2. Classify Diabetes Mellitus (C2) 3. List the clinical features of Diabetes Mellitus (C2) 4. List down the management of diabetes milletus and complication of diabetes 5. Outline the diagnosis and management of Dyslipidemia and obesity (C1)	2
Unit 7		
Lymph related disorders	1. Define Lymphedema (C1) 2. Outline the etiology of Lymphedema (C2) 3. List the clinical features of Filariasis (C1) 4. Outline the management of lymphadema	1
Unit 8		
Diseases of the digestive system and its management	1. Explain the causes, clinical features and management of Gastro-oesophageal reflux disease (C1) 2. Explain the causes, clinical features and management of Crohn's diseases(C2) 3. Explain the causes, clinical features and management of Jaundice (C2) 4. Outline etiology, clinical features, management and complications of Cirrhosis (C2)	1
RHEUMATOLOGY		
Unit 9		
Rheumatoid arthritis, Felty's Syndrome and Juvenile RA	1. Define Rheumatoid arthritis, perthes disease, Felty's syndrome, and Juvenile RA (C1) 2. Explain the etiology of perthes disease, Rheumatoid arthritis, Felty's syndrome, and Juvenile RA (C2) 3. Outline the clinical features and management of perthes disease, Felty's syndrome, and Juvenile RA (C2)	1

Content	Competencies	Number of Hours
Unit 10		
Systemic Lupus Erythematosus (SLE)	1. Define Systemic Lupus Erythematous (C1) 2. Explain the etiology of Systemic Lupus Erythematous (C2) 3. Outline the clinical features and management of Systemic Lupus Erythematous (C2)	**1**
Unit 11		
Spondyloarthropathies and Ankylosing Spondylitis	1. Define spondyloarthropathies and Ankylosing Spondylitis (C1) 2. Explain the etiology of Spondyloarthropathies and Ankylosing spondylitis (C2) 3. Outline the clinical features and management of Spondyloarthropathies and Ankylosing spondylitis (C2)	1
Unit 12		
Psoriatic Arthritis, Reiter's Syndrome and Enteropathic Arthritis, Osteoarthritis	1. Define Psoriatic Arthritis, Reiter's Syndrome and Enteropathic Arthritis (C1) 2. Explain the etiology of Psoriatic Arthritis, Reiter's Syndrome and Enteropathic Arthritis (C2) 3. Outline the clinical features and management of Psoriatic Arthritis, Reiter's Syndrome and Enteropathic Arthritis (C2)	1
Unit 13		
Gout and Pseudo gout	1. Define Gout and Psuedo gout (C1) 2. Explain the etiology of gout and pseudogout (C2) 3. Outline the clinical features and management of gout and pseudo gout (C2)	1
Unit 14		
Septic Arthritis, Polymyositis and Dermatomyositis	1. Define Septic Arthritis, Polymyositis and Dermatomyositis (C1) 2. Explain the etiology of Septic Arthritis, Polymyositis and Dermatomyositis (C1) 3. Outline the clinical features and management of Septic Arthritis, Polymyositis and Dermatomyositis (C2)	1
Unit 15		
Sarcoidosis and Sjogren's Syndrome	1. Define Sarcoidosis and Sjogren's Syndrome (C1) 2. Explain the etiology of Sarcoidosis and Sjogren's Syndrome (C2) 3. Outline the clinical features and management of Sarcoidosis and Sjogren's Syndrome (C2)	1
Unit 16		
Calcium Metabolism, Tetany / Osteomalacia / Osteoporosis	1. Define Calcium Metabolism, Tetany / Osteomalacia / Osteoporosis (C1) 2. Explain the etiology of Calcium Metabolism, Tetany / Osteomalacia / Osteoporosis (C2) 3. Outline the clinical features and management of Calcium Metabolism, Tetany / Osteomalacia / Osteoporosis (C2)	1

Content	Competencies	Number of Hours
CARDIO-RESPIRATORY CONDITIONS		
Unit 17		
Cardiac Evaluation	1. Explain the clinical assessment of Cardiovascular system(C2) 2. Outline ECG, Echo, Treadmill test and other investigations (C2)	1
Unit 18		
Cardiovascular diseases	1. Explain etiological classification, symptoms, sequel, chest radiograph findings, ECG, Complications, exercise limitations and medical management in case of (C2): • Coronary artery diseases- • Angina and Myocardial infarction • Congestive cardiac failure • Rheumatic fever and its complications • Valvular heart diseases 2. Classify congenital heart diseases (C2) 3. Outline the clinical presentation of common disorders such as acynotic shunts and Tetrology of Fallot (C2)	4
Unit 19		
Hypertension	1. Define hypertension (C1) 2. Classify hypertension (C2) 3. Outline the medical management of hypertension (C2)	1
Unit 20		
Peripheral vascular diseases	1. List the medical management of peripheral vascular diseases, arterial and venous thromboembolism and peripheral arterial obstructive disease (C1)	1
Unit 21		
Medical conditions in critical care	1. Define ARDS, Tetanus, Pulmonary Embolism and Shock (C1) 2. Explain the etiology of ARDS, Tetanus, Pulmonary Embolism and Shock (C2) 3. Outline the clinical features and management of ARDS, Tetanus, Pulmonary Embolism and Shock (C2)	2
DERMATOLOGY		
Unit 22		
Diseases of the Skin- Leprosy, Trophic Ulcers, and Psoriasis	1. Define Leprosy, Trophic ulcers and Psoriasis (C1) 2. Explain the etiology of Leprosy, Trophic ulcers and Psoriasis (C2) 3. Outline the clinical features and management of Leprosy, Trophic ulcers and Psoriasis (C2)	1

Content	Competencies	Number of Hours
PULMONARY MEDICINE		
Unit 23		
Introduction to Pulmonary diseases	1. Outline the clinical manifestations and clinical assessment of pulmonary diseases (C2)	2
Unit 24		
Investigations in Pulmonology	1. Discuss the Chest radiographs, ABG analysis, PFT and Bronchoscopy (C3)	2
Unit 25		
Infective lung conditions- Pulmonary Tuberculosis, Pneumonia and Lung abscess	1. Define Pulmonary Tuberculosis, Pneumonia and Lung abscess (C1) 2. Explain the etiology of Pulmonary Tuberculosis, Pneumonia and Lung abscess (C2) 3. Outline the clinical features and management of Pulmonary Tuberculosis, Pneumonia and Lung abscess (C2)	2
Unit 26		
Obstructive lung conditions	1. Define Bronchial Asthma, COPD and Bronchiectasis (C1) 2. Explain the etiology of Bronchial Asthma, COPD (C2) 3. Outline the clinical features and management of Pulmonary Tuberculosis, Pneumonia and Lung abscess (C2)	3
Unit 27		
Restrictive lung Diseases-Interstitial Lung Diseases and Pleural Diseases (Pneumothorax, Emphysema and Pleural Effusion)	1. Define Interstitial Lung Diseases and Pleural Diseases (Pneumothorax, Emphysema and Pleural Effusion), chest wall and neuromuscular diseases causing restrictive lung disease (C1) 2. Explain the etiology of Interstitial Lung Diseases and Pleural Diseases (Pneumothorax, Emphysema and Pleural Effusion) chest wall and neuromuscular diseases causing restrictive lung disease (C2) 3. Outline the clinical features and management of Interstitial Lung Diseases and Pleural Diseases (Pneumothorax, Emphysema and Pleural Effusion), chest wall and neuromuscular diseases causing restrictive lung disease (C2)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	78
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		

Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**78**

Assessment Methods:	
Formative:	**Summative:**
Quiz	Mid Semester Examination (Theory)
	End Semester Examination (Theory)

Mapping of Assessment with COs:

Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x	x			
End Semester Exam	x	x	x			

Feedback Process:	Mid-Semester Feedback End-Semester Feedback
Main Reference:	1. Pre Manual For Undergraduates K. George Mathew, Praveen Aggarwal 2. Davidson‟s Principles and practice of Medicine 22nd edition 3. Golwalla – Medicine For Students Aspi Golwalla & Sharukh A Golwalla
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Neurological Physiotherapy - II**
Course Code	**PTH3201**
Academic Year	Third
Semester	VI
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system, clinical aspects of neurological disorders and basic physiotherapeutic skills
Course Synopsis	This module will enable the students to understand the principles of physiotherapy management for the people with neurological dysfunctions involving spinal cord, motor neurons, cranial nerves and lower motor neurons. The module also provides knowledge to students on physiotherapy management in children with cerebral palsy and other developmental disorders.

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

CO1	Explain the features of childhood neurodevelopmental disorders and relate it to physiotherapy interventions (C2)
CO2	Plan physiotherapy treatment for children with neurodevelopmental disorders (C3)
CO3	Explain the features and complication of neurological disorders following spinal, peripheral or cranial nerve and muscle lesions and relate it to physiotherapy interventions (C2)
CO4	Plan physiotherapy treatment for the persons with following Spinal, peripheral or cranial nerve and muscle lesions (C3)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Cerebral Palsy	1. Define cerebral palsy(C1) 2. List the etiological factors of Cerebral palsy (C2) 3. Classify cerebral palsy according to topographical, physiological and functional classification(C2) 4. Summarize the clinical features of individual types of cerebral palsy(C2) 5. Outline the physiotherapy evaluation findings	6

Content	Competencies	Number of Hours
	(musculoskeletal, neuromotor, sensory perceptual) in children with cerebral palsy.(C2) 6. Explain the principles of physiotherapy management for children with Cerebral palsy. (C2)	
Unit 2		
Down Syndrome	1. Define Down Syndrome and Mental Retardation (C1) 2. List the classification of Intelligence (C1) 3. Summarize the clinical features of Down syndrome (C2) 4. Outline the antenatal investigations to screen Down syndrome (C2) 5. Plan the physiotherapy assessment and management for Down syndrome (C3)	1
Unit 3		
Developmental Disorders of the Nervous System:	1. Outline the embryonic development of neural tube and related structures. (C2) 2. Recall classification and features of spinal dysraphism (C1) 3. List the antenatal investigations to screen spinal dysraphism. (C2) 4. Plan physiotherapy assessment and management for spinal dysraphism (C3)	1
Unit 4		
3. Obstetric Brachial Plexus Palsy (OBPP)	1. Recall the anatomical structure of brachial plexus and its innervation (C1) 2. Outline the causes and clinical features of OBPP (C2) 3. Plan the physiotherapy assessment and management in OBPP (C3)	1
Unit 5		
Myopathies and Muscular Dystrophy:	1. Summarise the types, features and medical management of myopathies and muscular dystrophies (C2) 2. Explain the principles of physiotherapy management for patients with Myopathies (C2) 3. Plan physiotherapy management for a patient with Duchenne Muscular Dystrophy (C3)	2
Unit 6		
Traumatic Spinal Cord Injury:	1. Lists the causes of spinal cord Injury (C1) 2. Explain the mechanisms of Injuries, clinical features and complications of Spinal cord injury (C2) 3. Plan the assessment and outcome measures for patients with spinal cord injury(C3) 4. Explain the rationale for prescribing mobility aids and orthosis (C2) 5. Construct goals and plan the physiotherapy management based on levels of spinal injury in people with complete and incomplete spinal cord injuries (C3)	6

Content	Competencies	Number of Hours
Unit 7		
Diseases of the Spinal Cord:	1. Recall the causes, features and medical management of Transverse myelitis, Syringomyelia and compressive myelopathies (C1) 2. Explain physiotherapy management in people with Transverse myelitis and Syringomyelia (C2) 3. Plan physiotherapy management for people following spinal decompression surgeries (C3)	1
Unit 8		
Neurogenic bladder	1. Define neurogenic bladder (C1) 2. Classify, list the causes and explain the clinical features of types of neurogenic bladder (C2) Plan management strategies for people with neurogenic bladder (C3)	1
Unit 9		
Motor Neuron Disease (MND):	1. Recall Definition, classification, and features of MND (C1) 2. Summarize the physiotherapy evaluation findings for people with MND (C2) 3. Explain the goals and principles of physiotherapy management for people with MND (C2) Plan the physiotherapy management for a person with Amyotrophic lateral sclerosis and Spinal muscular atrophy (C3)	1
Unit 10		
Polyneuropathy	1. Recall types and clinical features of polyneuropathy (C1) 2. Explain the principles of physiotherapy management for persons with polyneuropathy (C2) Summarize physiotherapy evaluation and plan physiotherapy treatment for people with Guillain Barre Syndrome (C2)	3
Unit 11		
Myasthenia gravis	1. Recall types and clinical features of myasthenia gravis (C1) Explain the principles of physiotherapy management including energy conservation techniques for people with Myasthenia Gravis (C2)	1
Unit 12		
Bell's palsy	1. Distinguish the features of facial paralysis between upper motor neuron and lower motor neuron lesions (C4) 2. List the outcome measures and explain the assessment for persons with Bell's palsy(C2) Plan the treatment techniques for persons with Bell's palsy (C3)	1
Unit 13		
Introduction to	1. Classify the types of vestibular disorders (C2)	1

Content	Competencies	Number of Hours
Vestibular Rehabilitation	Explain the principles of physiotherapy management in persons with peripheral vestibular disorders (C2)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	60
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**60**

Assessment Methods:	
Formative:	**Summative:**
	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			
End Semester Exam	x	x	x	x	

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Sophie Levitt. Treatment of Cerebral Palsy and Motor Delay, 5th Edition. 2010. Wiley-Blackwell. 2. Suzan Campbell et al. Physical Therapy for Children, 4th Edition. 2011. Saunders. 3. Tecklin JS. Pediatric Physical Therapy. 5th Edition. 2014. Lippincott Williams & Wilkins 4. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmitz 5. Umphred's Neurological Rehabilitation- 6th Edition 6. Cash's Textbook of Neurology for Physiotherapist (4th Edition) – P A Downie 7. Physiotherapy in Neuro-conditions- Glady Samuel
Additional References	1. Mark Drnach. The Clinical Practice of Pediatric Physical Therapy: From the NICU to Independent Living. 2008. Lippincott Williams & Wilkins. 2. Long, T. and Toscano, K. Handbook of Pediatric Physical therapy. 2nd Edition. 2002. Lippincott, Williams & Wilkins.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Neurological Physiotherapy – II**
Course Code	**PTH3231**
Academic Year	Third
Semester	VI
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system, clinical aspects of neurological disorders and basic assessment and therapeutic skills
Course Synopsis	The module will provide clinical knowledge and skills on evaluation and physiotherapy management of people (adult and children) with neurological disorders.

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

CO1	Apply and demonstrate skills in examination of people with neurological disorders (C3, P4)
CO2	Display treatment techniques as instructed in people with neurological disorders (C3, P4)
CO3	Explain in verbal and written form with patients, caregivers, peers and health care professionals and display skills to work as team member (A3, P2)
CO4	Apply and follow ethical principles during assessment and treatment of people with neurological disorders (C3, A3)
CO5	Compare and contrast treatment approaches based on evidence (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				
CO5						x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Physiotherapy evaluation in people with neurological disorders	1. Display assessment methods to evaluate people with neurological disorders (C3) 2. Perform and explain assessment techniques including history taking, observation, higher mental functions, cranial nerves, sensory system, motor system, reflexes, coordination, balance, gait and functional evaluation in people with neurological disorders (C2, P4, A3) 3. Interpret the report of the relevant	

Content	Competencies	Number of Hours
	investigations of people with neurological dysfunctions (C2)	
Unit 2		
Physiotherapy management for adults and children with neurological conditions	1. Display professional etiquettes during interaction with clients, caregivers and professionals (P3, A2) 2. Organize the problem list based on ICF format (C3) 3. Plan short term and long-term goals using SMART goal approach based on the evaluation findings (C3. A3) 4. Perform treatment techniques in adults and children with neurological disorders under supervision (C2, P4, A3) 5. Identifies oneself as a team member and discusses health related information with clients, caregivers, peers and professionals (A2) 6. Outline and construct home program for patients/caregivers (C2, P2)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small group discussion (SGD		
Case Based Learning (CBL)		
Clinic	78	
Practical		
Assessment		
Total	**78**	

Assessment Methods:	
Formative:	**Summative:**
Case presentation, OSCE, Direct Observation of Procedural skills (DOPS), Clinical competency assessment, Log book maintenance	Sessional Examination (viva-voce and Practical)
	End Semester Exam (Viva-voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Case presentation	x	x			
OSCE		x			
DOPS		x	x		
Clinical competency assessment			x	x	
Sessional Exam	x	x			
End Semester Exam	x	x	x	x	x
Feedback Process	Mid-Semester Feedback				
	End-Semester Feedback				

Main References	1. Sophie Levitt. Treatment of Cerebral Palsy and Motor Delay, 5th Edition. 2010. Wiley-Blackwell. 2. Suzan Campbell et al. Physical Therapy for Children, 4th Edition. 2011. Saunders. 3. Tecklin JS. Pediatric Physical Therapy. 5th Edition. 2014. Lippincott Williams & Wilkins 4. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmitz 5. Umphred's Neurological Rehabilitation- 6th Edition 6. Cash's Textbook of Neurology for Physiotherapist (4th Edition) – P A Downie 7. Physiotherapy in Neuro-conditions- Glady Samuel
Additional References	1. Mark Drnach. The Clinical Practice of Pediatric Physical Therapy: From the NICU to Independent Living. 2008. Lippincott Williams & Wilkins. 2. Long, T. and Toscano, K. Handbook of Pediatric Physical therapy. 2nd Edition. 2002. Lippincott, Williams & Wilkins.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Musculoskeletal Physiotherapy - II**
Course Code	**PTH3202**
Academic Year	Third
Semester	VI
Number of Credits	3
Course Prerequisite	Basic knowledge of applied anatomy, physiology of musculoskeletal system and principles of electro-physical modalities and exercise therapy
Course Synopsis	This course will help the student to understand the mechanisms of soft tissue, sport related, and spinal conditions. This course will help to plan and deliver the management of the above musculoskeletal conditions using contemporary physiotherapy management strategies

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

CO1	Explain the mechanism of injuries, clinical features, and prognosis of musculoskeletal soft tissue and spinal conditions (C2)
CO2	Plans an evidence based comprehensive physiotherapy intervention for soft tissue and spinal musculoskeletal conditions (C3)
CO3	Explains the indications and principles of therapeutic approaches (C2)

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							

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to Sports Injury Rehabilitation	1. List and classify the types of soft tissue injuries of upper limb & lower limb in sports (C2) 2. Summarize the intrinsic and extrinsic factors related to sports injuries (C2) 3. Explain the principles of sports injury rehabilitation (C2)	02
Unit 2		
Soft Tissue conditions	1. Explain the pathomechanics of soft tissue conditions in upper limb & lower limb (C2) 2. Outline the clinical features of soft tissue conditions(C2) 3. Plan the evidence-based physiotherapy management strategies based on phase of healing and physical examination (C3)	16

Content	Competencies	Number of Hours
Unit 3		
Tendon injuries of hand	1. Classify the zones of tendon injuries (C2) 2. Plan the physiotherapy management protocols of tendon injuries (C3)	03
Unit 4		
Musculoskeletal disorders of spine	1. List the musculoskeletal disorders of spine (C1) 2. Explain the mechanisms, clinical features and prognosis of spinal disorders (C2) 3. Plan the evidence-based physiotherapy management strategies based on physical examination findings (C3)	10
Unit 5		
Unit 5: Introduction to Manipulative Therapy	1. Explain the principles of manual therapy concepts (Maitland, McKenzie, Mulligan, Kaltenborn, Neural mobilisation, soft tissue techniques) (C2) 2. List the indications and contraindications for manual therapy techniques (C1)	08

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	10	20
Small group discussion (SGD)	3	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**72**

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**		
Mid Semester / Sessional Examination 1	x	x	x		
Sessional Examination 2					
Presentations	x	x	x		
End Semester Exam	x	x	x		

Feedback Process	Mid-Semester Feedback

	End-Semester Feedback
Main References	1. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach, 3rd Edition By S. Brent Brotzman 2. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)) Fourth Edition by Darlene Hertling BS RPT 3. Skirven TM, Osterman AL, Fedorczyk J, Amadio PC. Rehabilitation of the hand and upper extremity, 2-volume set E-book: expert consult. Elsevier Health Sciences; 2011 Feb 16. 4. Jull G, Moore A, Falla D, Lewis J, McCarthy C, Sterling M. Grieve's Modern Musculoskeletal Physiotherapy E-Book. Churchill Livingstone; 2015 May 11.
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Musculoskeletal Physiotherapy - II**
Course Code	**PTH3232**
Academic Year	Third
Semester	VI
Number of Credits	2
Course Prerequisite	Basic knowledge of applied anatomy, physiology of musculoskeletal system and principles of electro-physical modalities, exercise therapy and theoretical concepts in musculoskeletal physiotherapy
Course Synopsis	The module will provide clinical knowledge and skills in the physiotherapy evaluation and management of people with musculoskeletal conditions

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

CO1	Choose and perform physiotherapy assessment techniques in the examination on people with musculoskeletal disorders (C2, P4, A3)
CO2	Develop a comprehensive plan and perform treatment techniques under supervision in people with musculoskeletal disorders (C3, P4, A3)
CO3	Explain in verbal and written form with patient, caregivers, peers and health care professional and supports as a team member (C2, P2, A3)
CO4	Displays ethical practice and professional etiquette during assessment and treatment of people with musculoskeletal disorders (P3, 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 assessment and treatment in musculoskeletal conditions	1. Perform and organise subjective examination (C3, P4, A2) 2. Plan and detect findings on observation (C3, P1) 3. Perform various assessment procedures including movement examination consisting of ROM Assessment, Muscle strength evaluation (MMT), muscle length evaluation, joint play testing, neurological examination /screening (dermatome, myotome, and reflexes), and palpation, diagnostic orthopaedic tests (P4, A2) 4. Interpret the reports of the relevant investigations with	78

Content	Competencies	Number of Hours
	respect to musculoskeletal conditions (C2) 5. Selects and measures region / condition specific outcome measures (C3, P4) 6. Analyse the examination findings and plan relevant treatment strategies for musculoskeletal conditions (C4, P4) 7. Identifies oneself as a team member and discusses health related information with clients, caregivers, peers, and health care professionals (A2) 8. Display professional etiquettes during interactions with client's caregiver and professional (P3, A2) 9. Organise the problem list based on ICF format (C3) 10. Plan short term and long terms goals using SMART goal approach (C3, A3) 11. Perform physiotherapy treatment techniques for musculoskeletal conditions under supervision (C3, P4, A3) 12. Construct relevant home exercise program for people with musculoskeletal disorders (P3)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)	13	26
Clinic	52	26
Practical		
Revision		
Assessment	13	26
Total	**78**	**78**

Assessment Methods:	
Formative:	**Summative:**
Logbook maintenance, case presentation, DOPS and clinical competency assessment	Mid Semester/Sessional Exam (Viva-voce and Practical)
	End Semester Exam (Viva-voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Logbook maintenance	x	x			
Case presentation	x	x	x	x	
DOPS	x	x			
Clinical competency assessment	x	x	x	x	

Sessional Examination 2	x	x	x	x	
End Semester Exam	x	x	x	x	

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Treatment and Rehabilitation of Fractures 1st Edition by Stanley Hoppenfeld MD 2. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach, 3rd Edition By S. Brent Brotzman 3. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)) Fourth Edition by Darlene Hertling BS RPT 4. Skirven TM, Osterman AL, Fedorczyk J, Amadio PC. Rehabilitation of the hand and upper extremity, 2-volume set E-book: expert consult. Elsevier Health Sciences; 2011 Feb 16.
Additional References	1. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmit

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Neuromusculoskeletal skills - II**
Course Code	**PTH3211**
Academic Year	Third
Semester	VI
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system, and basic exercise and electrotherapy skills
Course Synopsis	The module will provide training on clinical skills through hands on practice on peers or simulated patients in the evaluation and management of people with neurological and musculoskeletal disorders.

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

CO1	Display specific neurological and musculoskeletal skills of physiotherapeutic assessment and therapeutic techniques on the peer or simulated patient. (P3, C2)
CO2	Explain the rationale of procedural steps of assessment and therapeutic techniques. (P2, C2)
CO3	Display professional etiquette while performing physiotherapy assessment and treatment skills (P3, A3)

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	

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Physiotherapy techniques in Stroke	1. Perform neuromuscular evaluation techniques specific to stroke on peer or simulated patient as demonstrated by the instructor (P4) 2. Display positioning, turning, sitting, sit to stand techniques for people with stroke on peer or simulated patient (P3) 3. Display facilitatory and inhibitory techniques on peer as demonstrated by the instructor (P3) 4. Display techniques based on neurophysiological, movement and behavioural science principles to improve	6

Content	Competencies	Number of Hours
	motor, sensory, balance, gait and ADL function in people with stroke (P3) 5. Explain the common complications post stroke and prepare a patient to prevent secondary complications (C2, P2)	
Unit 2		
Physiotherapy techniques in Traumatic Brain Injury	1. Display techniques used in the management of persons with traumatic brain injury (P3)	2
Unit 3		
Physiotherapy intervention strategies in Cerebral Palsy	1. Display physiotherapy skills for improving motor milestones and mobility (P3, A2) 2. Shows and explains the lifting and carrying techniques for young children with Cerebral palsy (P2, A2) 3. Classify and explain different positioning devices/mobility/orthotics aids for promoting function in children with cerebral palsy (C4, P2)	6
Unit 4		
Physiotherapy techniques in Spinal cord injury	1. Display positioning, log rolling and respiratory techniques for persons with spinal cord injury (P2) 2. Display functional mat exercises for persons with quadriplegia or paraplegia (P2) 3. Display strengthening techniques for a person with paraplegia (P2) 4. Plan and demonstrate wheelchair transfers and mobility skills for persons with SCI according to the level of injury (C3, P2) 5. Display methods of Gait training for paraplegia (P2)	6
Unit 5		
Physiotherapy techniques in cerebellar disorders	1. Display assessment skills to identify incoordination resulting from cerebellar disorders (P3) 2. Explain and show the difference between sensory and motor ataxia (C2, P2) 3. Explain and perform treatment techniques to improve stability, balance, coordination and gait (C2, P4, A2) 4. Display Frenkel's exercises (P3)	3
Unit 6		
Physiotherapy techniques in Parkinson disease	1. Display skills to assess rigidity, bradykinesia, posture, balance and gait (P3) 2. Explain and perform treatment techniques to reduce rigidity and bradykinesia, improve posture, balance and gait (C2, P3) 3. Display strategies to overcome freezing, prevent fall (P3)	3

Content	Competencies	Number of Hours
Unit 7		
Examination of wrist, hand spine, pelvis and hip,	1. Display joint specific evaluation skills including range of motion, muscle length, and diagnostic orthopaedic tests (P3)	16
Unit 8		
Physiotherapy treatment skills in musculoskeletal conditions	1. Display physiotherapy skills related to musculoskeletal conditions including therapeutic exercise and joint mobilisation techniques (P3)	10

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	36	36
Revision	16	32
Assessment		
Total	**52**	**68**

Assessment Methods:	
Formative:	**Summative:**
OSCE/OSPE	Mid Semester/Sessional Exam (OSCE/OSPE/Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester / Sessional Examination 1	x	x			
OSCE	x	x	x		

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25. 2. Petty NJ, Moore AP: Neuromusculoskeletal Examination and Assessment. Elsevier Health Sciences; 2011. 3. Jull G, Moore A, Falla D, Lewis J, McCarthy C, Sterling M. Grieve's Modern Musculoskeletal Physiotherapy E-Book. Churchill Livingstone; 2015 May 11. 4. Tecklin JS, editor. Pediatric physical therapy. Lippincott Williams & Wilkins; 2008. 5. Spillane J. Bickerstaff's neurological examination in clinical practice. John Wiley & Sons; 2008 Jan 19. 6. Lindsay KW, Bone I, Fuller G. Neurology and neurosurgery illustrated e-book. Elsevier Health Sciences;

	2010 Sep 9. 7. Davies PM. Steps to follow: the comprehensive treatment of patients with hemiplegia. Springer Science & Business Media; 2000 May 8. 8. Davies PM. Right in the middle: selective trunk activity in the treatment of adult hemiplegia. Springer Science & Business Media; 1990 May 11. 9. Bromley I. Tetraplegia and paraplegia: a guide for physiotherapists. Elsevier Health Sciences; 2006.
Additional References	1. Dejong's The Neurologic Examinations South Asian Edition 2020 By Campbell, Lakshami Narasimhan 2. Cash's Textbook of Neurology for Physiotherapist (4th Edition) – P A Downie 3. Physiotherapy in Neuro-conditions- Glady Samuel 4. Umphred's Neurological Rehabilitation- 6th Edition 5. Physical Rehabilitation (5th Edition)- Susan O Sullivan &Thomas J Schmitz 6. llingworths Development of the Infant and the Young Child 10th Edition 2012 By Ronald S Illingworth

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Movement science in Neurorehabilitation**
Course Code	**PTH3241**
Academic Year	Third
Semester	VI
Number of Credits	03
Course Prerequisite	Basic knowledge on applied anatomy and physiology of nervous system and skill in principles of exercise therapy.
Course Synopsis	The module is deigned to: 1. Provide an overview to the students about the principles of motor control, motor learning and brain plasticity. 2. Provide an overview to the students of the quantitative and qualitative methods of evaluating human movement. 3. Enable the students with the knowledge about the methods that promote recovery of movement following neurological dysfunctions.

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

CO1	Explain the mechanism of motor control, motor learning and brain plasticity (C2)
CO2	Describe the methods of human movement assessment and identify abnormal movement patterns (C3)
CO3	Identify key factors in recovery of function and plan intervention strategies designed to optimize recovery (C3)
CO4	Compare technology based interventions for improving motor recovery (C2)

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					x		
CO4	x						x	

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Human movement characteristics	1. Outline the characteristics of normal human movement (C2) 2. Relate normal movement characteristics to common daily tasks (C2)	3
Unit 2		
Human movement assessment	1. Compare qualitative and quantitative methods of human movement analysis (C2) 2. Identify deviation from normal movement through observational movement analysis (C3)	6

Content	Competencies	Number of Hours
Unit 3		
Initiation and control of human movement	1. Explain the neural control of movement (C2) 2. Summarize the role of perception and cognition in the control of movement (C2) 3. Outline the theories of motor control (C2) 4. Relate the role of neuromuscular system and environment on the motor control (C2)	5
Unit 4		
Principles of motor learning	1. Define motor learning (C1) 2. Summarize the theories of motor learning (C2) 3. Outline the stages of motor learning(C2) 4. Explain the principles of acquiring motor skills(C2) 5. Relate the principles of motor learning for planning physiotherapy management for people with neurological dysfunction(C2)	4
Unit 5		
Brain injury recovery mechanism and Brain plasticity	1. List the theories of brain recovery mechanisms (C1) 2. Describe the physiology of brain recovery (C2) 3. Define brain plasticity and list the factors influencing brain plasticity (C1) 4. Explain mechanism of activity dependent brain plasticity (C2) 5. Relate motor recovery and brain plasticity in people with neurological dysfunctions (C2)	4
Unit 6		
Disordered motor control	1. Outline the pathophysiological mechanism affecting control of movement after brain and spinal cord injury (C2) 2. Explain the characteristics of abnormal movement in people with Brain and Spinal cord Injury (C2)	3
Unit 7		
Predicting motor recovery	1. List the factors affecting motor recovery after brain lesions (C1) 2. Outline the models used for predicting recovery after brain lesions (C2)	2
Unit 8		
Strategies and techniques to improve motor recovery	1. Plan sessions for task based training (C3) 2. List the motor priming techniques (C1) 3. Describe the techniques to improve movement control (C2) 4. Illustrate strategies to improve quantity and quality of movement following brain lesions (C2) 5. Develop a treatment plan to improve motor recovery after brain and spinal lesions. (C3)	8
Unit 9		

Content	Competencies	Number of Hours
Technology based interventions for motor recovery	1. Describe the role of technology in improving human movement (C2) 2. List the technological approaches available for improving motor recovery following neurological disorders. (C1) 3. Compare the advantage and disadvantage of different technological interventions (C2)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):						
Learning Strategies		**Contact Hours**		**Student Learning Time (SLT)**		
Lecture		26		52		
Seminar						
Small group discussion (SGD)		4		8		
Self-directed learning (SDL)						
Problem Based Learning (PBL)		5		15		
Case Based Learning (CBL)		4		8		
Clinic						
Practical						
Revision						
Assessment						
Total		**39**		**83**		
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**	**CO5**
Mid Semester / Sessional Examination 1		x	x			
Presentations				x	x	
End Semester Exam		x	x	x	x	
Feedback Process	Mid-Semester Feedback					
	End-Semester Feedback					
Main References	1. Physical rehabilitation- Susan B O'Sullivan- 6th Edition					
Additional References	1. Motor Control: Translating Research Into Clinical Practice- Anne Shumway-Cook, Marjorie H. Woollacott					

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Pain sciences**
Course Code	**PTH3242**
Academic Year	Third
Semester	VI
Number of Credits	3
Course Prerequisite	Basic knowledge on applied anatomy and physiology of neuromusculoskeltal system, and skill in principles of exercise therapy and electro-physical modalities.
Course Synopsis	This course will help the student to understand the mechanisms, assessment, and management strategies for musculoskeletal pain

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

CO1	Explains the peripheral and central mechanisms of musculoskeletal pain (C2)
CO2	Identifies outcome measures for the assessment of chronic pain (C2)
CO3	Plans comprehensive treatment plan for the management of chronic pain (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		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Mechanisms of musculoskeletal pain	1. Explains the models of pain (C2) 2. Explains the peripheral and central mechanisms of chronic pain (C2) 3. Explains the role of psychosocial factors in chronic pain (C2)	08
Unit 2		
Assessment of chronic pain	1. Explains the subjective and objective features for central pain mechanisms (C2) 2. Applies screening tools for the identification of risk factors for chronicity (C3)	10
Unit 3		
Management strategies for chronic pain	1. Explains management strategies based on the pain mechanisms (C2) 2. Develops multidisciplinary pain management strategies for chronic pain (C3) 3. Explains the educational, exercise and manual therapy regimens in the treatment of chronic pain inclusive of pain neuroscience education (C2)	21

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	24	30
Seminar	06	
Small group discussion (SGD)	04	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	05	10
Revision		
Assessment		
Total	**39**	**40**

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**	**CO5**
Mid Semester / Sessional Examination 1	x	x	x		
Presentations	x	x	x		
End Semester Exam	x	x	x		

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Jull G, Moore A, Falla D, Lewis J, McCarthy C, Sterling M. Grieve's Modern Musculoskeletal Physiotherapy E-Book. Churchill Livingstone; 2015 May 11.
Additional References	

SEMESTER - VII

COURSE CODE	:	COURSE TITLE
CMS4101	:	Community Medicine And Sociology
PTH4101	:	Theoretical concepts in Cardiopulmonary Physiotherapy - I
PTH4131	:	Clinical Practice in Cardiopulmonary Physiotherapy - I
PTH4102	:	Theoretical concepts in Community Physiotherapy
PTH4132	:	Community physiotherapy Practice
PTH4103	:	Evidence Based practice in Physiotherapy
PTH4111	:	Cardiopulmonary and community physiotherapy skills

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**General Surgery**
Course Code	**SUR4101**
Academic Year	Fourth
Semester	VII
Number of Credits	3
Course Prerequisite	Knowledge of Anatomy, physiology, pathology and biochemistry
Course Synopsis	The course is intended to provide knowledge about 1. Various surgical procedures related to common general conditions, conditions such as cardiothoracic, vascular, ENT, ophthalmic, cancers and plastic surgery 2. Management of these surgical conditions - Conservative and surgical management 3. Common and specific complications arising due to these surgeries and their prevention and further management

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the common indications and lists down the common investigations used for the surgical procedures (C2)
CO2	Explain the surgical management of common surgical conditions and post-surgical care (C2)
CO3	Explain the complications of common surgical procedures (C2)
CO4	Outline the prevention strategies and precautions to be taken for common surgical complications (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
GENERAL SURGERY		
Unit 1:		
Effects of Anesthesia on body systems (Emphasizing on Cardiopulmonary and Metabolic systems)	1. Define Anaesthesia (C1) 2. Classify types of Anaesthesia (C2) 3. Explain the effects of anaesthesia on different body systems with emphasis on cardiopulmonary and metabolic system (C2)	1
Unit 2:		
Introduction to Blood Transfusion	1. Define blood transfusion? (C1) 2. Outline the types of blood products used in	1

Content	Competencies	Number of Hours
	blood transfusion (C2) 3. List the indications and contraindications for blood transfusions (C1) 4. List down the precautions taken during blood transfusion (C1) 5. Explain the complications of blood transfusion (C2)	
Unit 3:		
Wound Management	1. Explain different types of wounds (C2) 2. Summarize the stages of Wound Healing (C2) 3. What are surgical Sinuses and Trophic ulcers (C1) 4. Explain gangrene (C2) 5. Describe the principles of Treatment and Methods of Wound Management (C2)	2
Unit 4:		
General Surgical procedures	1. Describe the incisions used in general surgery including abdominal surgery and amputations (C1) 2. List the indications for common general surgical procedures (C1) 3. List down the diagnostic procedures used in general surgical procedures (C1) 4. Summarize the general surgical procedures (muscles cut/muscles split, drains used) (C2) 5. Outline immediate and late complications of general surgery (Hemorrhage, shock, fluid and electrolyte imbalance, pulmonary system, cardiovascular system, musculoskeletal, metabolic system related complications and complications to specific general surgery) (C2) 6. Explain amputation care (C2) 7. Explain the management of Hernia (C2) 8. Explain colostomy care (C2)	5
Unit 5		
Hemorrhoids, incontinence and rectal prolapse	1. Explain the causes of hemorrhoids, incontinence and rectal prolapse (C2) 2. List down the investigations used for the diagnosis (C1) 3. Outline the surgical procedures for hemorrhoids, incontinence and rectal prolapse (C2)	1
ENT		
Unit 6		
Sinusitis and infections of parotid glands	1. List down the causes of sinusitis and parotid gland infections (C1) 2. List down the symptoms of sinusitis and parotid gland infections (C1) 3. List down the investigations used for the	1

Content	Competencies	Number of Hours
	diagnosis (C1) 4. Outline the surgical procedures for sinusitis and parotid gland infections (C2)	
Unit 7		
Otitis media	1. Define Otitis Media? (C1) 2. List down the causes of Otitis media (C1) 3. Classify types of Otitis media (C2) 4. List down the symptoms of Otitis media (C1) 5. List down the investigations used for the diagnosis (C1) 6. Outline the management of Otitis media (C2)	1
Unit 8		
Benign paroxysmal positional vertigo and vestibular dysfunction	1. Define BPPV? (C1) 2. Explain the pathophysiology of BPPV (C2) 3. Explain management of BPPV (C2) 4. Classify vestibular dysfunction (C2) 5. Explain the causes of various vestibular dysfunction and their types (C2) 6. List down the investigations used for the diagnosis (C1) 7. Explain the management of vestibular dysfunction (C2)	2
Unit 9		
Tracheostomy	1. Desribe tracheostomy? (C2) 2. List down the indications for tracheostomy (C1) 3. List down the surgical procedure of tracheostomy (C1) 4. Explain tracheostomy care (C2) 5. Explain the complications of tracheostomy (C2) 6. Explain decanulation? (C2) 7. List down the indications for decanulation (C1)	1
OPHTHALMOLOGY		
Unit 10		
Conditions affecting visual acuity	1. List down the conditions affecting visual acuity (C1) 2. List down the causes of visual acuity (C1) 3. Explain the pathophysiology of conditions causing visual acuity (C2) 4. Explain the management of conditions affecting visual acuity (C2)	2
Unit 11		
Common Ophthalmic Surgeries	1. Outline common ophthalmic surgeries (C2)	1
Unit 12		
Visual Field and Refraction Testing	1. Explain various visual field testing (C2) 2. Explain refraction testing in adults and children (C2)	1

Content	Competencies	Number of Hours
CARDIOTHORACIC SURGERY		
Unit 13		
Overview of investigations and diagnostic procedures	1. Lists the various investigations commonly used in the preoperative work up for a patient undergoing elective and emergency cardiothoracic & vascular surgery (C1) 2. Recalls the various diagnostic procedures that are performed (both invasive and minimally invasive) (C1) 3. Recalls various indications for emergency cardiothoracic and vascular surgery (C1)	1
Unit 14		
Chest Trauma and Intercostal drains	1. Recalls the various trauma that can occur to the chest wall (lung contusion, haemothorax, pneumothorax, rib fracture and flail chest) and its management (C1) 2. Explains the indications, insertion, functioning, care and precautions for the intercostal drain (C2)	2
Unit 15		
Pulmonary surgeries	1. Lists the various indications and approaches (traditional, minimally invasive and video assisted) for pulmonary surgery (C1) 2. Describes the various thoracic incisions and the related complications (C2) 3. Explains the procedure and recalls the complications specific to various procedure like lung resections, pneumonectomy, pleural resection and diaphragm repair (C2)	2
Unit 16		
Cardiac surgeries	1. Lists the various indications and approaches (traditional, minimally invasive, robotic) for cardiac surgery in both the adult and child (C1) 2. Explains the procedure and recalls the complications specific to various procedures like coronary artery bypass graft surgery, valve replacement and cardiopulmonary bypass (C2) 3. Outlines the various procedures carried out for congenital heart disease repair (C2)	3
Unit 17		
Vascular surgery	1. Lists the various surgical procedures (I.e., fistula formation, endarterectomy and bypass), their approaches (open vs. Endovascular) and complications (C1)	1

Content	Competencies	Number of Hours
PLASTIC SURGERY		
Unit 18		
Burns:	1. Classify types of Burn(C2) 2. List out the causes of burns (C1) 3. List out the clinical features of burns(C1) 4. Outline immediate and late complications(Cardiac,Pulmonary,Metabolic, Renal, Skin and Musculoskeletal) of burns(C2) 5. Explain the acute and long-term management of burns (C2)	3
Unit 19		
Skin Grafts and Flaps	1. Classify types of Skin grafts and Flaps(C2) 2. Explain Post-operative management of skin grafts and flaps (C2) 3. List the various indications for cosmetic surgery(C1) 4. List out the criteria for grafts and flap selection(C1)	3
SURGICAL ONCOLOGY		
Unit 20		
Palliative and Reconstructive Surgeries in Head and Neck Cancer Emphasizing on Tongue, Buccal Mucosa, Floor of Mouth, Mandible, Maxilla, Pharynx, Larynx Surgical Indications, Procedures like Functional Neck Dissection and Excision and Flap Reconstruction - Post Operative Management and Complications	1. List the surgical indications for head and neck cancer surgeries. (C1) 2. Classify the types of head and neck dissections in patients with head and neck cancer (C2) 3. List down the diagnostic investigations (C1) 4. Explain the post-operative management after neck dissections (C2) 5. List the various post- operative complications in patients with head and neck cancer. (C1)	3
Unit 21		
Carcinoma Breast and gynaecological cancers- Surgical Indications, Procedure, Post-Operative Management and Complications	**1.** List the surgical indications in different types of breast cancer and gynaecological cancers (C1) 2. Classify the types of surgical procedures performed in breast cancer surgery and gynaecological cancer surgeries (C2) 3. List the post-operative complications after a breast cancer surgery and gynaecological cancer surgeries (C1) 4. List down the investigations used in the diagnosis (C1) 5. Explain the post-operative management after breast cancer surgery and gynaecological cancer surgeries (C2)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	**39 hours**	**78 hours**
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**121**

Assessment Methods:	
Formative:	**Summative:**
Quiz	Mid Semester / Sessional Exam (Theory)
	End Semester Examination (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x	x	x		
Presentations						
End Semester Exam	x	x	x	x		

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Bailey and Love's short practice of Surgery, 27th edition 2. Sabiston Textbook of Surgery, 20th Edition 3. Dutta's textbook of gynaecology
Additional References	1. On-Pump and Off-Pump Coronary Artery Bypass Grafting by Shekar PS https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.105.566737 2. Surgical Intervention for Peripheral Arterial Disease by Gaudino M et al. https://www.ahajournals.org/doi/epub/10.1161/CIRCULATIONAHA.118.035956 3. Surgical Intervention for Peripheral Arterial Disease by Vartanian MS et al. https://www.ahajournals.org/doi/full/10.1161/circresaha.116.303504

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Community Medicine and Sociology**
Course Code	**CMS4101**
Academic Year	Fourth
Semester	VII
Number of Credits	3
Course Prerequisite	Knowledge of human anatomy and physiology
Course Synopsis	The module is deigned to: 1. Provide an overview to the students about the principles of community medicine and sociology with its impact on human behavior. 2. Enable the students with the knowledge about the epidemiology of communicable and non-communicable diseases, its prevention strategies and various national health programs. 3. Provide an overview to the students of the various health care delivery systems and integrating them to achieve the sustainable development goals. 4. Describes the socio-cultural and environmental influence on health and disease.

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

CO1	Explain the concepts of health, dynamics of disease transmission and its prevention and control including the role of family and community (C2)
CO2	Compare and contrast various epidemiological methods and identify the socio-cultural and environmental factors that influence health of a person (C4)
CO3	Identify the role of health care team members, to work in coordination for the promotion of health of the community (C3)
CO4	Explain the various health education and health delivery systems (C2)
CO5	Describe the overview of national level health care programmes/ policies and sustainable development goals (C2)

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					

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
COMMUNITY MEDICINE		
Unit 1		
Health and Diseases	1. Outline the concepts of health and diseases, determinants and indicators of health (C2) 2. Explain the natural history of disease and concept	02

Content	Competencies	Number of Hours
	of causation (C2)	
Unit 2		
Prevention of diseases	1.Describe the dynamics and modes of disease transmission and the role of immunizing agents(C2) 2.Distinguish between various levels of disease prevention and control (C4)	02
Unit 3		
Principles of epidemiology and epidemiological methods	1.Define epidemiology (C1) 2.Outline the concepts of epidemiology (C2) 3.Explain the various tools of measurement and its uses (C2) 4.Compare and contrast various epidemiological methods in research (C4)	02
Unit 4		
Epidemiology of communicable diseases	1.Describe the epidemiology and prevention of Tuberculosis, Filariasis, Leprosy, HIV/ AIDS (C2) 2.Summarize the national programs in brief (C2)	04
Unit 5		
Epidemiology of non-communicable diseases	1.Explain the epidemiology and prevention of cardiovascular diseases, hypertension, stroke, cancer, diabetes, obesity, hospital acquired infections (C2) 2.Summarize the national programs in brief (C2)	06
Unit 6		
Women and child health care	1.Outline antenatal, intranatal and postnatal care (C2) 2.Discuss the overview of RCH (Reproductive and Child Health and NRHM (National Rural Health Mission) programmes(C3) 3.Explain the neonatal and under five care, family planning and family welfare services (C2)	03
Unit 7		
Health and nutrition	1.Outline the principles of nutrition, food components and balanced diet (C2) 2.Explain the features of nutritional deficiency disorders- PEM, IDD, IDA, Vitamin A (C2) 3.Summarize the national programs for addressing nutritional deficiency disorders in brief (C2)	02
Unit 8		
Occupational health	1.Discuss the types of occupational hazards and occupational diseases (C2) 2.Explain the methods of prevention of occupational disorders including occupational cancers (C3)	02
Unit 9		
Health education and health delivery system	1.Define health education and health literacy (C1) 2.Outline the principles and contents of health delivery systems (C2) 3.Compare various health care delivery systems including e health care, tele health care (C4) 4.Plan health care delivery system in urban and	01

Content	Competencies	Number of Hours
	rural set up (C3)	
Unit 10		
Goals, Policies and Agencies	1.Illustrate the national health policies (C2) 2.Summarize the millennium development goals and sustainable development goals (C2) 3.Explain the role of international health agencies (C2	02
SOCIOLOGY		
Unit 1		
Introduction to Sociology	1.Define Sociology (C1) 2.Understand the application of sociology in health care services.(C2)	01
Unit 2		
Social factors in health and disease situations	1. Describe the role of social factors affecting health (C2)	01
Unit 3		
Socialization	1.Describe the types and agencies of socialization.(C2) 2.Describe the influence of social factors on personality. (C2) 3.Explain the relevance of socialization in hospital and rehabilitation settings. (C2)	02
Unit 4		
Family	1.Outline the concept of family (C1) 2.Identify changes in the structure and functions of modern family and its role in the development of personality. (C2) 3.Explain the role of family in health and disease.(C2) 4.Describe factors of family that influence nutrition(C2) 5.Explain the effects of sickness on family. (C2) 6.Identify social groups and their role in hospital and rehabilitation centre. (C2)	02
Unit 5		
Community	1.Understand the concept of community. (C2) 2.Identify the types of community and their health problems(C2) 3.Describe the concept of caste and class. (C2) 4.Explain the role of caste and class in health care system (C2)	01
Unit 6		
Culture	1.Understand the concept of culture and its impact of culture on human behaviour, health and health disorder. (C2) 2.Describe the cultural responses to sickness and decision making in the treatment. (C2)	02
Unit 7		
Social change	1.Explain the meaning and consequences of social changes in relation to health and diseases. (C2)	01

Content	Competencies	Number of Hours
	2. Explain the role of social planning in the improvement of health and rehabilitation. (C2)	
Unit 8		
Social control	1. Define social control. (C1) 2. Identify the means of social control and their importance in regulation of human behaviour.(C2)	01
Unit 9		
Social Problems	1. Identify various social problem and its consequences in India. (C1) 2. Describe preventive measures for social problems. (C2)	01
Unit 10		
Social security and welfare programs for differently abled and aged	1. Highlight various social security and welfare programs for differently abled and aged. (C1)	01

Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	54 + 26
Total	**39**	**80**

Assessment Methods:

Formative:	**Summative:**
Quiz/ Presentations	Mid Semester/Sessional Exam (Theory)
	End Semester Examination (Theory)

Mapping of Assessment with COs:

Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester / Sessional Examination 1	x	x	x		
End Semester Exam	x	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Park, K. (2011). *Park's textbook of preventive and social medicine*. Jabalpur: M/S Banarsidas Bhanot. 2. Sachdeva and Vidhyabhushan – An introduction to Sociology-Century printers, Allahabad 3. Shankar Rao C.N: Sociology 2005 -S. Chand & Company Ltd. New Delhi 4. G. Stenley Jaykumar & P Sivkumar: Medical Sociology – Grooming Social Scientist in medical field 2007 -Social Publications, New Delhi
Additional References	1. Textbook of Community Medicine – Preventive and Social Medicine.CBS Publishers and Distributors Pvt., Ltd : New Delhi, India. INR 895. 2017. 5th edition. Sunder Lal, Adarsh, Pankaj, editors. 807. ISBN: 9789386217554 2. Madan G. E: Indian social Problems-Allied publishers Pvt Ltd. Mumbai 3. Rawat H.R sociology- Basic concepts 207

Manipal College of Health Professions								
Name of the Department	Physiotherapy							
Name of the Program	Bachelor of Physiotherapy							
Course Title	**Theoretical concepts in Cardiopulmonary Physiotherapy - I**							
Course Code	**PTH4101**							
Academic Year	Fourth							
Semester	VII							
Number of Credits	03							
Course Prerequisite	Basic knowledge on applied anatomy, physiology of cardiovascular and pulmonary system and basic exercise physiology							
Course Synopsis	This module is designed to– Provide students with knowledge on cardiovascular and pulmonary evaluation for preventive, and rehabilitative physiotherapy interventions.							
Course Outcomes (COs): **At the end of the course student shall be able to:**								
CO1	Plan a comprehensive assessment for people with cardiovascular and pulmonary dysfunctions (C3)							
CO2	Explain clinical features and complications of acute respiratory illness (C2)							
CO3	Describe primary and secondary dysfunctions due to cardiovascular and pulmonary disorders in children and adults (C2)							
CO4	Compare and contrast various cardiopulmonary physiotherapy techniques and choose appropriate treatment strategies based on evidence(C4)							
CO5	Develop a physiotherapy treatment plan for adults and children with acute respiratory illness (C3)							
	Mapping of Course Outcomes (COs) to Program Outcomes (POs):							
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
CO1	x							
CO2	x							
CO3	x							
CO4	x					x		
CO5	x					x		

Course Content and Outcomes:

Content	Competencies	Number of Hours
Unit 1		
Physiotherapy evaluation of: Cardiovascular system and pulmonary system	1. Outline the cardiovascular and pulmonary system evaluation format (C2) 2. Explain the components of cardiovascular and pulmonary systems examination (C2)	03
Unit 2		
Investigations	Chest radiography:	08

Content	Competencies	Number of Hours

	• Interpret specific radiological features in: (C3)
	  ○ Normal chest radiograph
	  ○ Pleural disorders, hyperinflation, Consolidation, Collapse, Pulmonary fibrosis, destroyed lung, cardiomegaly,
	  ○ common artifacts/devices seen in chest radiographs (ECG electrodes, endotracheal tube, Nasogastric tube, central line, Intercostal drain, pacemaker)
	Spirometry
	1. Describe lung volumes and capacities (C2)
	2. List the indications for spirometry and the parameters assessed (C1)
	3. Interprets basic measurements in spirometry (C3)
	4. Describes flow volume loop characteristics in obstructive and restrictive lung diseases (C2)
	Arterial Blood Gas analysis
	1. Describe the chemical, pulmonary and renal buffer system (C2)
	2. List the indications for ABG and parameters assessed (C1)
	3. Interpret arterial blood gases and apply them in clinical conditions (C2)
	4. List the causes for simple acid base disturbances (C1)
	ECG:
	1. List the indications for ECG (C1)
	2. Describe the electrophysiology of the heart (C2)
	3. Explain leads, normal ECG wave form with diagram and description of each wave (C2)
	4. Report heart rate and axis from an ECG(C2)
	5. Recognize and summarise electrocardiographic features for the following (C2)
	  ○ Myocardial infarction, myocardial ischemia
	  ○ Tachycardias: Atrial fibrillation, atrial flutter, ventricular tachycardia, ventricular fibrillation
	  ○ Bradycardias: Heart blocks
	6. Outlines important ECG changes noted during exercise testing (C2)	

Unit 3		
Physiotherapy management in respiratory care A) Bronchial Hygiene therapy	1. Describe the normal mucociliary clearance mechanism (C2) 2. Discuss the indications, contraindications, technique, mechanisms, advantages and disadvantages, monitoring, precautions/hazards, if any, for the following bronchial hygiene techniques: (C2)	7

Content	Competencies	Number of Hours
	• Postural drainage and modified postural drainage positions • Breathing techniques: Active Cycle of Breathing Technique, Autogenic Drainage, Forced Expiratory Technique, assisted coughing techniques • Airway clearance devices: Positive expiratory pressure, High Frequency Chest wall oscillation, mechanical insufflator-exsufflator • Adjuncts to airway clearance techniques: Aerosol therapy and Humidification 3. List the drugs that influence bronchial hygiene(C1)	
B) Lung Expansion therapy	1. Describe the oxygen transport mechanism (C2) 2. Describe types of atelectasis and their causes. (C2) 3. Discuss the indications, contraindications, technique, mechanisms, advantages and disadvantages, monitoring, precautions/hazards, if any, of following lung expansion therapy (C2) • Relaxation techniques, Breathing exercises, Incentive Spirometry, Intermittent Positive Pressure Breathing, Noninvasive mechanical ventilation and Neurophysiologic facilitation of breathing	04
C) Therapeutic positioning and early mobilization	1. Discuss the indications, contraindications, technique, mechanisms, advantages and disadvantages, monitoring, precautions/hazards, if any, of (C2) • Therapeutic positioning • Early mobilization 2. List the drugs that has an influence on early mobilization (C1)	03
Unit 4		
Physiotherapy in ICU and acute respiratory illness	1. Describe ICU setup (C2) 2. List the roles of different ICU team member (C1) 3. List the uses of different ICU equipment and monitoring methods (C1) 4. Discuss the use of different organ support systems (C2) a. Oxygen therapy (including indications, types of delivery system, complications) b. Artificial airways (including indications, types, and complications) c. Mechanical ventilation (including physiology, types, modes, complications,	11

Content	Competencies	Number of Hours
	weaning) d. Drugs 5. Contrast the evaluation methods used in ICU compared to a patient on floors/wards (C4) 6. Discuss the common physiotherapy management in ICU which includes: (C2) a. Respiratory care including precautions/care of a patient with oxygen therapy, artificial airway and mechanical ventilation and high flow nasal oxygen b. Prevention of consequences of immobilization 7. Discuss the physiotherapy management and precautions to be taken in the following common critical illnesses: (C2) a. Respiratory failure b. ARDS c. Cardiogenic pulmonary edema d. Pneumonia e. Poisoning (drug/pesticides/snake bites) f. Neuromuscular diseases / Traumatic Brain injury / Stroke (emphasis on respiratory care)	
Unit 5		
Pediatric Respiratory Care:	1. Contrast the differences of the anatomy and physiology between adult and pediatric Respiratory System and explain its implications to physiotherapy (C2) 2. List various equipment used in NICU/PICU (C1) 3. Describe physiotherapy management plan in following common Pediatric Respiratory conditions (C2) a. Infant Respiratory Distress Syndrome, Meconium Aspiration Syndrome b. Invasively mechanically ventilated pediatric patients	03

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	39
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Total	**39**	**78**

Assessment Methods:					
Formative:		**Summative:**			
Mid Semester/Sessional Exam (Theory)		Mid Semester/Sessional Exam (Theory)			
		End Semester Exam (Theory)			
Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Mid Semester Examination	x	x	x	x	x
End Semester Exam	x	x	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics – Jennifer Pryor and Ammani Prasad 2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan Cash, Patricia Downie, DM Innocenti and SE Jackson 3. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice – 5th Edition – Donna Frownfelter and Elizabeth Dean 4. Physiotherapy in respiratory care by Alexandra Hough 5. Cardiovascular and Pulmonary Physical Therapy by Joanne Watchie
Additional References	1. Management of the mechanically ventilated patient by Lynelle Pierce 2. Chest X-ray Made Easy by D Karthikeyan 3. ECG made easy by John Hampton and Joanna Hampton 4. Paediatric Respiratory Care by Juliette Hussey and Ammani S Prasad 5. Wilkin's clinical assessment in respiratory care by Al Heuer

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Cardiopulmonary Physiotherapy - I**
Course Code	**PTH4131**
Academic Year	Fourth
Semester	VII
Number of Credits	2
Course Prerequisite	Student should have basic knowledge on applied anatomy and physiology of cardiovascular and pulmonary system, and exercise therapy and electrotherapy skills.
Course Synopsis	The module will provide information about principles of evaluation and management of people with cardiopulmonary disorders using contemporary techniques.

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

CO1	Display the ability to apply the principles of rehabilitation for evaluation and management of people with cardiovascular and pulmonary disorders (C2, P4, A2)
CO2	Builds a rapport with clients, caregivers, peers and health care team and prepare to work as a member of cardiovascular and pulmonary care team (C3, P4, A2)
CO3	Demonstrate and displays ethical behavior during assessment and treatment of people with cardiovascular and pulmonary disorders (C3, 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		
Physiotherapy evaluation and management of people with cardiovascular and pulmonary disorders	1. Perform physiotherapy assessment in clients with cardiopulmonary disorders. (C3, P4, A3) 2. Displays the ability to interpret investigations for cardiovascular and pulmonary conditions (C3, P4) 3. Organizes problem list (P4, A3) 4. Plan short term and long-term goals based on the evaluation findings (C3, A3) 5. Plan and perform appropriate treatment techniques in people with cardiovascular and pulmonary disorders (C3, P4, A3) 6. Prepares to work as a member in rehabilitation team for people with cardiovascular and pulmonary disorders. (P2, A3) 7. Displays ethical and professional behavior	78

Content	Competencies	Number of Hours
	(Autonomy, Beneficence and Justice) during assessment and treatment of people with cardiovascular and pulmonary disorders. (C3, P4, A3)	
Unit 2		
Physiotherapy in critical care	1. Perform physiotherapy assessment in critically ill client (C3, P4, A3) 2. Displays the ability to interpret investigations in intensive care units (C3, P4) 3. Organizes problem list (P4, A3) 4. Plan short term and long-term goals based on the evaluation findings (C3, A3) 5. Plan and perform appropriate treatment techniques for critically ill clients (C3, P4, A3) 6. Displays the ability to interpret the continuous monitoring of parameters in intensive care units (P4 7. Demonstrate ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and treatment of people with cardiopulmonary disorders (C2)	
Unit 3		
Pediatric Respiratory Care:	1. Relates cardiorespiratory physiotherapy assessment in paediatric clients (C2, P1, A1) 2. Relates cardiorespiratory physiotherapy management in paediatric clients (C2, P1, A1)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small group discussion (SGD)	8	16
Case Based Learning (CBL)	8	16
Clinic	52	52
Assessment	10	20
Total	**78**	**104**

Assessment Methods:	
Formative:	**Summative:**
Log book maintenance, Case presentation, OSCE, DOPS and Clinical competency assessment,	Sessional Exam (Viva-voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Log book maintenance					
Case presentation,	x	x			
OSCE		x			
DOPS		x	x		

Clinical competency assessment			x	x	
Sessional Examination	x	x			
Feedback Process	Mid-Semester Feedback				
Main References	1. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics – Jennifer Pryor and Ammani Prasad 2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan Cash, Patricia Downie, DM Innocenti and SE Jackson 3. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice – 5th Edition – Donna Frownfelter and Elizabeth Dean 4. Physiotherapy in respiratory care by Alexandra Hough 5. Cardiovascular and Pulmonary Physical Therapy by Joanne Watchie				
Additional References					

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Community Physiotherapy**
Course Code	**PTH4102**
Academic Year	Fourth
Semester	VII
Number of Credits	03
Course Prerequisite	Basic knowledge in applied anatomy, physiology and physiotherapeutic skills.
Course Synopsis	This module is designed – 1. To understand the principles, approaches and methods of community based rehabilitation. 2. The module is intended to provide the student an opportunity to learn about the role of physiotherapist in the evaluation and management of problems related to older adults. 3. To gain knowledge and apply the concepts of occupational health and ergonomics.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the concept, classification and models of disability.(C2)
CO2	Apply the principles of rehabilitation for evaluation and management of persons with disabilities. (C3)
CO3	Relate the theories and physiological changes associated with aging (C2)
CO4	Apply and analyse the strategies to promote healthy aging and plan physiotherapeutic management of disorders in older adults (C4)
CO5	Interpret the etiopathogenesis of work-related musculoskeletal disorders and to apply the tools for evaluating occupational risk factors (C3)
CO6	Make use of the principles of ergonomics and return to work programs to develop preventive and restorative management strategies (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							
CO4	x					x		
CO5	x		x					
CO6	x					x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Community Based Rehabilitation (CBR)	1. Define and classify rehabilitation (C2) 2. Explain the levels of intervention including preventive, restorative and compensatory	2

Content	Competencies	Number of Hours
	strategies. (C2) 3. Identify and apply the principles, guidelines and structure for CBR program by World Health Organization. (C3)	
Unit 2:		
Approaches in rehabilitation	1. Outline the various approaches in rehabilitation (C2) 2. Explain different approaches including Institutional based rehabilitation and CBR (C2)	1
Unit 3:		
Evaluation of patients and programs in Community Based Rehabilitation	1. Plan and develop the evaluation protocol for patients with disability (C3) 2. Explain the process of CBR programs with emphasis on its planning, implementation and evaluation (C2)	3
Unit 4		
International Classification of Functioning, Disability and Health (ICF), World Health Organization	1. Outline the models of disability (C2) 2. Identify the structure, scope, and application of ICF in Physiotherapy (C3)	2
Unit 5		
Physiotherapy perspectives of community based rehabilitation for persons with disabilities	1. Develop, apply and analyse the management strategies for community reintegration of persons with disabilities including traumatic, degenerative, vascular and congenital conditions of neurological, musculoskeletal and cardiopulmonary systems. (C4)	5
Unit 6		
Theories of Ageing	1. Outline the biological, psychosocial and ecological theories of aging and its relevance to physiotherapy. (C2)	2
Unit 7		
Physiological changes associated with ageing	1. Summarize the morphological and physiological changes associated with aging in cardiopulmonary, musculoskeletal, neurological, thermoregulatory, endocrine systems (C2)	4
Unit 8		
Exercise testing and prescription in healthy aging	1. Explain special considerations to exercise testing and prescription for older adults (C3) 2. Choose relevant exercise test battery (C3) 3. Explain the acute responses and chronic adaptation to exercise (C2)	4
Unit 9		
Psychosocial implications of ageing	1. Explain the psychosocial and cultural implications of aging (C2)	1

Content	Competencies	Number of Hours
Unit 10		
Role of Physiotherapy in geriatric syndromes	1. Outline the pathophysiological basis of common geriatric syndrome: Falls, Dementia, Osteoporosis and Incontinence. (C2) 2. Choose relevant outcome measure for evaluating geriatric syndrome (C3) 3. Plan, develop and analyse interventions for common geriatrics syndromes (C4)	4
Unit 11		
Role of Physiotherapy in institutionalized older adults	1. Classify the types of institutions and outline the predictors of institutionalization among older adults(C2) 2. Identify the role of physiotherapy in institutionalized older adults.(C3)	1
Unit 11		
Industrial Therapy	1. Illustrate the principles, scope, spectrum and role of team members in industrial health (C2) 2. Identify the role of physiotherapy in industrial therapy (C3)	1
Unit 12		
Ergonomics	1. Define ergonomics (C1) 2. Outline the principles of ergonomics (C2) 3. Apply the domains of ergonomics evaluations in Occupational health (C3) 4. Outline and apply engineering, administrative and personal protective control in ergonomics (C3)	3
Unit 13		
Work related musculoskeletal disorders (WRMSDs)	1. Define and classify WRMSD (C2) 2. Outline the risk factors and clinical features of WRMSD (C2) 3. Plan the evaluation, and develop the preventive and restorative management of WRMSD (C3)	4
Unit 14		
Return to work	1. Outline the process of return to work including functional capacity evaluation, job simulation (C2)	1
Unit 15		
Application of ergonomics	1. Outline the general ergonomic guidelines for design (C2) 2. Relate the principles of ergonomics in the design of sports equipment, assistive technology and commonly used appliances (C2)	1

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	39	99
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		18
Total	**39**	**117**

Assessment Methods:	
Formative:	**Summative:**
Quiz/ presentation	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs:						
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Mid Semester / Sessional Examination 1	x	x	x	x	x	x
End Semester Exam	x	x	x	x	x	x

Feedback Process:	Mid-Semester Feedback
	End-Semester Feedback
Main Reference:	1. Community Based Rehabilitation. Malcom Peat, W B saunders 1997. 2. Community Based Rehabilitation for perons with disability. S. Pruthvish 2006 3. International Classification of Functioning Disability and Health, WHO 4. Geriatrics Physical therapy- Andrew Guccione 5. Geriatrics Rehabilitation- Carole Lewis and Jennifer Bottomley 6. Industrial Therapy- Gllenda Key 7. Introduction to Ergonomics- Bridger 8. Ergonomics Design for people at work- Kodak 9. Ergonomics for Therapist-Valerie Berg Rice
Additional References	1. Bradoom's Physical Medicine and Rehabilitation, 5th edition, Elsevier, 2015. 2. DeLisa's Physical Medicine and Rehabilitation, 5th edition, Lippincott Wiliams and wilkins 3. Multidisciplinary Approach to Rehabilitation- Shrawan Kumar 4. Physical Medical and Rehabilitation- Susan B.O'Sullivan

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Community physiotherapy Practice**
Course Code	**PTH4132**
Academic Year	Fourth
Semester	VII
Number of Credits	02
Course Prerequisite	Basic knowledge in applied anatomy, applied physiology and physiotherapeutic skills.
Course Synopsis	The module will provide information about principles of evaluation and management of people with disabilities in the community. It will also help students to understand about the rehabilitation of older adults and injured workers using contemporary techniques.
Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Display the ability to apply the principles of rehabilitation for evaluation and management of persons with disabilities, older adults and workers. (C3,P4, A2)
CO2	Builds a rapport with clients, caregivers, peers and community health workers and prepare to work as a team member (C3,P4, A2)
CO3	Demonstrate and displays ethical behavior during assessment and treatment of people with disabilities, older adults and workers (C3,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:		
Physiotherapy evaluation and management in people with disabilities	1. Perform physiotherapy assessment in people with disabilities (P4, A3) 2. Organizes problem list using the international classification of functioning, disability and health framework (P4, A3) 3. Plan short term and long-term goals using SMART goal approach based on the evaluation findings (C3, A3) 4. Plan and perform appropriate treatment techniques in people with disabilities (C3, P4, A3) 5. Explain health-related information with patients, caregivers, peers and community health workers (A3)	78

Content	Competencies	Number of Hours
	6. Prepares to work as a member in rehabilitation team for people with disabilities (P2, A3) 7. Demonstrate ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and treatment of people with disabilities (A3)	
Unit 2:		
Physiotherapy evaluation and management in older adults	1. Perform physiotherapy evaluation of older adults (P4, A3) **2.** Choose tools and perform evaluation of balance, falls, coordination, gait, activities of daily living and cognition among older adults. (C3, P4, A2) 3. Use test batteries to perform fitness evaluation for older adults. (P4, A2) 4. Organize the findings from the test batteries and develop an exercise program for older adults. (C3, P4, A2) **5.** Demonstrate ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and treatment of older adults (A3)	
Unit 3:		
Physiotherapy evaluation and management in occupational health	1. Perform workstation evaluation, task evaluation and risk factor evaluation, evaluation of manual material handlers, job demand analysis and occupational hazard evaluation to minimize injuries and facilitate return to work (C3, P4, A2) 2. Demonstrate ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and treatment of injured workers (A3)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Small group discussion (SGD)	8	16
Case Based Learning (CBL)	8	16
Clinic	52	104
Practical		
Assessment	10	20
Total	**78**	**156**
Assessment Methods:		
Formative:	**Summative:**	
Logbook maintenance, Case presentation, OSCE, DOPS and Clinical competency assessment,	Sessional Exam (Viva-voce and Practical)	
	End Semester Examination (Viva-voce and Practical)	

Mapping of Assessment with COs:			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Logbook maintenance	x	x	
Case presentation	x	x	
OSCE	x	x	x
DOPS		x	
Competency assessment			x
Sessional examination	x	x	
End Semester Examination	x	x	x
Feedback Process:	Mid-Semester Feedback		
	End-Semester Feedback		
Main Reference:	1. Geriatrics Rehabilitation- Carole Lewis and Jennifer Bottomley 2. Industrial Therapy- Gllenda Key 3. Introduction to Ergonomics- Bridger 4. Ergonomics Design for people at work- Kodak 5. Ergonomics for Therapist-Valerie Berg Rice		
Additional References			

Manipal College of Health Professions								
Name of the Department	Physiotherapy							
Name of the Program	Bachelor of Physiotherapy							
Course Title	**Evidence Based Practice in Physiotherapy**							
Course Code	**PTH4103**							
Academic Year	Fourth							
Semester	VII							
Number of Credits	02							
Course Prerequisite	Basic knowledge of biostatistics and research methods							
Course Synopsis	This module is designed to provide an overview of evidence based practice and its importance in Physiotherapy practice.							
Course Outcomes (COs):	**At the end of the course student shall be able to:**							
CO1	Apply the process of evidence-based practice in physiotherapy (C3)							
CO2	Outline the principles in selecting outcome measures relevant to physiotherapy practice (C2)							
CO3	Identify resources for evidence-based practice in physiotherapy and display the process of evidence synthesis (C3, P1)							
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		
Introduction to evidence-based practice (EBP)	1. Define evidence-based practice (EBP) (C1) 2. Compare and contrast evidence with information (C2) 3. Explain the rationale of EBP (C2) 4. Relate the benefits of EBP to physiotherapy practice (C2) 5. Illustrate the various levels of evidence (C2)	02
Unit 2		
Evidence Synthesis	1. List the electronic databases and sources for retrieving evidence (C1) 2. Outlines the steps involved in searching and retrieving evidence (C2) 3. Display competence in searching and retrieving evidence (P3) 4. Outline the process of critical appraisal (C2)	08
Unit 3		
Implementation of Evidence based	1. Explain the steps involved in evidence-based practice (C2)	16

Content	Competencies	Number of Hours
practice in physiotherapy	2. Explain the process of using evidence in clinical decision making (C2) 3. List the need to use outcome measures in Physiotherapy (C1) 4. List the common outcome measures used in physiotherapy practice under International Classification of Function, disability and health (C1) 5. Outline the process of selecting an appropriate outcome measure (C2) 6. Apply the concepts of EBP and relate it to the clinical practice (through clinical case studies) (C3, P1) 7. List the barriers and facilitators for implementation of evidence-based practice (C1)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	14
Seminar		
Small group discussion (SGD)	07	12
Self-directed learning (SDL)		14
Case Based Learning (CBL)	06	12
Assessment		
Total	**26**	**52**

Assessment Methods:	
Formative:	**Summative:**
Presentations	Sessional Exam (Theory)

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

Feedback Process:	Mid-Semester/ sessional examination
Main Reference:	1. Practical Evidence-Based Physiotherapy by Robert Herbert & Gro Jamtvedt & Kåre Birger Hagen & Judy Mead & Sir Iain Chalmers 2nd Edition (2011) https://doi.org/10.1016/C2009-0-61794-3 2. https://www.csp.org.uk/professional-clinical/clinical-evidence/evidence-based-practice
Additional references	1. Evidence-Based Nursing: The Research Practice Connection By Sarah Jo Brown 4th Edition (2018)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Cardiopulmonary and community physiotherapy skills**
Course Code	**PTH4111**
Academic Year	Fourth
Semester	VII
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy, physiology of cardiovascular, pulmonary and neuromusculoskeletal system, basic exercise physiology and physiotherapeutic skills
Course Synopsis	The module will provide skill training in evaluation and management of people with cardiovascular, pulmonary and neuromusculoskeletal conditions, people with disabilities, older adults and injured workers through practice among peers or simulated patients

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

CO1	Display effective communication skills for client engagement in simulated environment (P3, C2)
CO2	Perform skills in physiotherapy assessment and therapeutic techniques in simulated environment. (P4, C2)
CO3	Explain the rationale of procedural steps of assessment and therapeutic techniques in cardiopulmonary, community, geriatric and industrial physiotherapy. (P2, C2)

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		
Cardiopulmonary Physiotherapy assessment:	1. Perform various assessment techniques involved in cardiopulmonary physiotherapy evaluation including history taking, symptom analysis, observation, palpation, examination to identify the problems (P4, A2) 2. Identify the intensive care monitoring equipment, emergency equipment and organ support equipment(P1)	10
Unit 2		
Cardiopulmonary Physiotherapy	1. Display treatment skills related to Cardiopulmonary conditions (P4, A2):	16

Content	Competencies	Number of Hours
treatment skills	• Bronchial hygiene therapies – Postural drainage and manual techniques, Active Cycle of Breathing Technique, Autogenic drainage, Forced Expiratory Technique, assisted coughing techniques and Positive expiratory pressure, airway suctioning • Lung expansion therapies - Relaxation techniques, Breathing exercises, Incentive Spirometry and Neurophysiologic facilitation of breathing, manual hyperinflation • Therapeutic positioning	
Unit 3:		
Physiotherapy evaluation and management in the community	1. Perform comprehensive physiotherapy evaluation of patients in the community and prepare the patient problem list in ICF format. (P4, A2) 2. Demonstrate physiotherapy skills in facilitating community reintegration of person with disabilities (P4, A2)	5
Unit 4:		
Physiotherapy evaluation and management of older adults	1. Choose tools and perform evaluation of balance, falls, coordination, gait, activities of daily living and cognition among older adults. (P4, A2) 2. Use test batteries to perform fitness evaluation for older adults. (P4, A2) 3. Organize the findings from the test batteries and develop an exercise program for older adults. (P4, A2)	16
Unit 5:		
Ergonomic evaluation	1. Select tools and perform the following: (P4, A2) • Workstation evaluation • Task and risk factor evaluation • Evaluation of manual material handlers • Job demand analysis • Occupational hazard evaluation	5

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	42	84
Revision	10	20

Assessment				
Total		**52**	**104**	
Assessment Methods:				
Formative:	**Summative:**			
OSPE/OSCE	II Sessional Exam (Practical/ OSCE/ OSPE)			
Mapping of Assessment with COs:				
Nature of Assessment		**CO1**	**CO2**	**CO3**
Mid Semester / Sessional Examination 1				
Sessional Examination 2		x	x	x
Presentations				
End Semester Exam				
Feedback Process	Mid-Semester / Sessional examination			
Main References	1. Wilkin's clinical assessment in respiratory care by Al Heuer 2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan Cash, Patricia Downie, DM Innocenti and SE Jackson 3. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics – Jennifer Pryor and Ammani Prasad 4. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice – 5th Edition – Donna Frownfelter and Elizabeth Dean 5. Physiotherapy in respiratory care by Alexandra Hough 6. Physiotherapy in Community Health and Rehabilitation; Waqar Naqvi 7. Senior fitness test; Rikli and Jones 8. Human Factors and Ergonomics; Bridger 9. Ergonomic design for people at work; Kodak			
Additional References	1. Hutchinson's clinical methods by Michael Glynn and William Drake 2. Bate's guide to physical examination and history taking by Uzma Firdaus			

SEMESTER - VIII

COURSE CODE	:	COURSE TITLE
PTH4201	:	Theoretical concepts in Cardiopulmonary Physiotherapy - II
PTH4231	:	Clinical Practice in Cardiopulmonary Physiotherapy - II
PTH4202	:	Theoretical concepts for Physiotherapy in Special Conditions
PTH4232	:	Clinical practice in Physiotherapy for Special Conditions
PTH4203	:	Electrodiagnosis
PTH4251	:	Research proposal and scientific writing
PTH4211	:	Physiotherapy skills in Cardiopulmonary and special conditions
PTH****	:	Program Elective - II

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts in Cardiopulmonary Physiotherapy - II**
Course Code	**PTH4201**
Academic Year	Fourth
Semester	VIII
Number of Credits	02
Course Prerequisite	Basic knowledge in applied anatomy and physiology of cardio-vascular pulmonary system
Course Synopsis	The module is intended to provide the student with an opportunity to acquire knowledge of physiotherapy management in cardiovascular and respiratory disease.

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

CO1	Compare and contrast various physiotherapy approaches for pulmonary and cardiovascular disorder (C4)
CO2	Explain the features and complication of cardiovascular and pulmonary disorders and relate it to physiotherapy interventions (C2)
CO3	Formulate and develop physiotherapy treatment plan for pulmonary and cardiovascular disorder (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Health-related physical fitness	1. List the components of health-related physical fitness(C1) 2. Summarize pre-exercise evaluation (exercise preparticipation health screening process, Informed consent, Pre-test instruction, medical history and cardiovascular disease risk factor assessment) (C2) 3. List the indications, contraindications, precautions and exercise termination criteria for health-related physical fitness testing 4. List the instruments and outline the protocols used in exercise testing (C2) 5. List the functional strength and endurance test(C1) 6. Explain anthropometric evaluation (C2)	5

Content	Competencies	Number of Hours
	7. Explain frequency, intensity, type, time and progression for exercise prescription (C2) 8. Recalls the principles of strength training(C1) 9. Outline the modes of exercise training for endurance, strength and flexibility (C2)	
Unit 2:		
Physiotherapy in respiratory diseases	1. Explain physiotherapy management in the following conditions(C2) • Obstructive pulmonary disease (COPD, Bronchial Asthma, Bronchiectasis, Cystic Fibrosis) • Restrictive pulmonary disease (Occupational lung diseases, Interstitial lung disease, Neuromuscular diseases, Skeletal abnormalities) • Infectious lung disease (Pneumonia, Pulmonary TB, Lung Abscess and SARS-CoV-2 • Pleural disorders	5
Unit 3:		
Physiotherapy in surgical conditions	1. Discuss the preoperative and post-operative physiotherapy management following surgeries (C2): • Thoracic surgeries • Abdominal surgeries • Cardiac surgeries • Vascular surgeries • Surgeries in Cancer	8
Unit 4:		
Pulmonary rehabilitation	1. Define pulmonary rehabilitation(C1) 2. Explain the components of Pulmonary rehabilitation (C2) 3. List the indications and precautions for exercise in pulmonary rehabilitation (C1) 4. Explain the methods, indications, contraindications and exercise termination criteria for functional exercise capacity evaluation - 6minute walk test, incremental shuttle walk test (C2)	2
Unit 5:		
Cardiac rehabilitation	1. Define Cardiac rehabilitation (C1) 2. Explain the components and phases of a cardiac rehabilitation program (C2) 3. List the indications and explain the precautions for exercise in cardiac rehabilitation (C2)	2
Unit 6:		
Physiotherapy in peripheral vascular disease	1. List the various types of peripheral vascular diseases (PVD) (arterial, venous, lymphatic) (C1) 2. Discuss physiotherapy management for people	2

Content	Competencies	Number of Hours
	with PVD (C2)	
Unit 7:		
Physiotherapy in Cancer rehabilitation	1. Define cancer rehabilitation (C1) 2. List the indications and precautions for exercise in cancer rehabilitation (C1) 3. Discuss the physiotherapy management for people with cancer (C2)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Total	**26**	**52**

Assessment Methods:	
Formative:	**Summative:**
Quiz/ presentations	Mid Semester/Sessional Exam (Theory)
	End Semester Exam (Theory)

Mapping of Assessment with COs:

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

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics – Jennifer Pryor and Ammani Prasad 2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan Cash, Patricia Downie, DM Innocenti and SE Jackson 3. Egan's Fundamentals of Respiratory Care: Wilkins Robert 4. Physiotherapy for Respiratory and Cardiac Problems: Webber Barbara A ;Pryor Jennifer A 5. S. Ammani Prasad, Juliette Hussey,Jo Campling .Paediatric Respiratory Care. A guide for physiotherapists and health professionals. Springer, Boston, MA. 6. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 10th Ed, Wolters Kluwer Health Inc 7. Exercise Leadership in Cardiac Rehabilitation: An Evidence-Based Approach by Morag Thow; Wiley, (2004) 8. Cardiovascular and Pulmonary Physical Therapy-An evidence based approach- McGraw Hill Education_2018
Additional References	1. Principles & Practice of Cardiopulmonary Physical Therapy by Donna Frownfelter PT DPT MA CCS RRT FCCP and Elizabeth Dean PhD PT 2. Hough's evidence-based practice of cardiopulmoanry physiotherapy 3. Wilkin's clinical assessment in respiratory care by Al Heuer

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical Practice in Cardiopulmonary Physiotherapy - II**
Course Code	**PTH4231**
Academic Year	Fourth
Semester	VIII
Number of Credits	2
Course Prerequisite	Basic knowledge on applied anatomy and physiology of various medical and surgical disorders
Course Synopsis	The module will provide information about principles of physiotherapy assessment and management of people with medical and surgical conditions using contemporary techniques.

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

CO1	Display the ability to apply the principles of physiotherapy evaluation and management of people with medical and surgical conditions (C2 P4 A2)
CO2	Builds a rapport with patients, caregivers, peers and health care professionals and prepare to work as team member (C3, P4, A2)
CO3	Demonstrate and displays ethical behaviour during assessment and treatment of people with medical and surgical conditions (C2, 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				

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Physiotherapy assessment and management in medical and surgical conditions	1. Perform physiotherapy assessment in clients with cardio-vascular and pulmonary disorders. (C3, P4, A3) 2. Displays the ability to interpret investigations for cardiovascular and pulmonary conditions (C3, P4) 3. Organizes problem list (P4, A3) 4. Plan short term and long-term goals based on the evaluation findings (C3, A3) 5. Discuss health related information with clients, caregivers, peers and health care professionals (C2, A2 P2) 6. Prepares to work as a member in rehabilitation team (P2, A3) 7. Plan and perform appropriate treatment	78

Content	Competencies	Number of Hours
	techniques (C3, P4, A3) **8.** Displays ethical and professional behavior (Autonomy, Beneficence and Justice) during assessment and treatment of clients. (C3, P4, A3)	
Unit 2		
Health-related physical fitness	1. Displays pre-exercise evaluation- exercise pre-participation health screening process and Identify risk factor (P4, A2) 2. Perform anthropometric evaluation techniques (P3, A2) 3. Perform functional strength, flexibility and endurance tests (P3, A2) 4. Display the methods of exercise training for endurance (cardiorespiratory and muscular), strength and flexibility (P4, A2)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)	8	16
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)	8	16
Clinic	52	30
Practical		
Revision		
Assessment	10	
Total	**78**	**62**

Assessment Methods:	
Formative:	**Summative:**
Logbook maintenance, Case presentation, OSCE, DOPS and Clinical competency assessment	II Sessional Exam (Viva-voce and Practical)
	End Semester Exam (Viva-voce and Practical)

Mapping of Assessment with COs:					
Nature of Assessment	**CO1**	**CO2**	**CO3**		
Sessional Examination 2	x	x	x		
Presentations	x				
End Semester Exam	x	x	x		

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback

Main References	1. Wilkin's Clinical Assessment in Respiratory Care by Al Heuer, 8th Ed; Elsevier 2. Bate's Guide to physical examination and history taking by Lynn Bickley; 11th Ed; Wolters Kluwer 3. Cardiorespiratory Physiotherapy: Adults and paediatrics by Eleanor Main & Linda Denehy; 5th Ed, Elsevier 4. Surgical Critical Care Hand Book: Guidelines for Care of the Surgical Patient in the ICU by Ali Jameel; World Scientific (2016) 5. Exercise Leadership in Cardiac Rehabilitation: An Evidence-Based Approach by Morag Thow; Wiley, (2004) 6. Egan's Fundamentals of Respiratory Care: Wilkins Robert 7. ACSM's Guidelines for Exercise Testing and Prescription by Linda S Pescatello et al; 10th Ed, Wolters Kluwer Health Inc
Additional References	1. O'Sullivan Physical Rehabilitation 7th edition By Sullivan, F.A. Davis 2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists. in Patricia A Downie (editor) Publisher: Philadelphia: Lippincott.

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Theoretical concepts for Physiotherapy in Special conditions**
Course Code	**PTH4202**
Academic Year	Fourth
Semester	VIII
Number of Credits	02
Course Prerequisite	Basic knowledge of anatomy, physiology, pathology of human body
Course Synopsis	This module is designed– 1 To provide the fundamental knowledge regarding the evaluation and management of issues related to women's health across lifespan 2. To provide the fundamental knowledge of early intervention in children at risk of developmental disabilities 3. To understand the evaluation and the management of conditions causing long-term functional limitation or morbidity

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Explain the Physiotherapy management of non-communicable diseases based on evidence (C3)
CO2	Describe the exercise prescription in adolescence, pregnancy and menopause (C2)
CO3	Explain the Physiotherapy management in urogynecological cancers, pelvic floor dysfunction including genital prolapse; during pregnancy, child birth and postpartum period (C3)
CO4	Explain the risk factors for childhood disability and physiotherapy management in children with developmental disability(C3)

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							

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Exercise prescription in Adolescent, Pregnant and Menopausal women	1. Explain the exercise prescription in adolescence, pregnancy and menopause (C2)	2
Unit 2		

Content	Competencies	Number of Hours
Physiotherapy in antenatal, natal and postnatal period.	1. Explain the Physiotherapy management of health related issues during pregnancy and postpartum period (C3) 2. Explain the role of Physiotherapy during childbirth (C2)	4
Unit 3		
Physiotherapy in Menstrual disorders	1. List the types of menstrual disorders (C1) 2. Explain the physiotherapy management of Polycystic Ovarian Syndrome (C2)	1
Unit 4		
Physiotherapy in urogynecological cancers and pelvic floor dysfunction	1. Explain the physiotherapy assessment (Preoperative and postoperative) and management following urogynecological cancers (C3) 2. Explain the role of Physiotherapy in pelvic floor dysfunction and genital prolapse in women (C3)	3
Unit 5		
Physiotherapy evaluation and exercise prescription for children in community	1. Explain various risk factors for developmental disability in children (C2) 2. Explain basic neuromotor observations of high risk infant and therapeutic intervention for high risk infants(C2) 3. Explain the role of physiotherapist in early intervention program for children at risk of developmental disabilities (C2) 4. List national programs on child health (C1) 5. List outcome measures on developmental assessment based on ICF classification (C1) 6. Define developmental surveillance and developmental screening (C1)	2
Unit 6		
Health Promotion in non-communicable diseases	1. List the risk factors of non-communicable diseases (C1) 2. Discuss the physiotherapy programs for management of NCDs(C2) • Obesity • Hypertension • Diabetes Mellitus • Lipid disorders	3
Unit 7		
Sport for disabled people:	1. List the sports for individuals with disablility (C1) 2. Elaborate the sports specific training in individuals with disablility (C2) 3. Discuss the injury prevention strategies in individuals with disablility (C2)	1

Content	Competencies	Number of Hours
Unit 8		
Polio myelitis and Post-Polio Syndrome	1. Discuss the pathophysiology of polio and post-polio syndrome (C2) 2. Discuss the physiotherapy management for individuals with PPRP and PPS (C2)	2
Unit 9		
Amputations	1. Discuss the physiotherapy management for individuals following amputation (C2) 2. Discuss the strategies of stump care and prosthetic rehabilitation (C2)	2
Unit 10		
Hansen's Disease	1. Explain the pathophysiology, classification and clinical features of Hansen's Disease (C2) 2. Discuss the physiotherapy management for Hansen's disease(C2)	2
Unit 11		
Burns	1. Explain the role of physiotherapy in acute and long term management of burns (C2)	2
Unit 12		
Wound healing	1. Explain the role of physiotherapy in acute care and facilitation of wound healing (C2) 2. Explain the role of physiotherapy in acute and long term management following plastic surgical procedure (C2)	2

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	32
Seminar	10	10
Small group discussion (SGD)	**3**	
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment		
Total	**26**	**42**

Assessment Methods:	
Formative:	**Summative:**
Seminars and presentation	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	
Sessional Examination 2						
Presentations		x	x	x	x	
End Semester Exam		x	x	x	x	
Feedback Process:	Mid-Semester Feedback					
	End-Semester Feedback					
Main Reference:	1. Second edition of *Physiotherapy in Obstetrics and Gynaecology by* Jill Mantle BA FCSP DipTP 2. Women's Health : a textbook for Physiotherapists by Ruth Sapsford, Joanne Bullock- Saxton, Sue Markwell 3. Physical Medicine and Rehabilitation by Braddom's 4. DeLisa's Physical Medicine and Rehabilitation, 5th edition, Lippincott Wiliams and wilkins 5. ACSM exercise testing and prescription- 10th edition 6. Pediatric Physical Therapy, 5th Edition edited by Jan S. Tecklin.					
Additional References						

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Clinical practice in Physiotherapy for special Conditions**
Course Code	**PTH4232**
Academic Year	Fourth
Semester	VIII
Number of Credits	2
Course Prerequisite	1. Student should have knowledge of applied anatomy, applied physiology, exercise therapy and electrotherapy.
Course Synopsis	The module will provide information about principles of physiotherapy management in women's health paediatrics, post-polio residual syndrome (PPRS), burns, amputations, Hansen's disease and life style diseases. The module will enable students to understand the basics of prescriptions, selection, preparations of orthotic devices and training with same.

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

CO1	Demonstrate knowledge and display skills in examination and management in special conditions (women's health, paediatrics, PPRS, burns, amputations, Hansen's disease and lifestyle diseases). (C2, P2, A2)
CO2	Display verbal and written communication with patients, caregivers, peers and health care professionals and prepares to work as team member (P2, A2)
CO3	Practices ethical principles during assessment and treatment in special conditions (A2)

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		
Physiotherapy evaluation and management in Obstetrics and Gynaecology	1. Outline specific evaluations and construct exercises for clients during adolescence, pregnancy, postpartum and menopause (C2, P3, A2) 2. Explain exercise program for women with pelvic floor dysfunction and post urogynecological surgery (C2, P2, A2) 3. Displays ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and management of women during postpartum period and with	78

Content	Competencies	Number of Hours
	gynaecological disorders (A2)	
Unit 2		
Physiotherapy evaluation and management of children	1. Outline physiotherapy evaluation and discuss management for school-going children. (C2, P2, A2) 2. Display knowledge in physiotherapy documentation and parent education (C2, P2, A2) 3. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and management of children with and without disabilities (A2)	
Unit 3		
Physiotherapy evaluation and management for health promotion in lifestyle disorders	1. Outline assessment and intervention programs for people with following lifestyle disease (C2, P2 A2) • Obesity • Hypertension • Diabetes Mellitus • Lipid disorders 2. Display ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and management of individuals with lifestyle disorders (A2)	
Unit 4		
Physiotherapy evaluation and management for amputation, Hansen's diseases, burns and wounds	1. Outline physiotherapy evaluation and management in pre-amputation, post-amputation and prosthetic stages of rehabilitation. (C2, P2 A2) 2. Outline physiotherapy evaluation and management for signs and symptoms and complications of Hansen's diseases. (C2, P2 A2) 3. Outline physiotherapy evaluation and management of lymphedema. (C2, P2 A2) 4. Outline physiotherapy evaluation and management of burns under early mobilization at acute care set-up; scars and deformities in recovered stages. (C2, P2 A2) 5. Outline physiotherapy evaluation and management of wound. (C2, P2 A2) 6. Displays ethical and professional behaviour (Autonomy, Beneficence and Justice) during assessment and management of individuals with post-polio syndrome, amputation, Hansen's diseases and burn (A2)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)	8	16
Self-directed learning (SDL)	8	
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic	52	52
Practical		
Revision		
Assessment	10	20
Total	**78**	**88**

Assessment Methods:	
Formative:	**Summative:**
Presentations	II Sessional Exam (Viva-voce and Practical)
	End Semester Exam (Viva-voce and Practical))

Mapping of Assessment with COs:			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Sessional Examination 2	x	x	x
Presentations	x	x	x
End Semester Exam	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Second edition of *Physiotherapy in Obstetrics and Gynaecology by* Jill Mantle BA FCSP DipTP 2. Women's Health : a textbook for Physiotherapists by Ruth Sapsford, Joanne Bullock- Saxton, Sue Markwell 3. Physical Medicine and Rehabilitation by Braddom's 4. DeLisa's Physical Medicine and Rehabilitation, 5th edition, Lippincott Wiliams and wilkins 5. ACSM exercise testing and prescription- 10th edition 6. Pediatric Physical Therapy, 5th Edition edited by Jan S. Tecklin.
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Electrodiagnosis**
Course Code	**PTH4203**
Academic Year	Fourth
Semester	VIII
Number of Credits	03
Course Prerequisite	Basic knowledge of the anatomy, physiology and clinical conditions of the neuromuscular system
Course Synopsis	This module is designed to enable the students to gain knowledge in electrophysiology and electrodiagnostic techniques used in identifying neuromuscular disorders

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

CO1	Summarize electrophysiology relevant to electrodiagnosis. (C2)
CO2	List the electrodiagnostic tests, its indications, merits and demerits (C1)
CO3	Explain the test procedures, analyze parameters and interpret the findings (C4)
CO4	Distinguish the findings between neurogenic and myogenic disorders. (C4)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Basics of electrodiagnosis	1. Summarize the anatomy and physiological properties of motor unit, muscle spindle, Golgi tendon organ, nerves, neuromuscular junction and muscles (C2) 2. Explain generation and propagation of membrane potential and its response to electrical currents (C2) 3. Explain reflex action and its role in control of the normal movement. (C2) 4. List the electrodiagnostic tests and indications for neurological disorders(C1)	4
Unit 2:		
Instrumentation for electro diagnostic testing	1. Illustrate the panel diagram of an electrodiagnostic equipment (C3) 2. Classify types of electrodes and select electrodes based on electrodiagnostic study (C3)	4

Content	Competencies	Number of Hours
	3. Define and explain filter, amplifier, signal averager, gain and sweep speed. (C2) **4.** Explain types of display and stimulators used in electrodiagnostic equipment (C2)	
Unit 3:		
Nerve conduction studies (NCS)	1. Define nerve conduction studies and explain the principles of nerve conduction studies. (C2) 2. Explain the indications and disadvantages of NCS (C2) 3. Explain the factors affecting nerve conductions studies (C2) 4. Outline the procedure for sensory and motor nerve conduction studies of median, radial, ulnar, femoral and common peroneal nerves (C2)	6
Unit 4		
Reflex studies	1. Define and outline the procedure for H Reflex, F wave, blink reflex, axon reflex (C2) 2. Explain the indications and clinical implications of reflex studies. (C2) 3. List the parameters and interpret late responses(C2) 4. Compare and contrast the characteristics of H reflex and F wave (C2)	6
Unit 5		
Repetitive nerve stimulation (RNS)	1. What is RNS, list its indications and types (C2) 2. Explain the procedure and interpretation of RNS studies (C2)	3
Unit 6		
Introduction to evoked potentials	1. Define evoked potentials(C1) 2. Outline the types and indications of evoked potentials (C2) 3. List the advantages of evoked potential over NCS (C1)	2
Unit 7		
Electromyography (EMG)	1. Define EMG (C1) 2. Explain the Indications and Disadvantages of EMG study(C2) 3. Outline the Stages of electromyography recording (C2) 4. Explain the procedure for performing EMG(C2) 5. Explain normal and abnormal potentials recorded in EMG studies(C2) 6. Distinguish neurogenic and myogenic potentials using EMG findings(C4) 7. List the indications and uses of single fiber EMG and surface EMG (C1)	6
Unit 8		
Electromyography Biofeedback:	1. Define Electromyography Biofeedback (C2) 2. Explain the mechanism, indications, advantages and disadvantages of EMG biofeedback (C2)	4

Content	Competencies	Number of Hours
	3. Outline the procedure for EMG Biofeedback (C2)	
Unit 9		
Classification of nerve lesions based on electro diagnostic studies	1. Recall types of nerve lesions in traumatic (Neuropraxia, Axonotmesis, Neurotmesis) and non-traumatic (axonal degeneration, segmental demyelination) conditions (C1) 2. Analyze SD curve, FG test, chronaxie, rheobase and nerve conduction studies (C4)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):						
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**				
Lecture	26	52				
Seminar	06	12				
Small group discussion (SGD)	03	06				
Self-directed learning (SDL)	04					
Total	**39**	**70**				
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. Clinical Neurophysiology (3rd edition)- U K Mishra 2. Clinical Electrophysiology (3rd edition)- Andrew J Robinson, Lynn Synder-Mackler 3. Electrodiagnosis of nerve and muscle: principles and practice (4th Edition)-Jun Kimura					

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Research protocol and scientific writing**
Course Code	**PTH4251**
Academic Year	Fourth
Semester	VIII
Number of Credits	4
Course Prerequisite	Basic Knowledge in research methodology and Bio statistics
Course Synopsis	The module is intended to provide knowledge to the student in planning and preparation of a research proposal.

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

CO1	To develop a research question (C3)
CO2	To organize a research protocol (C3)
CO3	To identify the ethical issues in implementation of research (C3)
CO4	To understand and apply the features of scientific writing (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	

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to research proposal	1. What is research protocol? (C1) 2. Outline the sections of a research protocol (C2) 3. Identify the purpose, objectives of the research prop (C3) 4. Identify the need and list the sources of funding for research (C3)	3
Unit 2		
Literature review	1. Identify and perform a literature search in the search engine and electronic database. (C3, P4) 2. Summarize the literature and identify the gaps. (C3)	3
Unit 3		
Developing a research question	1. What is a research question? (C1) 2. Outline the steps to develop the research question (C2) 3. Develop a research question in PICO format (C3)	10
Unit 4		

Content	Competencies	Number of Hours
Formulating and drafting a research proposal	• Choose the appropriate research design for the research question being developed? (C3) • Develop a detailed a research protocol (C3)	15
Unit 5		
Ethics in research	1. Recall principle of research ethics (C1) 2. Identify ethical considerations in the research protocol. (C3)	4
Unit 6		
Scientific writing	1. What are scientific writings (C1) 2. Explain the principles to scientific writing 3. Explain the importance of effective paraphrasing? (C2) 4. Define plagiarism and identify its consequences (C3) 5. Summarize referencing styles and utilize a citation manager (C2, P3)	13
Unit 7		
Paraphrasing and Plagiarism in scientific writing	1. What is paraphrasing? (C1) 2. Define plagiarism (C1) 3. Apply citation from sources correctly (C3)	4

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	5	15
Seminar		
Small group discussion (SGD)	26	52
Self-directed learning (SDL)	13	39
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical		
Revision		
Assessment	8	24
Total	**52**	**156**

Assessment Methods:	
Formative:	**Summative:**
Presentations	Mid Semester/Sessional Exam (Protocol presentation)

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

Feedback Process	Presentation/ Mid-Semester/ Sessional examination
Main References	1. Research for Physiotherapists: Project Design and Analysis by Hicks Carolyn M
Additional References	

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Physiotherapy skills in Cardiopulmonary and special conditions**
Course Code	**PTH4211**
Academic Year	Fourth
Semester	VIII
Number of Credits	02
Course Prerequisite	Basic knowledge on applied anatomy and physiology
Course Synopsis	The module is designed to: Enable students to monitor and apply physiotherapy strategies to people with surgical, medical and special conditions

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Display effective communication skills for patient engagement (P3 A2)
CO2	Display exercise testing and training for lifestyle diseases and special conditions (P3 A2)
CO3	Perform functional testing and exercise training for cardiovascular and pulmonary rehabilitation (P4, A2)

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						

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1:		
Physiotherapy evaluation and exercise prescription in women	1. Perform specific evaluations and prescribe exercises for clients during adolescence, pregnancy, postpartum and menopause (P3, A2) 2. Explain exercise program for women with pelvic floor dysfunction and post urogynecological surgery (P2, A1)	8
Unit 2:		
Physiotherapy in lifestyle disease	1. Develop assessment and intervention programs for people with following lifestyle disease (P3 A2) ▪ Obesity ▪ Hypertension ▪ Diabetes Mellitus ▪ Lipid disorders	4

Content	Competencies	Number of Hours
Unit 3:		
Physiotherapy evaluation and exercise prescription for children in community	1. Display evaluation techniques and explain the exercise program for children (P2, A2) 2. Display group exercise program for children (P2, A2)	3
Unit 4		
Health-related physical fitness	1. Display the process of preparticipation health screening (P2, A2) 2. Display anthropometric evaluation techniques(P3,A2) 3. Perform functional strength, flexibility and endurance (cardiorespiratory and muscular) tests (P3, A2) 4. Display the methods of exercise training for endurance (cardiorespiratory and muscular), strength and flexibility (P3, A2)	20
Unit 5		
Pulmonary rehabilitation	1. Perform functional capacity evaluation (6-minute walk test, incremental shuttle walk test, uunsupported upper limb exercise (UULEX) test and 6-min pegboard and ring test (6PBRT)) and training in pulmonary rehabilitation (P4, A2) 2. Measure Outcomes in pulmonary rehabilitation- Modified medical research council (mMRC) dyspnoea scale, Borg rating of perceived exertion (RPE) scale, sputum colour chart) (P3)	5
Unit 6		
Cardiac Rehabilitation	1. Display monitoring and assessment techniques for people with cardiac disease (P3 A2) 2. Perform functional capacity evaluation in cardiac rehabilitation (P4, A2) 3. Measure Outcomes in cardiac rehabilitation (NYHA, VAS for angina) (P4 A2)	5
Unit 7		
Peripheral vascular disease (PVD)	1. Perform special tests for vascular function (Ankle brachial index, Claudication distance, Buerger test) (P3, A2) 2. Display Exercises for peripheral vascular disease (P3, A2)	3
Unit 8		
Physiotherapy in lymphedema	1. Perform assessment and display exercises for lymphedema (P4, A2)	1
Unit 9		
Stump care and wound healing	1. Display stump evaluation, stump care and bandaging (P3, A2) 2. Perform desensitization methods for phantom limb (P4, A2) 3. Display the wound measurement methods (P3, A2)	3

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		
Case Based Learning (CBL)		
Clinic		
Practical	26	52
Revision	26	
Assessment		
Total	**52**	**52**

Assessment Methods:	
Formative:	**Summative:**
OSPE/OSCE	**Sessional Examination (OSCE/OSPE)**

Mapping of Assessment with COs:			
Nature of Assessment	**CO1**	**CO2**	**CO3**
Sessional Examination 2	x	x	x
Presentations			
End Semester Exam			

Main Reference:	1. Cardiovascular and Pulmonary Physical Therapy: Evidence to Practice by Donna Frownfelter & Elizabeth Dean; 5th Ed, Elsevier (2012) 2. Essentials of Cardiopulmonary Physical Therapy by Hillegass Ellen; 4th Ed, Elsevier (2017) 3. Cardiopulmonary Physical Therapy: A Guide to Practice by Irwin Scot &Tecklin Jan Stephen; 4th Ed, Mosby (2004) 4. Physiotherapy in Respiratory Care: An Evidence based approach to Respiratory and Cardiac Management by Alexandra Hough; 3rd Ed, Nelson Thornes Ltd (2001) 5. Second edition of *Physiotherapy in Obstetrics and Gynaecology by* Jill Mantle BA FCSP DipTP 6. Women's Health : a textbook for Physiotherapists by Ruth Sapsford, Joanne Bullock- Saxton, Sue Markwell 7. Physical Medicine and Rehabilitation by Braddom's 8. DeLisa's Physical Medicine and Rehabilitation, 5th edition, Lippincott Wiliams and wilkins 9. ACSM exercise testing and prescription- 10th edition 10. Tidy's Physiotherapy by Porter (Author) 11. Physical Medicine and Rehabilitation by susan sullivan 12. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan Cash, Patricia Downie, DM Innocenti and SE Jackson 13. Cash's Textbook of General Medical and Surgical Conditions for Physiotherapists by Joan E. Cash (Author), Patricia A. Downie (Editor)
Additional References	**1.** Cardiorespiratory Physiotherapy: Adults and Paediatrics: Eleanor Main & Linda Denehy; 5th Ed, Elsevier

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Disability & Health**
Course Code	**PTH4241**
Academic Year	Fourth
Semester	VIII
Number of Credits	3
Course Prerequisite	Basic knowledge on disability and concepts of health and diseases.
Course Synopsis	The module is designed to enable students to study disability and health under the domains of education, ethics, environment and law.

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

CO1	Explain the need for disability studies, and understand the issues encountered by individuals with disabilities (C2)
CO2	Relate multiple domains and intersectionality of disability (C2)
CO3	Identify the role of physiotherapy in achieving the goals of social justice and equality for individuals with disabilities (C3)

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		x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to disability and health	1. Relate determinants of health, health risk behaviours with disabilities (C2) 2. Outline the measures for disability and its burden (Permanent Physical Impairment, International Classification of Functioning Disability and Health, ICF-CY, DALY, QALY, Health Impact Assessment). (C2)	05
Unit 2		
Rehabilitation team for individuals with disabilities	1. Explain and identify the role of interdisciplinary and interprofessional team members in reintegration of individuals with disabilities. (C3)	03
Unit 3		
Disability from the perspectives of humanities and social	1. Relate to the concepts of ableism, inclusion, inclusive society, disability community and intersectionality (C2)	03

Content	Competencies	Number of Hours
sciences	2. Ethical principles 3. Infer from the ethical dilemmas in the field of disability studies including language to use about disability; good/bad disability organizations (C2)	
Unit 4		
Legislation and disability	1. Outline the existing laws related to individuals with disability in the context of health and welfare (C2)	03
Unit 5		
Culture, media and disability	1. Explain the role of culture and its influence on health and disability (C2) 2. Summarize the role of media and its influence on health and disability. (C2)	03
Unit 6		
Intersectionality within disability	1. What is health inequity? (C1) 2. Explain the interplay of race, gender and disability to the Indian Context (C2)	04
Unit 7		
Inclusive education	1. Outline the role of rehabilitation professionals in inclusive education (C2)	03
Unit 8		
Health and built environment: Perspectives of a Physiotherapist	1. Explain the influence of environment on health and behaviour of individuals with disabilities. (C2) 2. Identify active neighbourhoods, active built environments, and active transportation (C2)	07
Unit 9		
Disability and disaster management	1. Summarize types of disasters including natural and man-made disasters. (C2) 2. Discuss the effects of geopolitical and climate changes on individuals with disability (C2) 3. Explain the role of physiotherapy in disaster preparedness, response and recovery including concept of early rehabilitation and community-based rehabilitation in conflict and disaster-prone areas (C2)	08

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	13	26
Seminar	7	14
Small group discussion (SGD)	5	5
Self-directed learning (SDL)	6	
Problem Based Learning (PBL)		
Case Based Learning (CBL)	8	

Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**45**

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**
Mid Semester / Sessional Examination 1	x	x	x
Presentations	x	x	x
End Semester Exam	x	x	x

Feedback Process	Mid-Semester Feedback
	End-Semester Feedback
Main References	1. Goodley, Dan. Disability Studies: an Interdisciplinary Introduction. SAGE, 2011. 2. Ghai, Anita. Disability in South Asia: Knowledge and Experience. SAGE, 2018 3. The Social Construction of Disability"; from Wendell, Susan. The rejected body: Feminist philosophical reflections on disability. Routledge, 2013 4. The role of physical therapists in disaster management-WCPT (WORLD PHYSIOTHERAPY) report
Additional References	1. Chataika, Tsitsi, et al. '"What Kind of Development Are We Talking about?' : a Virtual Roundtable with Tsitsi Chataika, Nilika Mehrotra, Karen Soldatic and Katerina Kolarova ."Somatechnics, 2016, pp. 142–158., doi: https://doi.org/doi:10.3366/soma.2016.0188 2. Stella Young: I'm not your inspiration: https://www.youtube.com/watch?v=8K9Gg164Bsw&list=PLw7uuf2mbzzHFxLIy8Lv8bpp3YRkJw2Mr&index=5&t=0s 3. Rose Eveleth in Wired: It's Time to Rethink Who's Best Suited for Space Travel: https://www.wired.com/story/its-time-to-rethink-whos-best-suited-for-space-travel/

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Cancer rehabilitation**
Course Code	**PTH4242**
Academic Year	Fourth
Semester	VIII
Number of Credits	03
Course Prerequisite	Basic knowledge in applied anatomy, physiology ad pathology of systems
Course Synopsis	This module will enable the student to • Gain the knowledge on principles and guidelines in the area of cancer rehabilitation providing effective strategies to rehabilitate people with cancer. • Identify differences in various types of cancers with respect to medical and rehabilitation management. • Understand about medical treatment related sequelae and their rehabilitation implications in people with cancer.

Course Outcomes (COs): **At the end of the course student shall be able to:**	
CO1	Describe the pathophysiological aspects and classification for different types of cancers (C2)
CO2	Organise the evaluation procedures in cancer rehabilitation (C3)
CO3	Plan a physiotherapy program in cancer rehabilitation based on evidence (C3)
CO4	Explain palliative care in cancer rehabilitation (C2)

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

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

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Unit 1		
Introduction to cancer	1. Summarize the epidemiology of cancer(C2) 2. List the risk factors of cancer(C1) 3. Name the connective tissues commonly affected in cancer (C1) 4. Outline the pathological process in cancer (C2)	06
Unit 2		
Types of cancers	1. Classify cancer (C2) 2. Explain types and subtypes of cancers	04

Content	Competencies	Number of Hours
	involving head, neck, breast, CNS, spinal Cord, GIT, genito-urinary system, bone, skin and blood(C2)	
Unit 3		
Medical and surgical management of cancer	1. Classify the types and explain the uses and side effects of chemotherapy and radiation therapy (C2) 2. Recall types of surgery and associated complications. (C1)	06
Unit 4		
Physiotherapy in cancer rehabilitation	1. Define cancer rehabilitation (C1) 2. List and outline the role of team members in cancer rehabilitation(C2) 3. Organize the physiotherapy assessment for cancer rehabilitation (C3) 4. List short term and long-term goals of cancer rehabilitation (C1) 5. Outline the role of physiotherapy in hospital setting (C2) 6. Explain the physiotherapy management for sequelae of medical and surgical complications in cancer rehabilitation (C2) 7. Develop an evidence-based exercise program in cancer rehabilitation (C3)	12
Unit 5		
Cancer related lymphedema	1. Enumerate the etiological factors causing cancer related lymphedema (C1) 2. Explain the stages of cancer-related lymphedema (C2) 3. Explain the evidence-based treatment options for cancer related lymphedema (C2)	04
Unit 6		
Cancer related fatigue	1. List the factors causing cancer related fatigue (C1) 2. Explain the physiological basis for cancer related fatigue 3. Outline the methods for evaluating cancer related fatigue (C2) 4. Summarise and select treatment strategies for cancer related fatigue (C2)	04
Unit 7		
Palliative care in oncology	1. What is palliative care? (C1) 2. Outline end of life care in cancer rehabilitation (C2) 3. Explain the role of physiotherapy in palliative care (C2)	03

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture	26	52
Seminar	04	
Small group discussion (SGD)	02	
Self-directed learning (SDL)		
Problem Based Learning (PBL)	05	10
Case Based Learning (CBL)	02	04
Clinic		
Practical		
Revision		
Assessment		
Total	**39**	**66**

Assessment Methods:	
Formative:	**Summative:**
Unit Test	Mid Semester Examination/ Sessional Examination
Quiz	End Semester Examination
Viva	
Assignments/Presentations	

Mapping of Assessment with COs:				
Nature of Assessment	**CO1**	**CO2**	**CO3**	**CO4**
Mid Semester / Sessional Examination 1	x	x	x	
Presentations	x	x	x	
End Semester Exam	x	x	x	x

Feedback Process:	Sessional Examination End Semester Examination
Main Reference:	1. Harsh Mohan, Textbook of Pathology, 6th Edition. 2. Robbins Basic Pathology, 9th Edition 3. Cancer Rehabilitation: Principles and Practice. 2nd Edition Michael D. Stubblefield. Springer Publishing Company 4. Cancer Rehabilitation: Principles and Practice. Neil MacDonald. Demos Medical, 2009, New York.

SEMESTER - IX
(Internship)

Manipal College of Health Professions	
Name of the Department	Physiotherapy
Name of the Program	Bachelor of Physiotherapy
Course Title	**Internship**
Course code	**Nil**
Academic Year	Fifth
Semester	IX (Duration – 6 months / 26 weeks)
Number of Credits	NA
Course Prerequisite	• The students should have knowledge of Pre-clinical and Clinical courses • The student should have knowledge and skills in assessment, treatment planning and executing physiotherapy interventions for clients/ patients • The student should have knowledge to collect the data sets for their proposed project
Course Synopsis	This course will train the students through clinical rotation and prepare them to execute effective communication skills, physiotherapeutic assessments and interventions safely under supervision. The students will carry out a research project under guidance of faculty

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

CO1	Plan and perform assessment of patients with various medical and surgical conditions (C3, P4, A3)
CO2	Develop and perform evidence based treatment for patient with different abilities, medical and surgical conditions (C3, P4, A2)
CO3	Display professional etiquette and team work with the healthcare team, clients and caregivers(C3, P4 , A3)
CO4	Performs data collection, analyses through appropriate statistics and prepares a project report (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		
CO3		x	x					
CO4			x			x		

Course Content and Outcomes:

Content	**Competencies**	**Number of Hours**
Physiotherapy interventions for Healthy and people with Medical	1. Display ethical and professional etiquettes during interaction with clients, caregivers and professionals (C3, P4, A3)	1248

and Surgical conditions: Age groups: Neonates / paediatrics to Geriatrics Setting: Community, Hospital, Institutions and Industry	2. Prepares to work as a member in prevention and rehabilitation team for people with different abilities (P2, A3) 3. Plan and perform a systematic and detailed assessment of the systems of the body, structure and function in people across ages with different abilities, health conditions in hospital and community settings (C3, P4, A3) 4. Interpret the report of the relevant investigations of people with medical and surgical conditions (C2) 5. Select and measure region / condition specific outcomes (C3, P4) 6. Organize the problem list using international classification of functioning, disability and health framework through continuous evaluation (C3, P4, A3) 7. Analyse the examination findings and plan relevant short term and long-term goals using SMART goal approach based on the evaluation findings (C4, P4, A3) 8. Choose physiotherapy based on evidence and perform treatment techniques under supervision (C3, P4, A3) 9. Explains health related information to clients, caregivers, peers and professionals (C2, A2) 10. Construct relevant home exercise program for patients/caregivers (C2, P3, A2) 11. Organize clinical workflow and document for effective professional and inter-professional communication (C3)	
Research project	1. Performs data collection accurately and documents it (P4, A3) 2. Organises the data carefully in Excel/SPSS/ R software (C3, P4, A3) 3. Analyse data and interpret results (C4) 4. Summarize the findings of research and draws conclusion of the research project (C2) 5. Performs a scientific presentation through appropriate audio visual aids (P4, A3) 6. Explain the work with logical and scientific argument (C5)	

Learning Strategies, Contact Hours and Student Learning Time (SLT):		
Learning Strategies	**Contact Hours**	**Student Learning Time (SLT)**
Lecture		
Seminar		
Small group discussion (SGD)		
Self-directed learning (SDL)		
Problem Based Learning (PBL)		

Case Based Learning (CBL)						
Clinic	1,248				360	
Practical						
Revision						
Assessment						
Total	**1,248**				**360**	
Assessment Methods:						
Formative:					**Summative:**	
Case presentation, Research report presentation					NA	
Mapping of Assessment with COs:						
Nature of Assessment		**CO1**	**CO2**	**CO3**	**CO4**	
Presentations					x	
End Posting Assessment		x	x	x		
Feedback Process:	End Posting Assessment					
	Research project presentation					

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

Sem.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
I	ANA1101	Anatomy -I	3	CO1 CO2							
I	ANA1111	Anatomy Practical - I	2		CO1 CO2						
I	PHY1101	Physiology -I	2	CO1 CO2 CO3 CO4							
I	PTH1101	Theoretical concepts in Basics of Exercise Therapy -I	2	CO1 CO2 CO3 CO4							
I	PTH1111	Practical in Basics of Exercise Therapy-I	2	CO2 CO3 CO4 CO5	CO1 CO2 CO3 CO4 CO5			CO1			
I	PTH1102	Biophysics and Basics of electrotherapy	3	CO1 CO2 CO3 CO4							
I	PTH1123	Foundations of Professional practice	2	CO1 CO3	CO3	CO2	CO1			CO2	
I	CSK1001	Communication Skills	2		CO3	CO4		CO1 CO2		CO1 CO2 CO3 CO4	
I	EIC1001	Indian Constitution	2	CO1		CO3	CO2 CO5	CO2	CO4	CO1 CO3 CO5	CO4
		Environmental Studies		CO1 CO2 CO3		CO4 CO5	CO2		CO1 CO3 CO5	CO4	
II	ANA1201	Anatomy -II		CO1							
II	ANA1211	Anatomy Practical - II	2		CO1						
II	PHY1201	Physiology -II	2	CO1 CO2 CO3 CO4							
II	BIC1201	Biochemistry	3	CO1 CO2 CO3 CO4							
II	PTH1201	Theoretical concepts in Basics of Exercise Therapy –II	3	CO1 CO2 CO3							

Sem.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
II	PTH1211	Practical in Basics of Exercise Therapy-II	2	CO2	CO1 CO2 CO3			CO1 CO3			
II	PTH1202	Theoretical concepts in Electrotherapy -I	2	CO1 CO2							
II	PTH1212	Practical in Electrotherapy -I	2		CO1 CO2			CO1 CO2			
II	PTH1203	Applied Anatomy and Applied Physiology	2	CO1 CO2 CO3							
III	PAT2103	Pathology	3	CO1 CO2 CO3 CO4	CO3 CO4						
III	MCB2102	Microbiology	2	CO1 CO2 CO3 CO4	CO4						
III	PTH2101	Biomechanics	3	CO1 CO2							
III	PTH2102	Theoretical concepts in Exercise Therapy -I	3	CO1 CO2							
III	PTH2111	Practical in Exercise Therapy -I	2	CO2	CO1 CO2			CO1			
III	PTH2103	Theoretical Concepts in Electrotherapy -II	2	CO1 CO2							
III	PTH2112	Practical in Electrotherapy -II	2	CO2	CO1 CO2 CO3			CO1			
III	*** ****	Open Elective -I	3	*Open elective is credited, choice-based and is graded as satisfactory / not satisfactory (S/NS). Students make a choice from pool of electives offered by MAHE institution / Online courses as approved by the department*							
IV	PHC2201	Pharmacology	2	CO1 CO2 CO3 CO4							
IV	CPY2201	Clinical Psychology	3	CO1 CO4 CO5 CO6					CO2 CO3 CO5 CO6	CO1 CO2 CO3	
IV	YGA2221	Fundamentals of Yoga Therapy	2	CO1 CO2	CO1 CO2						
IV	PTH2201	Exercise Physiology	3	CO1 CO2							
IV	PTH2202	Theoretical concepts in Exercise therapy -II	3	CO1 CO2							
IV	PTH2211	Practical in Exercise Therapy -	3	CO2	CO1 CO2		CO3	CO1			

Sem.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
		II			CO3						
IV	PTH2203	Ethics, Entrepreneurship and Leadership	2	CO1 CO2 CO3 CO4 CO5 CO6			CO1 CO2 CO3				CO4 CO5 CO6
IV	PTH2231	Clinical Practice	2		CO1 CO2 CO3			CO3			
V	NEP3101	Neurosciences and Paediatrics	3	CO1 CO2							
V	ORT3101	Orthopaedics	2	CO1 CO2							
V	PTH3101	Theoretical concepts in Neurological Physiotherapy -I	3	CO1 CO2 CO3 CO4					CO4		
V	PTH3131	Clinical Practice in Neurological Physiotherapy -I	2	CO1 CO2	CO1 CO2	CO3	CO4	CO3 CO4			
V	PTH3102	Theoretical concepts in Musculoskeletal Physiotherapy -I	3	CO1 CO2 CO3					CO3		
V	PTH3132	Clinical Practice in Musculoskeletal Physiotherapy -I	2	CO1 CO2	CO1 CO2	CO3	CO4	CO3 CO4			
V	PTH3111	Neuromusculoskeletal Skills-I	2	CO3	CO1 CO2 CO3			CO1 CO2			
V	*** ****	Open Elective - II	3	*Open elective is credited, choice-based and is graded as satisfactory / not satisfactory (S/NS). Students make a choice from pool of electives offered by MAHE institution / Online courses as approved by the department*							
VI	BST3201	Biostatistics and Research Methodology	3	CO1 CO2 CO3 CO5	CO4						
VI	MED3201	General Medicine	3	CO1 CO2 CO3							
VI	PTH3201	Theoretical concepts in Neurological physiotherapy -II	2	CO1 CO2 CO3 CO4							
VI	PTH3231	Clinical Practice in Neurological Physiotherapy -II	2	CO1 CO2	CO1 CO2	CO3	CO4	CO3	CO5		
VI	PTH3202	Theoretical concepts in Musculoskeletal	3	CO1 CO2 CO3					CO2		

Sem.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
		Physiotherapy -II									
VI	PTH3232	Clinical Practice in Musculoskeletal Physiotherapy -II	2	CO1	CO1 CO2	CO4	CO3	CO3	CO2	CO4	
VI	PTH3211	Neuromusculoskeletal Skills-II	2	CO2	CO1		CO3	CO1		CO3	
VI	PTH3241	Movement science in Neurorehabilitation	3	CO1 CO2 CO3 CO4					CO3	CO2 CO4	
VI	PTH3242	Pain Sciences	3	CO1 CO2	CO1 CO2			CO3	CO3		
VII	SUR4101	General Surgery	3	CO1 CO2 CO3 CO4							
VII	CMS4101	Community Medicine and Sociology	3	CO1 CO2 CO4	CO1	CO5	CO3	CO3	CO2	CO4	
VII	PTH4101	Theoretical concepts in Cardiopulmonary physiotherapy -I	3	CO1 CO2 CO3 CO4 CO5					CO4 CO5		
VII	PTH4131	Clinical Practice in Cardiopulmonary Physiotherapy -I	2	CO1	CO1 CO3	CO2	CO3	CO2			
VII	PTH4102	Theoretical Concepts in Community Physiotherapy	3	CO1 CO3 CO4 CO5 CO6		CO2 CO5	CO1 CO2		CO4 CO6		
VII	PTH4132	Community Physiotherapy Practice	2	CO1	CO1 CO3	CO2	CO4	CO2			
VII	PTH4103	Evidence based Practice in Physiotherapy	2	CO2					CO1 CO2 CO3	CO1 CO3	
VII	PTH4111	Cardiopulmonary and Community Physiotherapy Skills	2		CO1 CO2 CO3			CO1 CO2 CO3			
VIII	PTH4201	Theoretical Concepts in Cardiopulmonary Physiotherapy -II	2	CO1 CO2 CO3							
VIII	PTH4231	Clinical Practice in Cardiopulmonary Physiotherapy -II	2	CO1	CO1	CO2	CO3	CO2			
VIII	PTH4202	Theoretical Concepts in physiotherapy for Special Conditions	2	CO1 CO2 CO3 CO4					CO1		

Sem.	Course Code	Course Name	Credits	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
VIII	PTH4232	Clinical Practice in Physiotherapy for Special conditions	2	CO1	CO1 CO2		CO3	CO3	CO2		
VIII	PTH4203	Electrodiagnosis	3	CO1 CO2 CO3 CO4							
VIII	PTH4251	Research Proposal and Scientific Writing	4	CO1		CO2	CO3	CO4	CO1	CO2 CO3 CO4	
VIII	PTH4211	Physiotherapy Skills in Cardiopulmonary and Special conditions	2	CO1 CO2 CO3				CO1			
VIII	PTH4241	Disability and Health	3	CO1		CO2	CO3	CO2	CO3		
VIII	PTH4242	Cancer Rehabilitation	3	CO1 CO2 CO3 CO4			CO4		CO3		
IX		Internship (Duration: 26 Weeks) (Contact / Clinical hours:1,248)	NA	CO1	CO1 CO2 CO3	CO3 CO4			CO2 CO4		

8. PROGRAM REGULATIONS

1. Program Structure

1.1. The program is a choice based credit system.

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 (a maximum up to 15 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 would consist of 20 credits.

2.2 The credit distribution hours for Lecture, Tutorial, Practical, and Clinics are as follows:

Lecture (L) : 1 Hour /week = 1 credit = 13 hours
Tutorial (T) : 1 Hour /week = 1 credit
Practical (P) : 2 Hours/week = 1 credit
Clinics (CL) : 3 Hours/week = 1 credit
Note: For Basic sciences & Biostatistics course, 1 credit =15 hours (maximum)

2.3 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.

2.4 Internship is not credited.

2.5 Abbreviations / Symbols used in the credit distribution table:

L - Lectures, T - Tutorials, P -Practical, CL - Clinics, C - Total credits, IAC - Internal assessment component, ESE - End-Semester Exam, * Open Elective, # Program Elective

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

3.1. 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

3.2 The IAC component weightage for theory & practical is:
- 50% from Mid-semester examination
- 50% through Continuous assessment (as applicable to course)

3.3 For courses without continuous evaluation components, two sessional exams are conducted and the average of both sessional exams shall be considered as the final IAC.

4. Attendance

4.1 Minimum attendance requirements for each course is:

i. Theory : 75 %
ii. Clinics / Practical : 85 %

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

4.3 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.

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

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

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

5. Examination

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

5.2 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 3.2) given for respective courses.

5.3 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 (as indicated in clause 2.2).

5.4 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.

5.5 For those whose failed to clear any course during regular ESE, a **supplementary exam** is conducted 2 weeks immediately after the ESE result declaration to enable him / her to earn those lost credits. When a student appears for supplementary examination, the **maximum grade awarded is "C"** grade or below irrespective of their performance.

5.6 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).

5.7 For pre / para clinical course and program elective, irrespective of credit (2 or 3), the ESE is conducted out of 50.

5.8 For non-core courses such as Communication skills, Open electives, Indian constitution, Environmental sciences or courses as specified in curriculum, only internal assessment is conducted.

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 core courses (theory / practical), candidate should obtain a minimum of 50% (IAC + ESE or as applicable to course) to be declared as pass.

6.3. For non-core including psychology, pre and para clinical course, a candidate should secure a minimum of 40% in ESE to be declared as pass.

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.

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

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

8. Progression Criteria to higher semesters

8.1 The eligibility for promotion to the next academic year is subject to securing the minimum academic performance as specified below:

- First to second year: a minimum of 70% of the credits at the end of the first year (includes first and second semester)
- Second to third year: a cumulative minimum of 80% of the credits at the end of the second year (includes first, second, third and fourth semester)
- Third year to fourth year: a cumulative minimum of 90% of the credits at the end of the third year (includes first, second, third, fourth, fifth and sixth semester)
- Student will be **eligible for internship** only after successful completion of the entire course work

8.2 First year students who have failed to secure a minimum credit (as specified in 8.1), will be on **probation for next one year.** During that period, he / she will not be permitted to attend the second year / III semester classes and have to appear only for exam (during December / May) in order to acquire the missing credits. In the event of failure to acquire the required credits even by the end of second year (70%), he / she has to **exit the program**. Exit from the program is applicable only for first year students failing to acquire the required credits.

8.3 From second year onwards, in the event of failing to acquire required credits (80% or 90%), the students will be on probation. During that period, he / she will not be permitted to attend the classes and have to appear only for exam (during December / May) in order to acquire the missing credits. From second year onwards, failure to acquire the required credits by the end of subsequent year will not result in exit from program.

8.4 However, the student must complete all the course work requirements and credits by a **maximum of double the program duration**. For e.g. 4 years' program, all the academic course work needs to be completed within 8 years. Failure to do so will result in exit from the program.

9. Semester Break

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

10. Internship

10.1 Internship will not carry any credits and marks

10.2 Any components/ activities that need to be evaluated as part of internship will be assigned a grade without reflecting it in the CGPA.

10.3 An internship certificate with details of clinical/relevant areas of postings with hours will be issued to a candidate on completion of the Internship. The certificate must be authenticated by the HOD/Coordinator and HOI.

10.4 **Degree is awarded** only on successful completion of internship.

Head of the Department **Dean**

Deputy Registrar - Academics **Registrar**