SCHOOL OF NURSING SCIENCES AND ALLIED HEALTH

Vision Statement (School Level):

Mission Statements (3 to 4) (School Level):

DEPARTMENT OF PHYSIOTHERAPY

Vision Statement: To be recognized as one of the leading Physiotherapy institutes of higher learning by providing value-based education, facilitating research and health care services to rural and urban communities, keeping in view the global needs.

Mission Statements (3 to 4) (Department Level):

- MS1: Develop competency in the field of Physiotherapy by Imparting and disseminating evidence based knowledge.
- MS 2: Fostering research and development in the emerging areas of Physiotherapy while adhering to the ethical standards.
- MS 3: Generating awareness of physiotherapy through outreach programmes.
- MS 4: To gain recognition via collaboration in the global arena by providing quality healthcare thus improving quality of Life.
- MS 5: Generating opportunities for faculties and students thus keeping pace with the advances related to physiotherapy.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY (MUSCULOSKELETAL)**

QUALIFICATION DESCRIPTORS (QDs)

Upon the completion of Academic Programme Bachelor of Physiotherapy, students will be able to:

QD-1: Systematic, extensive and coherent knowledge and skill in Musculoskeletal Physiotherapy and its applications including critical understanding of established theories, principles and concepts, knowledge of advanced and emerging issues in Physiotherapy, skills in musculoskeletal Physiotherapy, recent advances and research in Physiotherapy evaluation and treatment procedures.

Geriatric pediatric women health lifestyle disorder non-communicable disease sports and fitness patient care ergonomic

QD-2: Demonstrate Comprehensive knowledge and skills in areas related to manual therapy, exercise therapy techniques and equipment, electrotherapeutic modalities and advanced learning material.

QD-3: Use knowledge and skills required for identifying problems and issues, in collection of relevant quantitative and/or qualitative data, its analysis and evaluation using appropriate methodologies for formulating evidence-based solutions and inferences.

QD-4: Address self-learning needs related to evidence based practice in current and emerging areas of Musculoskeletal physiotherapy and rehabilitation, use research and professional material, apply knowledge to new concepts and unfamiliar areas and seek well defined solutions in real life situations.

QD-5: Demonstrate empirical and research-based knowledge and transferable skills in the field of Musculoskeletal physiotherapy for patient care and presenting oneself as an employable candidate in various healthcare settings including wellness, sports and fitness centres creating employment opportunities for professional learning needs based on research and development work. community

Mapping Qualification Descriptors (QDs) with Mission Statements (MS)

	MS-1	MS-2	MS-3	MS-4
QD-1	3	2	2	1
QD-2	3	3	3	3
QD-3	3	3	2	3
QD-4	3	3	2	2
QD-5	3	2	3	3

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

PROGRAM LEARNING OUTCOMES (PLOs) (12)

After completing this course, the students should be able to:

PLO-1	Physiotherapy Knowledge	To demonstrate and apply physiotherapy knowledge and skills for the physiotherapeutic management of various medical and surgical conditions.
PLO-2	Communication Skills	To demonstrate and apply appropriate behavioral skills with humanitarian approach for communication with patients, relatives, co-professionals and community.
PLO-3	Problem analysis with the development of solution	To demonstrate and apply the physiotherapy evaluation skills by co relating with the clinical subjects for diagnosis of the patient problem and design an appropriate physiotherapeutic treatment strategy.
PLO-4	Evidence-based practice	To demonstrate and apply physiotherapy knowledge and skills on the basis of empirical evidence.
PLO-5	Development of research acumen	To demonstrate ability of critical thinking, define problems, formulate hypotheses and design, execute and report the results of experiments with conclusions.
PLO-6	Individual or team work	Demonstrate the ability to work in an efficient manner individually as well as in diverse groups for providing best treatment strategies for the patients and community.
PLO-7	Digital literacy	To demonstrate and apply knowledge of basic computer applications for clinical and research purpose including data management, data storage and generate data bases.
PLO-8	Cross cultural integration	To acquire knowledge of attitudes, beliefs and socio-cultural values relevant to a particular society and nation with global perspectives to engage with diverse groups effectively.
PLO-9	Ethics	To demonstrate moral/ethical values in conduct, awareness of ethical issues related to patient care, work practices, refraining from malpractice, unethical Behaviour, falsification, plagiarism, misinterpretation of data, non-adherence to intellectual property rights, adhering to truthful, unbiased actions in all aspects of work without discrimination based on age, race, gender, sexual preference, disease, mental status, lifestyle, opinions or personal values.
PLO-10	Physiotherapy patient evaluation and management	To select appropriate clinical examination and investigation for common clinical conditions and analyze critically the

		findings along with planning appropriate rehabilitation goals and designing evidence-based management protocols.
PLO-11	Leadership skills	Students must demonstrate ability for task allocation, organization of task elements, setting direction, formulating an inspiring vision, team building, to achieve a vision, engaging, knowledge and respect individual values and opinions in order to foster harmonious working relationships with colleagues, peers, and patients.
PLO-12	Life-long learning	Students must demonstrate ability to acquire knowledge and skills through ongoing learning, participation in continuous education programs, engaging in self-paced, self- directed learning aimed at personal development, meeting social and cultural objectives, skill development, adapting to changing environment and workplace requirements and challenges.

PROGRAM SPECIFIC OUTCOMES (PSOs)

After completing this Course, the students should be able to:

PSO-1: Demonstrate comprehensive knowledge and skills concerned with musculoskeletal physiotherapy enabling judicious treatment related decision making while evaluating the reliability and relevance of evidence.

PSO-2 : Express thoughts and ideas effectively in writing and orally, communicate with others using appropriate media, confidently share one's views in a clear and concise manner to different groups.

PSO-3: Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; the ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data; plan, execute and report the results of an experiment or investigation.

PSO-4: Demonstrate ability to work effectively with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause.

Mapping of Program Learning Outcomes (PLOs)

With Qualification Descriptors (QDs)

	QD-1	QD-2	QD-3	QD-4	QD-5
PLO-1	3	3	2	3	3
PLO-2	3	3	2	3	3
PLO-3	2	2	3	3	3
PLO-4	2	3	3	3	3
PLO-5	2	3	3	3	3
PLO-6	2	2	3	3	2
PLO-7	3	3	3	3	3
PLO-8	2	2	3	3	2
PLO-9	3	3	3	3	3
PLO-10	3	3	3	3	3
PLO-11	3	3	2	2	3
PLO-12	3	3	3	3	2

	QD-1	QD-2	QD-3	QD-4	QD-5
PSO-1	3	3	3	3	3
PSO-2	3	3	3	3	3
PSO-3	2	2	3	3	3
PSO-4	2	2	3	3	3

MASTER
OF
PHYSIOTHERAPY

Musculoskeletal

BYE-LAWS

ANNUAL SYSTEM

DEPARTMENT OF REHABILITATION SCIENCES
SCHOOL OF NURSING SCIENCES AND ALLIED HEALTH
JAMIA HAMDARD
(DEEMED TO BE UNIVERSITY)

BYE-LAWS

1. OBJECTIVES

To train Physiotherapists who will be able to:

- Assume leadership roles in field of Physiotherapy.
- Assume enhanced patient care responsibilities.
- Formulate and implement educational programs.
- Analyze and undertake research.

2. THE PROGRAMME

a. Name	Master of Physiotherapy (M.P.T.) Musculoskeletal
b. Nature	Regular and Full time.
c. Duration	Two Years

d.	**Pattern**	Annual system
e.	**Eligibility Criteria for Admission**	Educational: A candidate seeking Admission to the M.P.T. Programme must have a Bachelor's degree in Physiotherapy with a minimum of 50% marks in aggregate.

The Bachelor's degree course should be recognized by the regulatory body and from a University recognized by Jamia Hamdard.

f.	**Commencement**	July/ August of every year.
g.	**Mode of admission**	Written entrance test (as prescribed by the University). Reservation in seats will be as per University norms
h.	**Admission of Foreign Nationals/NRI /Company Sponsored Candidates**	Eligibility same as for general candidates Selection Procedure as prescribed by Jamia Hamdard from time to time.
i.	**Total Seats**	As notified in the Jamia Hamdard Prospectus.
j.	**Span Period**	4 Years
k.	**Teaching days:**	180 days
l.	**Medium of instructions and examination**	English

3. THE CURRICULUM

Master of Physiotherapy (M.P.T.)

Total theory papers:	09
Total Practical:	03
Dissertation Viva voce:	01
Seminars	02

Mode of Curriculum delivery and execution includes classroom teaching, assignments, tests, lab work, project, case studies, participation in relevant events, field visits and educational tour etc.

4. THE COURSE STRUCTURE: M.P.T.

Hours Distribution and marks distribution

First Year

Course Code	Subject	Hours	Marks	IA	EA	Credits
MTM 161	Basic Health Sciences	48	100	25	75	3
MTM 162	Medical & Surgical Management of Musculoskeletal Disorders	64	100	25	75	4
MTM 163	Advanced Diagnostics and Therapeutics	48	100	25	75	3
MTM 164	Research Methodology, Biostatistics and Computer Application	80	100	25	75	5
MTM 165	Seminars on clinical issues	48	100	100		3
MTM 166	Physiotherapy I- Basic Concepts, Assessment and Therapeutic Techniques in Musculoskeletal Physiotherapy (Theory)	96	100	25	75	6
MTM 167	Physiotherapy I- Basic Concepts, Assessment and Therapeutic techniques in Musculoskeletal Physiotherapy (Lab Hours)	48	100	25	75	3
MTM 168	Exercise Physiology	64	100	25	75	4
MTM 169	Clinical training	704				44
TOTAL		Total hours 1200	Total marks 800			75

Total hours:1200 (Theory hours:400, lab hours:48 hours, Seminars:48 hours, Clinical training:704 hours)

SECOND YEAR

Course code	Subject	Hours	Marks	IA	EA	Credits
MTM 261	Management, Education and ethics	80	100	25	75	5
MTM 262	Biomechanics and Kinesiology (Theory)	96	100	25	75	6
MTM 263	Biomechanics and Kinesiology (Lab hours)	32	100	25	75	2
MTM 264	Seminars on clinical issues	48	100	100		3
MTM 265	Dissertation	208	100		100	13

MTM 266	Physiotherapy II- Physiotherapy In Regional Musculoskeletal Disorders and Life Style Medicine (Theory)	96	100	25	75	6
MTM 267	Physiotherapy II- Physiotherapy In Regional Musculoskeletal Disorders and Life Style Medicine (Lab hours)	48	100	25	75	3
MTM 268	Clinical training	592				37
TOTAL		Total hours 1200	Total marks 700			**75**

Total hours: 1200 (Theory hours: 272, Lab hours: 80, Seminars: 48 hours, Dissertation: 208 hours, Clinical training: 592 hours)

5. ATTENDANCE

A. All students must attend every lecture / lab hour held in each subject. However, to account for late joining or other such contingencies the attendance requirement for appearing in the examinations shall be minimum of 75% of the classes actually held from the date of admissions. Each student is also required to participate in educational trips/ tour of the class.

B. In order to maintain the attendance record of a particular subject, a roll call will be taken by the teacher in every scheduled lecture and practical classes.

C. The teacher in -charge will consolidate the attendance record for theory & practical separately for each annual session. Attendance on account of participation in the prescribed functions of NCC, NSS, Inter-University Sports, Educational tours/ Fieldwork, shall be credited to the aggregate, provided the attendance record is duly signed by the Officer in-charge ,is sent to the Dean of the School within two weeks of the function / activity, etc.

D. The statement of attendance of students shall be displayed on the school notice board twice in each annual session. Copies of the same shall be kept in the Office of the Dean of the School/ of the concerned Department for record. Notice displayed on notice board shall be deemed to be a proper notification and no individual notice to students will be necessary.

E. If a student is found to be continuously absent from the classes without information for a period of thirty days, the teacher in-charge shall report it to the Head of Department. The Head will report it to Dean for necessary action.

F. A student with less than 75% attendance in theory and practical of each subject in a session shall be detained from appearing in the Annual Examination of the subject (s) in which the attendance is short. If the student has less than 85% attendance in the clinical practice, he/ she shall be detained from appearing in the practical examination. A 75% attendance is necessary in 'Seminars on Clinical Issues', failing which the marks in this subject will not be forwarded for final result, and the student shall have to reappear in the next academic session. However, the Dean of the School may consider for the condonation of attendance up to 5% on account of sickness or any other extenuating circumstances, provided the application condonation of attendance, duly certified by a Registered Practitioner/supported by documentary evidence has been submitted within seven days from recovery.

G. The students will get half summer and winter breaks only. Students will not get the autumn break. During the working half of summer and winter breaks, the students will continue with their clinical posting for the full day at their respective placements.

6. INTERNAL ASSESSMENT

A. There will be a total of 3 internal assessments in an academic session and best 2 out of 3

will be counted for final assessment. Tests will carry a weightage of 15marks in theory/practical, 5marks for attendance and 5 for assignment. The total weightage of the internal exams will be 25% of total marks in each subject in the Final/annual exams.

B. The Dates of the internal assessment exam will be notified in the academic calendar.

C. The Head of the Dept. shall consolidate the marks of internal assessment tests before forwarding it to the Asst. Registrar (Exam) at the conclusion of each academic session.

D. Sessional exams are to be conducted during the scheduled lecture time of the subject and other classes scheduled for that day are not to be cancelled.

E. A promoted candidate, who has to reappear in the Final/Annual examination of the paper, will retain internal assessment marks of the previous academic session

F. For 'Seminars on Clinical Issues' the marks will be based on presentations done by the students throughout the session. The assessment will be done by teachers of the specialty.

G. In the case of readmission the candidate shall go through the internal assessment process afresh and shall retain nothing of the previous academic session.

H. Missing an examination without prior permission of the competent authority will be counted as an attempt.

I. The marks of the internal assessment as well as the attendance will be notified and the examination answer sheets will be shown to the students and kept in record after receiving their signatures.

J. In exceptionally genuine and deserving cases, additional internal assessment tests may be held at the discretion of the competent authority.

7. ANNUAL EXAMINATIONS AND SUPPLEMENTARY EXAMINATIONS.

Final examination of theory and practical shall be conducted at the end of each session as outlined below.

a. Mode: Theory Papers	Written only
Lab Hours	Written, Demonstration and/ or Viva Voce
Viva Voce	Viva Voce
b. Duration: Theory	3 hours
Practical	Upto one hour per candidate
c. Examiner Theory	01 (from the panel)
Practical	02 (1 internal and 1 external) from the panel

*Panel to be prepared by the department and approved by the Competent Authority.

Viva Voce	02 (1 internal and 1 external) from the panel
d. Moderation of Theory Papers	For papers set by external examiners only. Change cannot be more than 30% by the teacher nominated by the Head.
e. Dissertation evaluation	There will be an internal and an external evaluator for each dissertation. The dissertation will be evaluated by the internal examiner and the viva voce will be conducted by the external examiner.

MINIMUM PASS MARKS

The minimum pass marks in each subject (theory and practical separately) shall be 50% of the maximum marks of the aggregate of Internal Assessment marks and Annual Examination marks. The student will need to obtain 50% of the maximum marks as aggregate of internal and external assessment, and need not obtain 50% of maximum marks in internal and external assessment separately.

8. PROMOTION SCHEME

In order to pass a paper a student has to secure at least 50% marks in paper. A student has to clear theory and practical separately.

(A) From 1st year to 2nd year

A candidate will be promoted from 1st year to 2nd year provided that he/she has passed in atleast 4 papers out of 9 prescribed in the first year in annual/supplementary examinations. If a candidate fails to satisfy the criteria mentioned above, he/she shall be detained in the 1styear.

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered

(B) Second/final year

After having passed all the subjects of first and second year, a candidate shall be eligible for award of degree of Master of Physiotherapy.

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered
Note :A candidate will be permitted to apply for re-evaluation if he /she wishes so.

There will be supplementary examinations within 45 days of declaration of the result of the annual examination.

9. CLINICAL PRACTICE

Students will engage in clinical practice in Physiotherapy Departments in the Orthopaedics/ Neurology/ Cardiopulmonary/ Sports Medicine setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

10. AWARD OF DEGREE

A. The candidate shall be awarded a Degree Certificate only on successful completion of the course including clinical practice for both the years.

B. The entire course of study in MPT for both the years must be completed within 4 years of the date of first admission.

11. MINIMUM PASS MARKS

The minimum pass marks in each subject (theory and practical separately) shall be 50%.

12. SPAN PERIOD

The entire course should be completed within a period of 4 years from the date of first admission to the program.

13. PAPER FORMAT

Max marks: 75
Duration: 3 hours

1) Essay type answer (total 30marks)
Attempt any 2 out of 3: each question carries 15 marks

2) Long answer questions (total 20 marks)
Attempt any 2 out of 3: each question carries 10 marks.

3) Short answer questions (25 marks)
Attempt any 5 out of 6: each question carries 5 marks

.

MASTER OF PHYSIOTHERAPY

1ST YEAR

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY FIRST YEAR**

Course Code: MTM 161 Title of the Course: BASIC HEALTH SCIENCES

L-T-P:144-0-0 Credits:3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

On completion of the study of this Course the student should be able to:

CO-1: Comprehend the knowledge of the structure & function of the human body in relevance to Physiotherapy. (Cognitive level: Understand)

CO-2: Correlate and apply the knowledge gained, in understanding and analysing the dysfunction of the human body. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	2	3	2	3	2	2	2	2	3	2	**3**	**3**	**2**	**3**
CLO2	3	2	3	2	3	2	2	2	2	3	2	**3**	**3**	**2**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

BASIC HEALTH SCIENCES

Paper code: 161 **(48 Hours)**

UNIT :1 (12 Hours)

Applied Anatomy and Histology

- Functional Anatomy of upper limb, lower limb, spine, head, neck and face.
- Surface Anatomy, Markings and Determinations.
- Pathoanatomy of peripheral nerve injuries, various bone pathologies, PIVD, Stenosis
- General Histology- Anatomy of cell membrane, types of epithelium and its anatomical location, histological appearance and fine details of bones, cartilage, muscle, ligament, tendon, peripheral nerves and spinal cord.

UNIT 2: (12 Hours)

Applied Physiology and Pathology

- Neuromuscular System – Electrical properties of nerve and Muscles, Mechanism of muscle contraction, Sources of energy for muscle contraction, neural control of movement, electrical and chemical transmission of impulses in nerve.
- Endocrine system – Role of hormones in sports, fitness and exercise and health.
- Respiratory System – Mechanics of respiration, pulmonary volumes and capacities composition of alveolar air, Transport of oxygen & Carbon dioxide into blood.
- Immune system – Immune response, immunology and exercise, autoimmune diseases, isoimmune diseases.
- Inflammation types, general features, vascular and cellular events
- Healing response; bone, muscle, tendon, ligament, cartilage etc.
- Metabolic disorders and nutritional disorders.

UNIT 3: (14 Hours)

Clinical Biochemistry and Pharmacology

- Review of Metabolism
  (i) Carbohydrates: Glycogenesis, Glycogenolysis, Glycolysis, CA, ETS,Lactate Metabolism
  (ii) Proteins: Nitrogen balance, Urea cycle
  (iii) Water: Fluid and Electrolyte balance, Water and Sodium balance

- Enzymes and markers in blood
  (i) Cardiovascular markers: Troponin, Creatine Kinase, Lactate Dehydrogenase, Myoglobin, Aspartate transaminase
  (ii) Neuromuscular markers: Acetylcholine, Dopamine, GABA
  (iii) Inflammatory Markers and free radicals: TNF alpha, Interleukins, NO, H_2O_2, Superoxide, HMGB1, VWF, Alarmins

- Biochemical and Genetic basis of diseases:
  (i) Neuromuscular disorders: Epilepsy, Parkinson Disease, Alzheimer, Schizophrenia, Polio, Cerebral palsy etc.
  (ii) Muscular disorders: Cystic Fibrosis, Congenital Muscular Dystrophy, Duchene Muscular Dystrophy, Baker's cyst.
  (iii) Biochemical, Physiological and Anatomical Change in Ageing, Osteoporosis, Obesity, Diabetes, Hypothyroidism

- Review of the following drugs, their effects and side effects
  (i) Skeletal Muscle Relaxant
  (ii) Opioid Analgesics and Antagonist
  (iii) Non-Steroidal Anti Inflammatory Drugs
  (iv) Drugs for Arthritis
  (v) Hormones and Vitamins
  (vi) Corticosteroids
  (vii) Antihypertensive Drugs
  (viii) Drugs for Diabetes

UNIT 4 (18 Hours)

- **Laboratory testing: Basics of laboratory findings (4 Hours)**

(i) Infection and inflammation, autoimmune disorders, Malignancy, Deficiency diseases, neuromuscular disease, Metabolic Disease like Diabetes, Hyperlipidaemia and Thyroidism.

- **Radio diagnosis: Basic of the following Imaging Techniques (14 Hours)**

(i) Fluoroscopic Examination, CT Scan, Radionuclide Scanning, MRI/Functional MRI.
(ii) Ultrasonography /Doppler, X rays, Bone Scan, DEXA Scan, PET and SPECT Scan, Angiography.
(iii) Regional imaging with X -Ray, MRI, CT Scan.
(iv) Ultrasonography of the following – Head and Neck, Chest, Shoulder, Elbow and Wrist, Spine, Pelvis, Hip and Thigh, Knee Complex, Lower leg, Foot and Ankle.

References:

1) Standring S, Ellis H, Healy J, Johnson D, Williams A, Collins P, Wigley C. Gray's anatomy: the anatomical basis of clinical practice. American journal of neuroradiology. 2005 Nov;26(10):2703.

2) Ciccone CD. Pharmacology in rehabilitation. FA Davis; 2015 Apr 10.

3) Snell RS. Clinical anatomy by regions. Lippincott Williams & Wilkins; 2011 Oct 28.

4) Corne J, Kumaran M. Chest X-ray made easy. Elsevier Health Sciences; 2015 Jun 26.

5) Hampton J, Hampton J. The ECG made easy e-book. Elsevier Health Sciences; 2019 Feb 12.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 162 Title of the Course: **MEDICAL & SURGICAL MANAGEMENT OF MUSCULOSKELETAL DISORDERS**

L-T-P: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

On completion of the study of this Course the student should be able to:

CO-1 The students should be able to demonstrate adequate knowledge about management of people with musculoskeletal disorders and orthopaedic diseases. (Cognitive level: Understand , Apply)

CO-2 The students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes. (Cognitive level: Understand ,Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	2	3	2	2	2	2	2	2	3	2	**3**	**3**	**2**	**3**
CLO2	3	2	3	3	2	2	2	2	2	3	2	**3**	**3**	**2**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

UNIT 1 (14 Hours)

- **Trauma: Assessment and management**
  - General assessment and management of soft tissue injuries
  - General assessment and management of post fracture stiffness.
  - General assessment and management of post immobilization complications of dislocations.

- **Assessment of pre and post-surgical management in Trauma of Upper Limb**
  a) General consideration of upper limb trauma
  b) Trauma of shoulder complex and associated bones

c) Trauma of elbow and associated bones
d) Trauma wrist and hand and associated bones

- **Assessment, pre and post-surgical management in Trauma of Lower Limb**
  a) General consideration of lower limb trauma
  b) Trauma of hip complex and associated bones
  c) Trauma of knee complex and associated bones
  d) Trauma of foot and ankle complex and associated bones

UNIT 2 (14 Hours)

Spinal cord injury-assessment and management.

- **Assessment pre and post-surgical management in trauma of spine**
  a) General consideration of spinal trauma
  b) Trauma of cervical spine and skull
  c) Trauma of thoracic spine
  d) Trauma lumbosacral spine

- **Assessment and management of post peripheral nerve injuries**
  a) Upper limb
  b) Lower limb
  c) Spine

- **Assessment and rehabilitation of the amputation.**
  a) Upper limb
  b) Lower limb

UNIT 3 (14 Hours.)

- Pre and post-operative assessment and management for:
  (i) Arthrodesis (ii)Osteotomy(iii)Arthroplasty(iv)Arthroscopy(v)Bone grafting(vi)Internal and external fixations(vii)Distractions and limb reconstruction(viii)Tendon Transfers(ix)Nerve suturing and grafting(x)Wound debridement(xi)Orthopaedic implants
- Pre and post-operative assessment and management in Developmental disorders.
- Pre and post-operative assessment and management in Congenital Disorders of the Bone and Joints.
- Pre and post-operative assessment and management in Infectious Disorders of the Bone and Joints.
- Basic medical concerns while treating a trauma/surgery patient along with- Diabetes, Hypertension, Women specific condition, Exercise induced Asthma, kidney impairment
- Bone and Joint Tumors,

UNIT 4 (14Hours)

Epidemiology, pathophysiology assessment and recent trends in management of the following:-

- Rheumatic and autoimmune disorders affecting the musculoskeletal system.
- Complex Regional pain syndrome.
- Degenerative joint diseases.
- Ankylosing spondylitis
- Osteoporosis
- Pre and Post-Partum musculoskeletal impairments

Reference Books:

1. . Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25.
2. Brotzman SB. Clinical orthopaedic rehabilitation. Mosby Incorporated; 1996.
3. Hertling D, Kessler RM. Management of common musculoskeletal disorders. Physical therapy principles and methods. 1996;3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 163

Title of the Course: **ADVANCED DIAGNOSTICS AND THERAPEUTICS**

L-T-P Credits: 48-0-0 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

On completion of the study of this course the student should be able to

CO-1 Understand theoretical concepts and physiological effects of electrotherapeutic modalities at cellular level.
CO-2 Identify recent advances in pain models.
CO-3 Apply recent knowledge and skill related to exercise therapy interventions and electrotherapeutic modalities in different physiotherapy conditions for patient recovery.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	1	3	2	2	1	1	1	1	3	1	**2**	**3**	**1**	**3**
CLO2	3	1	3	2	3	1	1	1	1	3	1	**2**	**3**	**1**	**3**
CLO3	3	3	3	3	3	3	3	3	3	3	3	**3**	**3**	**3**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

UNIT 1 (14 Hours)

1. **Human performance analysis**
   a) Body composition, strength, agility, endurance and performance testing
   b) Basic principles, procedure and clinical implications of Body Composition analysis
   c) Muscle strength -Physiological, biochemical and biomechanical Parameters for assessment of Muscle strength
   d) Dynamometry-Hand held dynamometer, back and leg dynamometer, Hand grip measurement, 1 RM measurement
   e) Instrumentation, Procedure of data measurement and Role of Isokinetic dynamometer in Rehabilitation
   f) Endurance testing; muscle and cardiovascular endurance testing
   g) Assessment of muscle damage and fatigue
   h) Assessment of Joint proprioception, Balance, Coordination and Agility

2. **Applied movement analysis**
   a) Introduction to two and three dimensional movement analysis
   b) Instrumentation and Methods of movement analysis (Gait Analyses).
   c) Electro goniometry and accelerometer, Inclinometer, Pressure transducers and Force plate

3. **Electromyography (EMG) and Nerve Conduction Velocity (NCV) in Rehabilitation**
   a) Electrophysiology of nerve and muscles

b) EMG – Basic principles, Processing, Recording, Normal and Abnormal Potentials, Single FibersAnd Macro EMG, Reporting, Results, Clinical implications of EMG test, Kinesiological EMG.
c) NCV (MNCV and SNCV) Basic concepts and methods of recording and interpretation, Clinical implication in various musculoskeletal and neuromuscular conditions.
d) Basics of ECG waves-Normal and Abnormal interpretation

UNIT 2 (14 Hours)

1) Evidence based Role of Exercise therapy intervention and practice in: Pain management, Endurance impairment, impaired mobility, impaired neuromuscular control, impaired joint sense, Impaired Gait and posture

2) Specific Exercise Interventions: Isokinetic, Plyometric, Pilates, Open and closed kinetic chain, PNF, Core Stabilization, Aquatic therapy , Home Programme and its adherence.

3) Specific consideration in exercise therapy: Female, Paediatric, Amputation, geriatric patients

4) Evidenced based role of Electrotherapy intervention and Practice in- Spasm management. Healing and Wound management, Oedema management, Muscular impairment

5) Evidenced based role of Microwave diathermy, Shortwave diathermy, Ultra violet radiation therapy and Ultrasound Therapy in physiotherapy.

6) Special consideration for electrotherapeutic modalities: Pregnant women, Menstruating women, Paediatric, Geriatric, Neurologically impaired, mentally impaired people.

UNIT 3 (14 Hours)

1. Introduction, basic principles, techniques of application, indications, contraindications and evidenced based role of the following in Rehabilitation:
    a) Neuromuscular Electrical Stimulation (NMES)
    b) Russian And Interferential and HVPG Currents
    c) Functional Electrical Stimulation (FES)
    d) Extra Corporeal Shock Wave Therapy (ESWT)
    e) EMG Biofeedback
    f) Microcurrents.
    g) LASER
    h) Virtual Reality

UNIT 4 (14 Hours)

1. Basic molecular biology of pain
2. Electrophysiology of peripheral and central aspect of pain
3. Pain measurement tools and physiotherapy management strategy

4. Role of different electrotherapeutic modalities in management of pain and healing

Reference Books:

1) Sheila K, Sarah B. Electrotherapy: Evidence-Based Practice. Churchill Livingstone,. 2002.

2) Low JL, Reed A. Electrotherapy explained: principles and practice. Elsevier Health Sciences; 2000.

3) Penrose HW. Electrical Motor Diagnostics. Success by Design; 2015.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 164 Title of the Course: **RESEARCH METHODOLOGY, BIOSTATISTICS AND COMPUTER APPLICATION**

L-T-P Credits : 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

On completion of the study of this Course the student should be able to:

CO-1: Understand the methods of research process and research design so as to effectively plan research.

CO-2: Acquire skills to critically review literature, formulate problems, writing and publishing conducted research.

Biostatistics

CO-3: Apply basic biostatistics in research

CO-4: Understand and interpret the statistical measures used in analysis of research data.

Understand and get familiarized with different software's and resources used in statistical analyses of research data. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	3	3	2	3	3	3	2	2	2	2	**3**	**3**	**3**	**3**
CLO2	3	3	3	3	3	3	3	2	2	2	2	**3**	**2**	**3**	**3**
CLO3	2	3	2	2	3	2	3	1	1	1	1	**3**	**1**	**2**	**1**
CLO4	1	1	3	3	3	2	3	1	1	1	1	**3**	**1**	**3**	**3**

'3' is for 'High-level' mapping, 2 for 'Medium-level'mapping, 1 for 'Low-level'mapping.

Detailed Syllabus:

To enhance the ability of the Physiotherapist to conduct scientific studies thereby addressing the concerns of a commitment to inquiry, knowledge development &responsible (knowledge based) clinical practice & to construct valid & reliable assessment tools capable of yielding data of scientific value.

UNIT 1 – Concepts of Research Methodology (24 Hours)

a) An Introduction to Research Methodology (2 Hours)
b) Defining the Research Problem (2 Hours)
c) Review of Literature/Use ofIT &Database for ROL (2 Hours)
d) Research Design – Experimental &Non-Experimental (4 Hours)
e) Measurement and Scaling Techniques (2 Hours)
f) Reliability and Validity (2 Hours)
g) Variables and Operational Definition (2 Hours)
h) Methods of Data Collection (2 Hours)
i) Sampling and Sample Size Calculation (1 Hour)
j) Level of Evidence (1 Hour)
k) Research Ethics, Informed Consent and Plagiarism (2 Hours)
l) Writing Research Proposal (1 Hours)
m) Use of Animals and Human Subjects in Research (1 Hour)

UNIT 2 – Applications of Research Methodology (17 Hours)

a) Choosing &Developing Research Question
b) Critiquing A Published Article
c) Presenting Research Proposal
d) Applying for Research Funding
e) Writing in Scientific Style – Research Paper, Book Review, Thesis, Project Report
f) Referencing, Citation, Indexing and Impact Factor
g) Presenting Research
h) Preparing a Conference Poster
i) Research in Rehabilitation

UNIT 3: Concepts in Biostatistics (25 Hours)

1) Introduction to Biostatistics (4 Hours)

(i) Definition, concept, function and limitation
(ii) Measures of central tendency (Mean, mode and median) and dispersion (absolute and relative measure)
(iii) Rate,ratio, proportion, incidence and prevalence, Point prevalence

2) Sampling & Assignment (5 Hours)

(i) Methods of sampling – Probability and Non-probability Sampling
(ii) Methods of Assignment

3) Basic probability distribution and sampling distributions(6Hours)

(i) Concept of probability and probability distribution.
(ii) Normal, Binomial distribution, Standard error and confidence intervals, Skewness and kurtosis

4) Tests of Significance: (10Hours)

(i) Basic of Testing of Hypothesis –
- Null and Alternate Hypothesis
- Type I and Type II Errors

(ii) Level of Significance, p-value
(iii) Parametric Test, Non-Parametric Test, Correlation and Regression
(iv) Concept oft-Test, F Test and Chi Square

UNIT 4: Computer Application in Research &Biostatistics (14 Hours)

- Overview of available software used in analysis and research-SPSS, STATA etc.
- Procedure of preparation of Master chart in Excel sheet
- Procedure of representation of data, Result and descriptive statistics with table, Graph, Pie chart, scatter diagram, pictograph etc.

Recommended books

1) Christopher Bork: 1992: Research in physical therapy

2) Domholdt E. Physical therapy research. Principles and applications. 1993.

3) Hicks CM. Research methods for clinical therapists: applied project design and analysis. Elsevier Health Sciences; 2009 Aug 7.

4) Swisher LL, Page CG. Professionalism in physical therapy: History, practice, and development. Elsevier Health Sciences; 2005 Feb 15.

5) Mahajan BK. Methods in Biostatistics For Medical Students & Research Workers, Jaypee Brothers Medical publishers (P) Ltd. New Delhi, India. 1991.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 165 Title of the Course: **Seminar on Clinical Issues**

L-T-P Credits: 0-0-48 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

On completion of the study of this course the student should be able to

CO-1: Demonstrate adequate knowledge and skill in seminar presentation.

CO-2: To develop an evidence based presentation on the allocated topic.

CO-3: Debate contentious issues in the efficacy of physiotherapeutic management.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	3	3	3	3	3	3	1	1	3	3	**3**	**3**	**3**	**3**
CLO2	1	3	3	3	3	1	3	1	1	1	3	**3**	**1**	**3**	**3**
CLO3	1	3	3	3	3	3	3	3	1	1	3	**3**	**1**	**3**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

These will serve as a platform for students to integrate various components of patient management, and debate contentious issues in the efficacy of physiotherapy techniques. Students will give presentations on topics provided to them. The whole list of topics along with the name of moderator and the date of presentation will be provided to the students at the beginning of the academic session.

Teaching-Learning Strategies in brief :

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief :

Assessment is in form of internal assessment which is of 100 marks. The student will present seminars on topics allocated to them and will be marked on the basis of their presentation skills, information presented, ability to defend their argument and answering the questions put up.

Course Code: MTM166 Title of the Course: **BASIC CONCEPTS, ASSESSMENT AND THERAPEUTIC TECHNIQUES IN MUSCULOSKELETAL PHYSIOTHERAPY (THEORY)**

L-T-P Credits: 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

On completion of the study of this course the student should be able to

CO-1: Describe the Anatomy and Physiology of the joints and musculoskeletal system.
CO-2: The student should be able to rationalise various assessment techniques and provide a more functional and comprehensive approach to manage musculoskeletal disorders.
CO-3: The student should be able to compare & contrast the outcome of various manual and mechanical therapy approaches.
CO-4: To practice different joint mobilization and soft tissue mobilization techniques.
CO-5: Formulate a differential diagnosis and deliver appropriate physiotherapy management protocol.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	1	1	1	1	1	1	1	1	2	1	**3**	**1**	**1**	**1**
CLO2	3	1	1	1	1	1	1	1	1	2	1	**3**	**1**	**1**	**1**
CLO3	3	1	2	3	3	1	2	1	1	3	1	**3**	**3**	**1**	**2**
CLO4	3	2	3	3	3	1	3	1	1	3	1	**3**	**3**	**1**	**3**
CLO5	3	3	3	3	3	3	3	3	3	3	3	**3**	**3**	**3**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

UNIT 1 (20 Hours.)

1. Properties of Dense connective tissues, soft tissue injury and repair, bone injury and repair
2. Arthrology
3. Introduction to evidence based practice in musculoskeletal rehabilitation

4. Importance of assessment and evaluation in musculoskeletal physiotherapy
    a) Methods of evaluation
    b) Clinical evaluation
5. Subjective assessment-demography, history taking etc.
6. Objective assessment-observation, inspection, motor assessment sensory testing, selective tissue tension test functional evaluation Balance, coordination, posture and gait assessment
7. Evaluation of physical fitness
8. Ergonomic evaluations
9. Guidelines for Physiotherapy documentation
10. Clinical decision making
11. Disability evaluation

UNIT 2 (20 Hours)

- Functional assessment
- Conceptual framework
- Functional scales condition wise, interpretation, scoring
- Multidimensional functional assessment instruments, reliability, specificity, validity, acceptability, specificity and practicality
- Outcome measure of evaluation –

A. Shoulder – ASES, DASH, Quick DASH, NEER shoulder Score, Oxford instability Score, Oxford Shoulder Score, Rockwood score for SC joint, UCLA,WOOS,UEFI, rotator cuff QOL, Shoulder function Assessment, SPADI

B. Elbow - ASES,PREE,PRTEE,Upper extremity function scale

C. Wrist/Hand – ABILHAND manual ability measure, Sequential occupational dexterity, patient rated wrist evaluation

D. Spine – Oswestry low back pain disability index, Ronald morris questionnaire, back pain functional scale

E. Pelvis – Lova pelvic score, Orlando pelvis outcome scale

F. Hip – IOWA hip score, mc master Toronto arthritis questionnaire, on arthritic hip score, oxford hip score, patient specific hip rating scale, rheumatoid arthritis outcome score, womac osteoarthritis index, total hip arthoplasty outcome evaluation

G. Knee – American academy of orthopedic surgeon hip and knee score, ACL evaluation format, ACL-QoL ,Lyshlom knee function scoring scale ,OA knee hip QoL,Fulkerson-shea patellofemoral joint evaluation score,Lowa knee evaluation, patellofemoral severity scale, Cincinatii knee rating system,knee outcome survey activities of daily living scale.

H. Ankle – Achilles tendon total rupture score, American academy of orthopedic surgeon foot and Ankle scale, foot and ankle disability index, Lowa ankle score

I. Quality of life – European quality of life, Nottingham health profile, SF-36,SF12,sickness impact profile.

J. Scales for specific condition – Rheumatoid arthritis, Osteoarthritis, ankylosing spondylitis, fibromyalgia.

UNIT 3 (36 Hours)

1. Foundational concepts in manual therapy:
   Biomechanical principles in manual therapy
   Clinical reasoning

2. Joint mobilization techniques:
    a) Maitland's technique

b) Mulligan's technique
c) McKenzie's technique
d) Kaltenborn technique

3. Related anatomy and physiology, terminology, principles, indications, contra indications, assessment and treatment procedure of the following techniques at spinal and peripheral regions.
    a) Myofascial release techniques
    b) Trigger point release
    c) Lymphatic manipulations
    d) Cyriax concept
    e) Sports massage
    f) Positional release techniques
    g) Muscle energy techniques
    h) Neural tissue mobilization

UNIT 4 (20 Hours)

1. Role of PNF in musculoskeletal rehabilitation
    - Basic Principles
    - Techniques
    - Pattern of facilitation
    - Indications and precautions
    - Therapeutic effects
    - Evidenced based application

2. Core Stabilization- basic principles, exercise selection, exercise programme, program variation, scientific rationale

3. Advance fitness program-Guidelines, precaution, design and training parameters, clinical consideration of-Plyometric

4. Pilates and other special training program used in musculoskeletal rehabilitation

5. Basic principle, techniques, indication, precaution and contraindication of joint proprioception, balance and Coordination training in musculoskeletal health

6. Recent advances in PT management of musculoskeletal disorders
7. Basic principles yoga, role of yoga in Musculoskeletal health, evidence-based comparison of yoga and physiotherapy in musculoskeletal health.

8. Telerehabilitation – Definition, Modes of Delivery, Evidence based Practice, Status and Practice in India

Reference Books:

1. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25.

2. Brotzman SB. Clinical orthopaedic rehabilitation. Mosby Incorporated; 1996.
3. Hertling D, Kessler RM. Management of common musculoskeletal disorders. Physical therapy principles and methods. 1996;3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 167 Title of the Course: **BASIC CONCEPTS, ASSESSMENT AND THERAPEUTIC TECHNIQUES IN MUSCULOSKELETAL PHYSIOTHERAPY**

(LAB HOURS)

L-T-P : 0-0-48 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

On completion of the study of this Course the student should be able to

CO-1: Interpret and differentiate between various diagnostic tools used for therapeutic plan, take history of the conditions of patients.

CO-2: Able to analyze the multifaceted aspects of the clinical problem and appreciate a multifaceted approach to evaluation and treatment leading to sound clinical reasoning.

CO-3: Able to Identify treatment approaches and their appropriate match with clinical problems.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	3	3	3	3	3	2	2	2	3	2	**3**	**3**	**3**	**3**
CLO2	3	3	3	3	3	3	3	2	3	3	2	**3**	**3**	**3**	**3**
CLO3	3	3	3	2	2	3	2	3	3	3	3	**3**	**3**	**3**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Students will be instructed via demonstration, hands on techniques, field visits and case presentation on assessment tools, specific techniques used in the management of patients with musculoskeletal disorders. Students will draw on their experiences at the experiences at the clinical postings to formulate a treatment plan for case presented at the case conference.

Reference Books:

1. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25.
2. Brotzman SB. Clinical orthopaedic rehabilitation. Mosby Incorporated; 1996.
3. Hertling D, Kessler RM. Management of common musculoskeletal disorders. Physical therapy principles and methods. 1996;3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 168 Title of the Course: **EXERCISE PHYSIOLOGY**

L-T-P: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

At the end of the course, the learner should be able to:

CO-1: Describe various physiological/systemic changes that occur during exercise.

CO-2: Describe various types, principles and application of different types of exercise training methods.

CO-3: Apply the principles of diet and nutrition in exercise prescription.

CO-4: Assess and prescribe exercise protocol in special populations like Geriatrics, athletes', obese, pregnancy and in various systemic conditions like hypertension and respiratory conditions.

CO-5: Describe the process of body's acclimatization to various environmental conditions.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	2	2	2	2	2	2	1	1	3	1	**3**	**3**	**2**	**3**
CLO2	3	2	2	2	2	2	2	1	1	3	1	**3**	**3**	**2**	**3**
CLO3	3	2	2	2	2	2	2	1	1	3	1	**3**	**3**	**2**	**3**
CLO4	3	2	2	2	2	2	2	1	1	3	1	**3**	**3**	**2**	**3**
CLO5	3	2	2	2	2	2	2	1	1	3	1	**3**	**3**	**2**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

SECTION I: ENERGY TRANSFER

A. Review of Bioenergetics, Energy Release from food and Energy transfer in body (2 hours)

B. Energy transfer during exercise (4 hours)
   a. Adenosine Triphosphate-Phosphocreatine system
   b. Lactic acid system
   c. Aerobic system
   d. Maximal Oxygen uptake
   e. Oxygen debt

C. Energy generation capacity during exercise:

1. Measurement and evaluation of anaerobic energy systems (3 hours)
   a. The immediate energy system
   b. Performance tests of anaerobic power and capacity
   c. The short term energy systems

2. Measurement and evaluation of aerobic energy systems (4 hours)
   a. Direct calorimetry
   b. Indirect calorimetry
      - Closed circuit spirometry
      - Open circuit spirometry
   c. Respiratory Quotient
   d. Respiratory exchange ratio
   e. The maximal oxygen uptake (VO_{2max})

D. Expenditure of energy during rest and physical activity

1. Energy expenditure at rest (2 hours)
    a. Basal metabolic rate
    b. Body size and resting metabolism
    c. Resting daily energy expenditure

2. Energy expenditure during physical activity (2 hours)
    a. Classification of work by energy expenditure
    b. Metabolic equivalent (MET)

SECTION II: PHYSIOLOGIC SUPPORT SYSTEMS

A. Exercise and Respiratory System (2 hours)
    i. Review of gas exchange and transport of oxygen and carbon dioxide transport
    ii. Regulation of pulmonary ventilation during rest and exercise

B. Exercise and Cardiovascular system

1. Blood Pressure (2 hours)
    a. At rest
    b. During exercise
    c. In recovery
2. Regulation of heart rate and blood pressure (1 hour)
3. Exercise and blood flow regulation (1 hour)
4. Functional Capacity of the Cardiovascular System (1 hour)
5. Exercise Testing (2 hours)

C. Exercise and Neuromuscular System (4 hours)
    i. Muscle fibre types: structure and function.
    ii. Motor unit – Functional Characteristics
    iii. Chemical and mechanical events during muscle contraction and relaxation
    iv. Proprioceptors in muscles, joints and tendons
    v. Action potential and neural transmission

D. Endocrine System and Exercise (2 hours)

SECTION III: EXERCISE TRAINING AND ADAPTATIONS

A. Training the aerobic and anaerobic systems

a. Principles of exercise training (1 hour)
    i. Overload principle
    ii. Specificity principle
    iii. Individual differences principle
    iv. Reversibility principle

b. Adaptations to exercise training (2 hours)
    i. Anaerobic system changes
    ii. Aerobic system changes

c. Factors affecting aerobic training response (1 hour)

d. Establishment of training intensity (2 hours)
   i. Training at percentage of VO_{2max}
   ii. Training at percentage of maximum heart rate
   iii. Training at a perception of effort
   iv. Training at Lactate threshold
   v. Estimation of Exercise HR
e. Methods of training: (3 hours)
   i. Anaerobic training
   ii. Aerobic training: Continuous versus intermittent methods
   iii. Formulating the exercise: Relief interval
   iv. Overtraining & Fatigue

B. Strength training
a. Measurement of muscular strength (2 hours)
   i. Cable tensiometry
   ii. Dynamometry
   iii. One-repetition maximum
   iv. Computer-assisted electromechanical and isokinetic determinations
b. Strength testing considerations (1 hour)
c. Training of muscles for improvement of strength (3 hours)
   i. Overload and intensity
   ii. Force-velocity relationship
   iii. Power-velocity relationship
   iv. Load-repetition relationship
d. Male and female differences in muscular strength (1 hour)
e. Systems of resistance training (4 hours)
   i. Isometric training
   ii. Dynamic constant external resistance training
   iii. Variable resistance training
   iv. Isokinetic training
   v. Plyometric training
f. Periodization (2 hours)
g. Adaptations to resistance training (1 hour)
h. Recommendations for resistance training program initiation (1 hour)
i. Resistance training guidelines for sedentary adults, the elderly and cardiac patients (2 hours)

SECTION IV: EXERCISE PERFORMANCE AND ENVIRONMENTAL STRESS

A. Environmental factors affecting exercise performance (3 hours)
   a. Mechanism of thermoregulation
   b. Exercise in heat
   c. Exercise in cold

E. Exercise at altitude (3 hours)
   a. Altitude related medical problems
   b. Acclimatization
   c. Exercise capacity at altitude

Suggested readings:

1. Essentials of Exercise Physiology. W. D. McArdle, F. I Katch, V. I. Katch. 3rd ed. Lippincott Williams and Wilkins.
2. Exercise Physiology: a Thematic Approach. Tudor Hale. 2003. John Wiley and sons.
3. Exercise Physiology. Clarke. Prentice Hall.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 169 Title of the Course: **CLINICAL TRAINING**

L-T-P :0-0-704 Credits:44

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

The main outcomes will be:

CO-1: Understanding of community and health care workers
CO-2: Understanding the assessment of a patient and its management
CO-3: Understanding of different departments in a hospital.
CO-4: Understanding basic knowledge of modality and its implementation
CO-5: Understanding basic knowledge of musculoskeletal rehabilitation, disability evaluation and its implementation.
CO-6: Understanding the recent advance techniques in musculoskeletal rehabilitation and its application.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	1	3	2	1	1	3	1	3	3	1	3	**1**	**1**	**3**	**3**
CLO2	3	3	3	3	3	3	3	3	3	3	3	**2**	**3**	**3**	**3**
CLO3	2	2	1	1	1	3	1	1	1	1	1	**1**	**1**	**2**	**1**
CLO4	2	2	1	1	1	3	1	1	1	1	1	**1**	**1**	**2**	**1**
CLO5	3	3	3	3	3	3	2	2	2	3	2	**3**	**3**	**3**	**3**
CLO6	3	2	3	3	3	2	2	1	2	3	2	**3**	**3**	**2**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Students will be engaged in clinical practice in Physiotherapy Departments and Orthopaedic in Patient department in the Orthopaedic setting to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.

Teaching-Learning Strategies in brief (4 to 5 sentences)

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

MPT (Musculoskeletal)

SECOND YEAR

Course Code: MTM 261 Title of the Course: **ETHICS MANAGEMENT AND EDUCATION**

L-T-P : 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

PHYSIOTHERAPY ETHICS

CO-1: The student should be able to demonstrate adequate knowledge and skill in ethical principles of physiotherapy.

CO-2: Be aware of legal rights and duties as per the laws of Physiotherapy Governing bodies.

MANAGEMENT

CO-3: Apply managerial skills in planning, implementation and administration of clinical activities.

CO-4: To document comprehensive and accurate health records.

PEDAGOGY IN PHYSIOTHERAPY EDUCATION

CO-5: To be able to understand and apply different teaching – learning methods for imparting physiotherapy education.

CO-6: Describe the concept of learning evaluation and curriculum development.
CO-7: Execute clinical teaching and awareness.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	1	2	2	1	1	1	1	1	3	1	2	**2**	**1**	**2**	**2**
CLO2	1	2	2	1	1	1	1	1	3	1	2	**2**	**1**	**2**	**2**
CLO3	1	2	3	2	1	3	3	3	1	1	3	**2**	**1**	**3**	**1**
CLO4	1	1	1	1	1	1	3	1	1	1	1	**1**	**1**	**3**	**1**
CLO5	3	3	3	3	2	3	2	2	2	2	3	**2**	**3**	**3**	**3**
CLO6	1	2	2	1	1	2	2	1	1	1	2	**1**	**1**	**1**	**1**
CLO7	1	2	2	1	1	2	2	1	1	1	2	**1**	**1**	**1**	**1**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

MANAGEMENT (40 Hours)

To enhance the ability of the Physiotherapist to implement the principles of management & administration in the context of increasing interaction between the Health – care facility & the community.

1. Health care delivery system (including in health prevention and promotion) Hospital: types and functions; clinical, supportive &ancillary services of a hospital
2. Facility planning designing values based facility, strategic planning, design decisions planning steps & process planning for growth(Acute care, rehabilitation center, school system, adult day care, long – term care, home care and private practice, community care, industrial set-up, Hospice)
3. Organizing & engaging people in work setting
   concept of productivity
   organizational leadership: roles, responsibilities & competencies.
   management styles
   work teams
   organizational performance improvement (quality& service improvement)
4. Dealing with differences (values, diversity concerns)
   Conflicting values& motivations
   Organizational, personal & professional guidance (organizational self-view, fundamental documents
5. Organizational structure & control for business success
   characteristics of business structures

(legal structure, tax status, operating structure)
Organizational structure
(organizational chart, hierarchy in organizations, organizational patterns)
product strategy decisions
policies & procedures
re-organization
human resource management in relation to the operating structure.

6. Recruitment (personnel & entry level students)
7. Directing and controlling
8. Monitoring and evaluation
9. Information management
   management & flow of information in an organization use of data documentation
   (personnel, technological, financial considerations & realistic expectations)
10. Outcome management
11. Quality management- basis of quality management, quality assessment/control (audit), quality assurance, international quality system
12. Risk management
13. Financial management (fiscal management & cost accounting)
14. Marketing
    market orientation, segmentation, consumer behaviour, consumer research
    basics of marketing
    marketing plan
    marketing strategies in health care/ rehabilitation services.
    promotional considerations (communication methods &media, the marketing campaign)
15. Consultancy
16. Entrepreneurship: ownership & private practice

SECTION –II
PEDAGOGY in PHYSICAL THERAPY EDUCATION (30 Hours)

To enhance the potential of the Physical Therapist to become effective communicators especially in the context of education

1. Introduction to Education and emerging issues in education (5 Hours)
   a) Meaning, functions and aims of education
   b) Agencies of education
   c) Formal, informal & non-formal education
   d) Current issues & trends in higher education
      - Issue of quality in higher education
      - Autonomy & accountability
      - Privatization of education
      - Professional development of teachers
      - Education of persons with disabilities
   e) Philosophy of Education
      - Need for educational philosophy
      - Some major philosophies (Idealism, Naturalism, Pragmatism) & their implications for education.

2. Concepts of teaching & learning (3 Hours)

a) Meaning need & scope of educational psychology
b) Meaning & relationship between teaching & learning
c) Learning theories
d) Dynamics of behaviour
e) Individual differences

3. Curriculum (4 Hours)
a) Meaning & Concept of Curriculum
b) Basis for curriculum formulation/development.
c) Framing objectives for a curriculum
d) Process of curriculum development (including field work)
e) Factors affecting curriculum development
f) Evaluation of curriculum

4. Planning for teaching (3 Hours)
a) Bloom's taxonomy of instructional objectives
b) Writing instructional objectives in behavioural terms
c) Unit Planning & Lesson Planning
d) Preparation of unit plan & lesson plan
e) Concept of Microteaching

5. Teaching Methods (6 Hours)
a) Lecture, lecture – demonstration, discussion, seminar, assignment, project method and case study method

6. Teaching aids (2 Hours)
a) Types of teaching aids
b) Principles of selection
c) Preparation and use of audio – visual aids

7. Measurement &Evaluation (4 Hours)
a) Nature of educational measurement: meaning, process & types of testing
b) Construction of an achievement tests & its analysis.
c) Standardized tests
d) Introduction of some standardized tools and important tests of intelligence, aptitude and personality
e) Continuous & comprehensive evaluation.

8. Guidance &counselling (1 Hour)
a) Meaning & concepts of guidance &counselling
b) Principles of guidance &counselling services for students & faculty members
c) Faculty development & development of personnel for physiotherapy services

9. Clinical Education (2 Hours)
a) Awareness & guidance to the common people about health & disease and available Professional services.
b) Patient education
c) Education of health care practitioners
d) Use of media in clinical education

SECTION – III (10 hours)
Legal Professional and Ethical Issues

a. Physiotherapy: Definition and Development.
b. The Implications & Conformation to The Rules of Professional Conduct.
c. Legal Responsibility for Their Actions in The Professional Context and Understanding the Physiotherapist's Liability and Obligations in The Case of Medical Legal Action.
d. Code of Ethics
e. A Wider Knowledge of Ethics Relating to Current Social and Medical Policy in The Provisions of Health Care.
f. Functions of The Relevant Professional Associations Education Body and Trade Union.
g. The Role of The International Health Agencies Such as The World Health Organizations.
h. Standards of Practice for Physiotherapists
i. Current Issues.

SUGGESTED READINGS

1) Chandra SS, Sharma RK. Principles of education. Atlantic Publishers & Dist; 2004.

2) Srinibas Bhattacharya(2002) Philosophical Foundation of Education

3) Bhattacharya S. Sociological Foundation of Education. Atlantic Publishers & Dist; 2006.

4) kotler P. From mass marketing to mass customization. Planning review. 1989.

5) Chandra SS, Sharma RK. Principles of education. Atlantic Publishers & Dist; 2004.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 262 Title of the Course: **BIOMECHANICS AND KINESIOLOGY(THEORY)**

L-T-P : 96-0-0 Credits:6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

On completion of the study of this course the student should be able to

CO-1: Identify and apply the principles of biomechanics and kinesiology in understanding the normal functioning of the human body.
CO-2: To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions.
CO-3: To understand and apply the applications of movement dysfunction into therapeutic exercise prescription.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	2	3	3	3	2	2	2	2	3	1	**3**	**3**	**2**	**3**
CLO2	3	2	3	3	3	3	2	3	3	3	2	**3**	**3**	**2**	**3**
CLO3	3	2	3	3	3	3	2	3	3	3	3	**3**	**3**	**3**	**3**

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Injury occurs from mechanical overload of tissue. This simple tenet is often overlooked by those responsible for injury prevention and rehabilitation of those already injured. This subject fills the current need for a resource that synthesizes the links between tissue properties, skeletal architecture, applied loads and injury. This subject will provide the mechanical bases of musculoskeletal injury to better understand causal mechanisms, the effect of injury on musculoskeletal tissues, and how our current knowledge of biomechanics can contribute to injury prevention. The subject will include comprehensive information on:-

- The basic biomechanical concepts of force, stress and strain, stiffness, and elasticity;
- The mechanics of joints that are subject to disabling injury;
- The structure of connective tissues (bone, cartilage, tendons, and ligaments), which are most often involved in musculoskeletal injuries; and
- Factors such as age, gender, nutrition, and exercise, which affect the musculoskeletal system's response to force.

1) Biomechanical Concepts - 6 Hours

(i) Mechanical principles of Materials
(ii) Kinematics
(iii) Kinetics
(iv) Fluid Mechanics
(v) Material Mechanics
(vi) Introduction to Biomechanical Modelling and Simulation

2) Tissue Biomechanics and Adaptation - 12 Hours

(i) Bone Biomechanics (2 hours)
(ii) Articular Cartilage Biomechanics (2 hours)
(iii) Tendon and Ligament Biomechanics (4 hours)
(iv) Skeletal Muscle Biomechanics (2 hours)
(v) Biomechanics of Joint (2 hours)

3) Mechanisms of Injury – 6 Hours

(i) Overview of Injury Mechanisms
(ii) Principles of Mechanical Loading
(iii) Principles of Injury
(iv) Tissue Injury
(v) Compartment and Entrapment Conditions
(vi) Joint Injury

4) Kinesiology of upper limb, lower limb spine and cardiopulmonary mechanics - 40 Hours

(i) Shoulder complex (4 hours)
(ii) Elbow and forearm complex (4 hours)
(iii) Wrist andHand (2 + 4 = 6 hours)
(iv) Spine (10 hours)
(v) Hip (4 hours)
(vi) Knee (4 hours)
(vii) Ankle and Foot (5 hours)
(viii) Cardiopulmonary Mechanics (3 hours)

5) **Gait Analysis - 10 Hours**
   (i) Fundamentals: Gait Cycle, Phases of Gait, Basic Functions
   (ii) Normal Gait: Ankle Foot Complex, Knee, Hip, Head, Trunk and Pelvis, Arm, Total Limb Function
   (iii) Pathological Gait: Pathological Mechanisms, Ankle and Foot Gait Deviations, Knee Abnormal Gait, Hip Gait Deviations, Pelvis and Trunk Pathological Gait, Clinical Examples
   (iv) Gait Analysis Systems: Motion Analysis, Dynamic Electromyography, Ground Reaction Forces and Vectors, Stride Analysis, Energetic

6) **Measurement Instruments - 11 Hours**
   (i) Goniometer (1 hour)
   (ii) Accelerometer (1 hour)
   (iii) Photo Optical Devices (2 hours)
   (iv) Pressure Transducers & Force Plates (2 hours)
   (v) Gait Analyzer (2 hours)
   (vi) Isokinetic Device (3 hours)

7) **EMG - 5 Hours**
   (i) Electrophysiology of Muscle Contraction
   (ii) Recording
   (iii) Processing
   (iv) Relationship between EMG and Biomechanical Variables

8) **Biomechanical consideration for Orthoses& Prosthesis - 06 Hours**

Reference Books:

1) Winter DA. Biomechanics of human movement. Biomechanics. 1979.

2) Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011 .

3) Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams & Wilkins; 2001.

4) Kapandji IA. Physiology of the Joints E-Book: Volume 2 Lower Limb. Elsevier Health Sciences; 2016 .

5) Soderberg GL. Kinesiology: application to pathological motion. Lippincott Williams & Wilkins; 1997.

6) Smith LK, Weiss L, Lehmkuhl LD. Brunnstrom's clinical kinesiology

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential

learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: MTM 263 Title of the Course: **BIOMECHANICS AND KINESIOLOGY (LAB HOURS)**

L-T-P: 0-0-32 Credits :2

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

The student will be able:

CO-1: To understand and apply knowledge of movement dysfunction into therapeutic expression.
CO-2: To demonstrate skills and techniques used in biomechanics and kinesiology.
CO-3: To demonstrate upper and lower limb joints biomechanics in evaluation and treatment of patients
CO-4: Apply the knowledge of Biomechanics in exercise prescription with clinical reasoning
CO-5: Analyze kinetics and kinematics of all joints & its application in body movements
CO-6: Apply the principles of Biomechanics in prosthetics, orthotics & mobility aids.
CO-7: Prescribe ergonomic alterations at workplace using biomechanical principles.

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	PSO 1	PSO 2	PSO 3
CLO1	3	1	3	3	2	2	2	2	2	3	2	**2**	**3**	**1**	**2**
CLO2	3	2	3	3	3	2	2	2	2	3	2	**2**	**3**	**2**	**3**
CLO3	3	3	3	2	3	2	2	2	2	3	2	**3**	**3**	**3**	**3**
CLO4	3	2	3	3	3	2	2	2	2	3	2	**3**	**3**	**2**	**3**
CLO5	3	3	3	2	3	2	2	2	2	3	2	**2**	**3**	**2**	**3**
CLO6	3	1	2	2	2	2	2	2	2	3	2	**3**	**3**	**1**	**3**
CLO7	3	3	3	3	3	3	3	3	3	3	3	**3**	**3**	**3**	**3**

'3' is for 'High-level' mapping, 2 for 'Medium-level'mapping, 1 for 'Low-level'mapping.

Detailed Syllabus:

This involves application of above topics via demonstrations, field visits and case presentations.

REFERENCE BOOKS

1) Winter DA. Biomechanics of human movement. Biomechanics. 1979.

2) Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011 .

3) Nordin M, Frankel VH, editors. Basic biomechanics of the musculoskeletal system. Lippincott Williams & Wilkins; 2001.

4) Kapandji IA. Physiology of the Joints E-Book: Volume 2 Lower Limb. Elsevier Health Sciences; 2016 .

5) Soderberg GL. Kinesiology: application to pathological motion. Lippincott Williams & Wilkins; 1997.

6) Smith LK, Weiss L, Lehmkuhl LD. Brunnstrom's clinical kinesiology

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY**

Course Code: MTM 264

Title of the Course: **SEMINAR ON CLINICAL ISSUES**

L-T-P: 48-0-0 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

On completion of the study of this course the student should be able to

CO-1: Demonstrate adequate knowledge and skill in seminar presentation.

CO-2: To develop an evidence based presentation on the allocated topic.

CO-3: Debate contentious issues in the efficacy of physiotherapeutic management.

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	3	3	3	3	3	3	1	1	2	3	**2**	**3**	**3**	**3**
CLO2	3	3	3	3	3	3	3	1	1	2	3	**2**	**3**	**3**	**3**
CLO3	3	3	3	3	3	3	3	1	1	2	3	**2**	**3**	**3**	**3**

Detailed Syllabus

These will serve as a platform for students to integrate various components of patient management, and debate contentious issues in the efficacy of physiotherapy techniques. Students will give presentations on topics provided to them. The whole list of topics along with the name of moderator and the date of presentation will be provided to the students at the beginning of the academic session.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY**

Course Code: MTM 265

Title of the Course: **DISSERTATION**

L-T-P: 208-0-0 Credits: 13

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to:

CLO-1: Students should be able to develop a research project and conduct the dissertation writing independently in physiotherapy.

CLO-2: Engage in systematic discovery and critical review of appropriate and relevant information sources.

CLO-3: appropriately apply qualitative and /or quantitative evaluation process to original data, understand and apply ethical standards of conduct in the collection and evaluation of data and other resources.

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	2	3	3	2	3	2	3	1	1	2	2	**2**	**2**	**3**	**3**
CLO2	2	3	3	2	3	2	3	1	1	2	2	**2**	**2**	**3**	**3**
CLO3	2	3	3	2	3	2	3	1	3	2	2	**2**	**2**	**3**	**2**

DETAILED SYLLABUS

As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of faculty/guide/clinician qualified for the purpose as recommended by the Council/University. The student is supposed to do a research in the field of musculoskeletal physiotherapy in his/her area of interest. The research will involve making a research proposal, conduct of the work as per the documented methodology, statistical analyses and dissertation writing. After finishing the study, he/she has to submit the dissertation which will be scrutinized by the examiners for acceptance

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY**

Course Code: MTM 266

Title of the Course: **PHYSIOTHERAPY IN REGIONAL MUSCULOSKELETAL DISORDERS AND LIFE STYLE MEDICINE (THEORY)**

L-T-P: 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

On completion of the study of this Course the student should be able:

CO-1: To perform a comprehensive and complete Physiotherapy assessment of the Orthopaedic trauma
CO-2: To formulate a complete physiotherapy treatment plan of orthopaedic conditions and disorders, regional conditions.
CO-3: It should equip the student to assess and manage paediatric orthopaedic conditions.
CO-4: It should provide the student with a brief overview of lifestyle and occupational medicine.

CO-5: To document systematic, meaningful, accurate written records of the patient.

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	3	2	2	2	2	1	1	1	1	3	1	**3**	**3**	**2**	**2**
CLO2	3	2	2	2	2	1	1	1	1	3	1	**3**	**3**	**2**	**2**
CLO3	3	2	2	2	2	1	1	1	3	3	1	**3**	**3**	**2**	**2**
CLO4	3	2	3	3	3	3	3	1	2	3	2	**3**	**3**	**3**	**3**
CLO5	3	2	3	2	3	3	2	2	2	3	2	**3**	**3**	**3**	**3**

UNIT 1 - 24 Hours

Musculoskeletal assessment, medical and physiotherapy diagnosis, prevention and recent trends in physiotherapeutic management of different non traumatic conditions around the following –

1. Shoulder Joint Complex
2. Elbow joint
3. Wrist and hand
4. Cervical spine
5. Thoracic spine.

UNIT 2 - 24 Hours

Musculoskeletal assessment, medical and physiotherapy diagnosis, prevention and recent trends in physiotherapeutic management of different non traumatic conditions around the following –

1. Pelvic complex
2. Hip joint
3. Knee joint
4. Ankle and foot.

5. Lumbar spine

UNIT 3 - 24 Hours

Basic principles, special exercise consideration, health promotion, disease prevention and physiotherapy assessment and management of musculoskeletal impairments and disability among following:

(i) Musculoskeletal disorders related to Geriatric Health
(ii) Musculoskeletal disorders related to Paediatric Health
(iii) Musculoskeletal disorders related to Women Health
(iv) Musculoskeletal disorders related to use of electronic and computerized gadgets.

Palliative care

a) Concepts of hospice care, terminal illness/care, end of life care, palliative care
b) The concept of dyeing with dignity
c) Ethics in palliative care
d) Important of support systems in managing terminal illness
e) Identifying common needs and preferences of patients with terminal illness
f) Communication Skills and their importance in physiotherapy management
g) Role and members of the multidisciplinary team
h) Alternative treatments
i) Pain and physical symptoms management in palliative care
    - General principles of pain management
    - Various physiotherapeutic methods of pain management
    - Role of opioid, non-opioid and NSAIDs

UNIT 4 - 24 Hours

Lifestyle medicine and physiotherapy

a) Definition and importance
b) Incidence of chronic illness and the contribution of healthy lifestyle to the prevention and treatment of diseases
c) Definition of health and the foundation for good health
d) Physiotherapist's health – self-evaluation, personal goals, the importance of being a role model

Epidemiology, environmental and genetic factors, special exercise consideration and scope of physiotherapy practice and research in health promotion, prevention of disease and musculoskeletal impairments among the following:

a) Obesity including Paediatric Obesity
b) Diabetes Mellitus
c) Mental health disorders
d) Cardio vascular disorders
e) Smoking and Tobacco
f) Impact on musculoskeletal health, School back pack loading

SUGGESTED READINGS

4. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25.

5. Brotzman SB. Clinical orthopaedic rehabilitation. Mosby Incorporated; 1996.
6. Hertling D, Kessler RM. Management of common musculoskeletal disorders. Physical therapy principles and methods. 1996;3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY**

Course Code: MTM 267

Title of the Course: **PHYSIOTHERAPY IN REGIONAL MUSCULOSKELETALDISORDERS AND LIFE STYLEMEDICINE (LAB HOURS)**

L-T-P: 0-0-48 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES

At the end of the course, the learner should be able to:

CO-1: appropriate patient history in the prescribed format
CO-2: Select an appropriate outcome measure and correlate patient examination findings
CO-3: Use appropriate Physiotherapeutic Technique / approaches to treat patients.
CO-4: Discuss the recent management approaches for common conditions and deliberate on best practice model for patient cantered care
CO-5: To interpret the differential diagnosis of various orthopaedic conditions.

CO-6: To apply the various therapeutic techniques for the management of conditions of the musculoskeletal system.

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	PSO 1	PSO 2	PSO 3
CLO1	3	3	3	3	2	3	2	2	2	3	3	**3**	**3**	**3**	**3**
CLO2	3	3	3	3	2	3	2	2	3	3	3	**3**	**3**	**3**	**3**
CLO3	3	3	3	3	3	3	3	3	3	3	3	**3**	**3**	**3**	**3**
CLO4	3	3	3	3	2	3	2	2	2	3	3	**3**	**3**	**3**	**3**
CLO5	3	3	3	3	3	3	3	3	3	3	3	**3**	**3**	**3**	**3**
CLO6	3	3	3	3	3	3	3	2	3	3	2	**3**	**3**	**3**	**3**

DETAILED SYLLABUS

This involves application of topics in MTM-267 through demonstrations, field visits and case presentations etc.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Reference books:

1. Magee DJ. Orthopedic physical assessment-E-Book. Elsevier Health Sciences; 2014 Mar 25.
2. Brotzman SB. Clinical orthopaedic rehabilitation. Mosby Incorporated; 1996.
3. Hertling D, Kessler RM. Management of common musculoskeletal disorders. Physical therapy principles and methods. 1996;3.

Name of the Academic Program: **MASTER OF PHYSIOTHERAPY**

Course Code: MTM 268

Title of the Course: **CLINICAL TRAINING**

L-T-P: 0-0-592 Credits: 37

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES

At the end of the course student will have:

CO-1: Understanding of community and health care workers
CO-2: Understanding the assessment of a patient and its management
CO-3: Understanding of different departments in a hospital.
CO-4: Understanding basic knowledge of modality and its implementation
CO-5:Understanding basic knowledge of musculoskeletal rehabilitation, disability evaluation and its implementation.
CO-6: Understanding the recent advance techniques in musculoskeletal rehabilitation and its application.

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CLO1	1	3	2	2	2	3	2	3	2	1	3	**1**	**1**	**3**	**2**
CLO2	3	3	3	3	3	3	1	3	2	3	3	**2**	**3**	**3**	**3**
CLO3	1	3	2	1	1	3	1	1	1	1	1	**1**	**1**	**3**	**1**
CLO4	3	1	3	3	3	2	2	1	1	2	1	**1**	**1**	**1**	**1**
CLO5	3	3	3	3	3	3	2	2	2	3	2	**2**	**3**	**3**	**3**
CLO6	3	3	3	3	3	3	3	1	1	3	2	**1**	**3**	**3**	**3**

DETAILED SYLLABUS

Students will be engaged in clinical practice in Physiotherapy Departments and Orthopedic In-Patient department in the Orthopaedics setting to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.