GURU KASHI UNIVERSITY

Masters of Physiotherapy
(MUSCULOSKELETAL)
Session: 2023-24

Department of Physiotherapy

GRADUATE OUTCOMES OF PROGRAMME

The graduates will be capable of strengthening their abilities for widening knowledge and skills through meaningful learning experiences using Advanced Techniques and critical thinking to develop expertise in their area and offer exclusive services in clinical practice; they will be able to delineate the cognitive and psychomotor skills deemed essential for completing this program and to perform as a competent Orthopaedic Physiotherapist who will be able to evaluate plan and execute Physiotherapy treatment independently following Evidence-based Practice.

PROGRAMME LEARNING OUTCOMES

After the completion of this programme the learner will be able to:

- Application and understanding of knowledge of sciences pertaining to musculoskeletal system with sound clinical reasoning
- Comprehension of detailed knowledge of musculoskeletal injuries and rehabilitation
- Evaluation of mechanics of musculoskeletal injuries
- Professional ethic towards client respect, dignity and confidential responsibility
- Evaluation of disability of patients pertinent to musculoskeletal conditions and to be able to prescribe exercises based on dosimetry
- To be an Active Participant of Evidence-based practice model

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Program Structure

Semester –I						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credit**
MPM101	Review of Basic Sciences	Core	4	0	0	4
MPM102	Review of Basic Therapeutics	Core	4	0	0	4
MPM103	Musculoskeletal Disorders	Core	4	0	0	4
MPM104	Exercise Physiology	Core	4	0	0	4
MPM105	Musculoskeletal Anatomy Lab	Skill Based	0	0	4	2
MPM106	Physiotherapeutics Lab	Skill Based	0	0	4	2
MPM107	Assessment and Evaluation in Musculoskeletal Disorders Lab	Skill Based	0	0	4	2
Discipline Elective (Any one of the following)						
MPM108	Hand Rehabilitation	Discipline Elective	3	0	0	3
MPM109	Foot Rehabilitation					
Total			**19**	**0**	**12**	**25**

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Semester –II						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credit**
MPM201	Advanced Therapeutics	Core	4	0	0	4
MPM202	Physiotherapy for Traumatic Musculoskeletal Conditions	Core	4	0	0	4
MPM203	Rehabilitation, Orthotics and Prosthetics	Core	4	0	0	4
MPM204	Skill Enhancing Studies	Core	4	0	0	4
MPM205	Clinical Biomechanics Lab	Skill Based	0	0	4	2
MPM206	Electrodiagnosis Lab	Skill Based	0	0	4	2
MPM207	Advanced Manipulative Skills Lab	Skill Based	0	0	4	2
MPM210	Proprioceptive Neuromuscular Facilitation Technique	Value Added Course	2	0	0	2
Discipline Elective (Any one of the following)						
MPM208	Advanced Functional and Physical Diagnosis	Discipline Elective	3	0	0	3
MPM209	Advanced Manipulative Skills					
Total			**21**	**0**	**12**	**27**

Semester –III						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credit**
MPM301	Research Methodology	Compulsory Foundation	4	0	0	4
MPM302	Research Proposal	Research Based Skills	2	0	4	4
MPM303	Ethics and IPR	Skill Based	2	0	0	2
MPM304	Proficiency in Teaching	Skill Based	2	0	0	2
MPM305	Computer Lab	Skill Based	0	0	4	2
MPM306	Service Learning	Community Linkage	0	0	4	2
MPM399	XXX	MOOC	-	-	-	4
Total			**10**	**0**	**12**	**20**

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Semester –IV						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credit**
MPM401	Dissertation	Research Skill	-	-	-	20
Total			**0**	**0**	**0**	**20**
Grand Total			**50**	**0**	**36**	**92**

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Evaluation Criteria for Theory Courses

A. Continuous Assessment: [25 marks]
   CA1-Surprise Test (Two best out of three)- (10 Marks)
   CA2-Assignment(s)- (10 Marks)
   CA3-Term Paper/Quiz/Presentations- (05 Marks)
B. Attendance: [05 Marks]
C. Mid Semester Test: [30 Marks]
D. End Semester Exam: [40 Marks]

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SEMESTER-I

Course Title: REVIEW OF BASIC SCIENCES
Course Code: MPM101

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning Outcomes

After the completion of this course learners will be able to:
1. Analyse structure and classification of various bones and joints of the body.
2. Acquire knowledge about central nervous system and various plexus of the body.
3. Acquire knowledge about the pathology of the body.
4. Identify various drugs acting on central nervous system, muscle relaxants, steroids and local anaesthetics.

Course Content

UNIT I **16 Hours**

Human Anatomy: Osteology: Basic terminology, composition, function, classification of Bone. Structural details of bones of whole body.
Arthrology: Definition and Classification of Joints, movements of Joints; Description of Joints of Upper and Lower Extremities with their Ligaments, Vertebral Column.
Myology: Classification and Structure of Muscles, Description of all major muscles with their origin, Insertion, nerve supply and action.

UNIT II **15 Hours**

Human Physiology: Musculoskeletal System- bones, cartilages, muscles, ligaments etc; Muscle Physiology; Structure and function of muscle fibers; Mechanism of muscle contraction; Exercise Physiology.
Respiratory Responses to Exercise; Ventilation at rest and during exercise; Ventilation and the Anaerobic Threshold; Alveolar Ventilation and Dead Space; Lung Volumes and Capacities; Oxygen Cost of Breathing; Second Wind.
Cardiovascular Responses to Exercise: Control and Regulation of Heart and Circulation at rest and during exercise; Exercise and Acid Base Balance; Acid and Base Buffers; pH; Respiratory Regulation of Ph; Alkali Reserve.
Hormonal responses to exercise: Growth hormone (GM); Thyroid and Parathyroid Hormones; Anti diuretic Hormone; (ADM) and Aldosterone; Insulin and Glucagon; The catecholamine; Epinephrine and norepinephrine; Sex hormones; Glucocorticoids (Cortisol) and Adrenocorticotrophic; Prostaglandins and Endorphins

UNIT III **14 Hours**

Cardiovascular system: Structure & Properties of heart; Cardiac Cycle; The regulation of heart's performance; Cardiac output; The arterial blood pressure; The physiology of vascular system.
Lymphatic circulation.
Respiratory system: Functional anatomy; Ventilation & control of ventilation; Alveolar air; Regulation of the breathing; Pulmonary function test.
Pharmacology: Drugs used in pain; Local anaesthetics; Steroids; Muscle relaxants; Drug acting upon central nervous systems & autonomic nervous system; Topically acting drugs.

UNIT IV **13 Hours**

Pathology: Cell Injury; Inflammation; Repair; Immune system; Musculoskeletal system; Bones; Hereditary & Metabolic diseases; Osteoporosis; Rickets; Osteomalacia; Osteitis fibrosa cystica; Renal Osteodystrophy; Gout; Crystal Synovitis; Infections; Osteomyelitis; Tuberculosis; Joints; Degenerative joint disease; Bursitis; Skeletal muscles; Muscle atrophy; Myositis ossificans; Muscular dystrophy; Myasthenia gravis; Hemophilia and other bleeding disorders; Delayed Healing responses in soft tissue injuries
Biochemistry: Diet- it's nutritional and calorific value of various foods balance diet, energy requirement of various individuals

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Cash'TB for Ortho and rheumatology for physiotherapist by Downie*
- *Orthopaedic rehabilitation by Brookman*
- *Walker, B. R., &Colledge, N. R. (2013). Davidson's principles and practice of medicine.*
- *Mohn & Gaectier (1995). Guided to clinical Neurology. Churchill Livingstone.*
- *Thompson, A. (2013). Tidy's Physiotherapy. Varghese publishing House.*
- *Maheshwari, J., &Mhaskar, V. A. (2019). Essential orthopaedics: (including clinical methods). Jaypee Brothers Medical.*

Web Sources

- *https://www.verywellhealth.com/what-is-a-plexus-5079595*
- *https://my.clevelandclinic.org/health/diagnostics/17966-pulmonary-function-testing*
- *https://www.ncbi.nlm.nih.gov/books/NBK538180/*
- *https://www.life.illinois.edu/mcb/458/private/lectures/ppt_pdf/Path_ggf_3_2020.pdf*

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Course Title: REVIEW OF BASIC THERAPEUTICS
Course Code: MPM102

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes

After the completion of this course learners will be able to:

1. Discover about various assessment techniques in exercise therapy.
2. Acquire knowledge about low, medium and high frequency currents.
3. Identify various electro diagnostic techniques.
4. Develop skills to prescribe orthosis and prosthesis for the patients.

Course Content

UNIT I **16 Hours**

Exercise Therapy: Assessment techniques like MMT & Goniometry; Stretching and mobilization; Re-education and strengthening; Balance and Co-ordination exercises; Gait analysis and training (both normal & pathological gait); Relaxation & soft tissue manipulation; Posture; PNF; Traction; Hydrotherapy.

UNIT II **15 Hours**

Electrotherapy: General review of low, medium & high frequency currents and their modifications like Diadynamic and Russian currents; Ultrasound; UVR and IRR; Cryotherapy; Intermittent pneumatic compression; Other thermal modalities (Heat and Cold); Laser Therapy.

Unit III **14 Hours**

Biomechanics and Pathomechanics: Introduction to Kinesiology and Biomechanics; Principle of Biomechanics, Nature and importance of Biomechanics in Physiotherapy; Introduction to Biomechanics, Analysis of human motion. Analytical tools and techniques — Isokinetic dynamometer, Kinesiological EMG, Electronic goniometer, Force platform, Videography; Shoulder, Elbow, Wrist and Hand; Pelvis, Hip, Knee, Ankle & Foot; Spine; Posture & Gait analysis

UNIT IV **15 Hours**

Bio Engineering: Principles of Orthotic- types, indications, contraindications, assessment (checkout), uses and fitting- region wise; Fabrication of simple splints and self-help devices for upper and lower extremity- indications and applications; Orthotics for the Upper Limb; Orthotics for the Lower Limb; Orthotics for the Spine; Principles of Prosthetics- types, indications, contraindications, assessment checkout, uses and fitting — region wise; Principles of Vocational Problems, including Evaluation and Vocational Goals for People with Disability.

Transaction mode

Flipped teaching, Open learning, Group discussion**,** Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested readings

- *Powers, SK and Howley, ET (2001). Exercise Physiology. Mc Graw Hill*
- *McArdle, WD, Katch, FI & Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.*
- *Short Textbook of Prosthetics and Orthotics by R Chinnathurai, P Sekar, M Ramaa Kumar, K Nithya Manoj, C Senthil Kumar*
- *Therapeutic Exercise for Sports Injuries (2017). Dr. Fatemeh Karami Borzabad, Dr. C. Venkatesh.*

Web Sources

- *https://www.uofmhealth.org/conditionstreatments/rehabilitation/orthotics-and-prosthetics*
- *https://neprisstore.blob.core.windows.net/sessiondocs/doc_8bcc0054-946f-4820-82e0-ca169a8823b7.pdf*
- *https://accessphysiotherapy.mhmedical.com/content.aspx?bookid=475&sectionid=40791200*

Course Title: MUSCULOSKELTAL DISORDERS
Course Code: MPM103

L	T	P	Credits
4	0	0	4

Learning outcomes **Total Hours- 60**

After the completion of this course learners will be able to:

1. Analyse various diseases which can have an impact on the performance of an individual.
2. Develop skills to diagnose deformities and mal-alignments.
3. Acquire knowledge about pathology and prognosis of contagious diseases affecting bones.
4. Detect the various spinal deformities.

Course Content

UNIT I **16 Hours**

Fractures: Definition, types, signs and symptoms. Fracture healing. Complications of fractures, conservative and surgical approaches; Principles of management – reduction (open, closed, immobilization etc.); Subluxation/ dislocations – definition, signs and symptoms, principles of management (conservative and operative); Upper Limb Fractures and Dislocations: Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the major long bone fractures and joint injuries, Fractures of the clavicle; Lower Limb Fractures and Dislocations: Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the major long bone fractures and joint injuries; Spinal Fractures and Dislocations: Mechanism of injury, clinical features, complications (quadriplegia) and management of Spinal injuries and rib cage fractures (collar, cast, brace, traction), management of complication (bladder and bowel, quadriplegia); Congenital disorders of vertebral column & vertebral deformities.
Rheumatoid arthritis; Ankylosis Spondylosis; Reiter's disease; Polymyalgia rheumatica; Inflammatory disorders of vertebrae, vertebral Joints, soft tissues.

UNIT II **15 Hours**

Shoulder injuries: impingement, rotator cuff injuries, glenoid labrum injuries, instability of shoulder, AC Joint injuries, referred pain and other less common causes of shoulder pain; Specific rehabilitation protocols: Acute, recovery and functional phase.

Acute elbow injuries; Forearm compartment pressure syndromes.
Hip & Groin Pain: History examination & investigation; Causes and management of adductor muscle strains (including recurrent), osteitis pubis, adductor tendinopathy, obturator neuropathy and trochanteric bursitis & other less common conditions.
Knee injuries: Review of functional anatomy; History examination & investigation; Causes and management of meniscal injuries, collateral ligament injuries cruciate ligament injuries, articular cartilage damage, acute patellar trauma and chronic instability; Rehabilitation protocols of the above-mentioned injuries; Causes & Management of Patellofemoral syndrome, Patellofemoral instability, Patellar tendinopathy, Fat pad impingement, acute & chronic Partial tears, Osgood Schlatter's Disease, Sinding -Larsen-Johansson Syndrome and Quadriceps tendinopathy; Causes & Management of iliotibial band friction syndrome, excessive lateral pressure syndrome, biceps femoris tendinopathy, precancerous tendinopathy, popliteus tendinopathy, Biceps Femoris tendinopathy& Baker's cyst.

UNIT III **14 Hours**

Metabolic and endocrine disorders: Osteoporosis; Osteomalacia and Rickets; Hyper parathyrodism; Causes, assessment of a patient with Low Back pain, & stiffness disorders; Traumatic Injuries of vertebral column: General & regional injuries; Neuromuscular disorders: Poliomyelitis; Cerebral palsy; Muscular dystrophy; Pelvic injuries; Spinal cord Injuries: Types, Classifications, Pathology, Level, Examination, Management & Physiotherapy.

UNIT IV **13 Hours**

Orientation and General principles of Orthopaedic surgery: Arthrodesis; Osteotomy; Arthroplasty; Bone grafting; Internal and external fixations; Distraction and limb reconstruction; Correction of bone deformities and joint contractures; Tendon transfers; Nerve suturing and grafting; Causes & Management of Inflammatory shin pain and Compartment Syndromes Acute bony injuries: Peri osteal Contusion & fractured tibia & fibula; Causes and Management of gastrocnemius & soleus muscle strain; Claudication type of calf pain; Causes and management of Achilles tendinopathy, Achilles tendon rupture, Retro calcaneal bursitis, Sever's disease and Posterior impingement syndrome.

Transaction Mode

Demonstration method, Video based teaching, Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested readings

- *Management Principles for Physiotherapist by Nosse, Lorry J*
- *Essential of Orthopaedic for physiotherapists by Ebnezar*
- *Physical therapy of the low back by Twomey, Churchill, Livingstone, London 1995*
- *Myofascial and pain dysfunction by Travell, Villimans and Wilkins, Baltimore 1983*
- *Orthopaedic Physical therapy by Donatteli, London Churchill Livingstone*

Web Sources

- *https://www.physiopedia.com/Long_Term_Musculoskeletal_Conditions*
- *https://my.clevelandclinic.org/health/diseases/22176-pelvic-fractures*
- *https://www.sciencedirect.com/journal/burns*
- *https://www.physio-pedia.com/Spinal_Cord_Injury*

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Course Title: EXERCISE PHYSIOLOGY
Course Code: MPM104

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes
After the completion of this course learners will be able to:

1. Discover about the metabolism process in the human body.
2. Analyze performance based on certain parameters by undertaking tests.
3. Acquire knowledge about effects of Exercise on various Body Systems.
4. Develop skills to assess body changes in various environments.

Course Content

UNIT I **16 Hours**

Bioenergetics: Bioenergetics of exercises; Basal Metabolic Rate; Resting Metabolic Rate; Factors affecting Resting Metabolic Rate; Energy cost of exercise; MET; Physical activity classification based on energy expenditure.

UNIT II **15 Hours**

Energy systems: Role of aerobic and anaerobic mechanism during exercises; Acute effects of high, burst and short duration exercises; Exercise testing planning and prescription; Body temperature regulation.

Unit III **14 Hours**

Exercise Impact: Respiratory response to exercise; Cardiovascular response to exercise; Hormonal response to exercise; Exercise and acid base balance; Conditioning exercise for strength, duration and flexibility.

UNIT IV **15 Hours**

Exercise in the Cold: Effects of exposure to cold and severe cold; Wind chill; Temperature receptors; Role of hypothalamus; Frost Bite and other problems.
Exercise at Altitude: Exercise at altitude immediate physiological responses at high altitude; Physiological basis of altitude training; Phases of altitude training and specific training effects; Altitude acclimatization; Disorders associated with altitude training.

Exercise and body fluids: Measurement and regulation of body fluids; Body fluid responses and adaptations to exercise; Effects of dehydration and fluid replenishment on physiological responses to exercise and performance; Fluid/carbohydrate replacement beverages.

Transaction mode

Flipped teaching, Open learning, Group discussion**,** Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested readings

- *Powers, SK and Howley, ET (2001). Exercise Physiology. Mc Graw Hill*
- *Fahey, TD, White, TP. Mayfield Publishing Company (1996). Exercise Physiology-Human Bioenergetics and its Application. Brooks, GA,*
- *McArdle, WD, Katch, FI & Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.*

Web Sources

- *https://conductscience.com/introduction-to-bioenergetics*
- *https://www.healthline.com/health/fitness-exercise/difference-between-aerobic-and-anaerobic*
- *https://teachmephysiology.com/respiratorysystem/regulation/responses-respiratory-system-stress/*
- *https://www.aston.ac.uk/sport/news/tips/fitness-exercise/benefits-training-cold-weather*

Course Title: MUSCULOSKELETAL ANATOMY LAB
Course Code: MPM105

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Develop an in-depth knowledge of musculoskeletal system to help assess and manage musculoskeletal impairments.
2. Evaluate and prevent secondary impairments and/or pathologies across systems.
3. Analyse the "root cause" of impairments in musculoskeletal conditions.
4. Inspect the Somatosensory System.

Course Content

Visual inspection of surface anatomical markings on self and Peers.
Palpation of surface anatomical markings on self and Peers.
Identification of musculoskeletal structures and organs in anatomical models and/or platinated specimens.
Somatosensory Examination.
Functional integration of the musculoskeletal System.

Transaction Mode
Demonstration method, Case based teaching, Video based teaching, Group Discussion.

Suggested Readings

- *Gray's Anatomy: The Anatomical Basis of Clinical Practice*
- *Richard S. Snell- Clinical Anatomy by Regions*
- *White and Punjabi – Clinical Biomechanics of Spine – Lippincott.*
- *Lynn S. Lippert- Clinical Kinesiology and Anatomy*
- *Carolyn Oatis- Kinesiology of musculoskeletal system.*

Web Sources

- *https://theodora.com/anatomy/surface_anatomy_index.html*
- *https://www.kenhub.com/en/library/anatomy/the-musculoskeletal-system*
- *https://www.healthdirect.gov.au/bones-muscles-and-joints*
- *https://www.healthdirect.gov.au/bones-muscles-and-joints*

Course Title: PHYSIOTHERAPEUTICS LAB
Course Code: MPM106

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:
1. Analyze the principles of bedside assessment of bed ridden patient.
2. Design proficiently the application and demonstration of Manual therapy and Exercise Physiology
3. Evaluate the outcome of the assessment for musculoskeletal tissues
4. Comprehend the effects of poor posture and its evaluation.

Course Content

Bedside Evaluation and Therapeutic Skills.
Electro physiology, Electro diagnosis, Manual therapy, Exercise Physiology.
Assessment of Tone, flexibility, tightness of musculoskeletal tissues.
Postural assessment methods.
Common deviations from the normal posture.

Transaction Mode

Demonstration method, Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Kisner, C., Colby, L. A., & Borstad, J. (2017). Therapeutic exercise: foundations and techniques. Fa Davis. The Principle of Exercise Therapy -Gardiner (2005) - C.B.S. Delhi.*
- *Norkin, C. C., & White, D. J. (2016). Measurement of joint motion: a guide to goniometry. FA Davis.*
- *Gardiner, M. D. (1973). Principles of Exercise Therapy: M Dena Gardiner.*

Web Sources

- *https://www.physio-pedia.com/Electrodiagnosis*
- *https://www.ucsfhealth.org/education/electrophysiology-procedure*
- *https://www.physio4all.com/therapies/manual-therapy/*
- *https://www.physio-pedia.com/Sports_Screening:_Postural_Assessment*

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Course Title: ASSESSMENT AND EVALUATION IN MUSCULOSKELETAL DISORDERS LAB

Course Code: MPM107

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Develop observation and palpation skills.
2. Chart out muscle strength and joint range of motion.
3. Acquire expertise in using functional scales for assessment.
4. Analyze special tests to draw an appropriate diagnosis.

Course Content

Assessment and evaluation based on Maitland and Cyriax Concepts, Physical disability evaluation and ICF classification.
Clinical Gait assessment, Postural assessment, Functional assessment, Geriatric assessment, Assessment of amputee.
Balance, tone, flexibility, sensory and motor assessment, Muscle testing, limb length and reflex testing.
Examination of spine, Examination of upper limb (shoulder, elbow, wrist & hand) and Examination of lower extremity (pelvis, hip, knee, ankle and foot).

Transaction mode

Group discussion, Video based teaching, open learning, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested readings

- *Magee, D. J. (2014). Orthopedic physical assessment-E-Book. Elsevier Health Sciences.*
- *Johanson, M. A., Donatelli, R., Wooden, M. J., Andrew, P. D., & Cummings, G. S. (1994). Effects of three different posting methods on controlling abnormal subtalar pronation. Physical Therapy, 74(2), 149-158.*
- *Maheshwari, J., & Mhaskar, V. A. (2019). Essential orthopaedics:(including clinical methods). Jaypee Brothers Medical Publishers.*

- *Brotzman, S. B., & Manske, R. C. (2011). Clinical orthopaedic rehabilitation e-book: An evidence-based approach-expert consult. Elsevier Health Sciences.*

Web Sources

- *https://www.physio-pedia.com/Maitland%27s_Mobilisations*
- *https://fairfieldphysiotherapy.com.au/postural-assessment-need-one/*
- *https://www.physio-pedia.com/Balance*
- *https://musculoskeletalkey.com/sensory-motor-and-reflex-examination/*

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Course Title: HAND REHABILITATION
Course Code: MPM108

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning outcomes

After the completion of this course learners will be able to:

1. Evaluate the sensory and motor functions of the hand.
2. Develop an in-depth knowledge of Hand to help assess and manage hand impairments.
3. Implement special tests to draw an appropriate diagnosis.
4. Comprehend the uses of Orthosis and Prosthesis.

Course Content

UNIT I **11 Hours**

Functions of Hand as Sensory and Motor Organ: Pathomechanics of hand; Classification of hand injuries and principles of hand rehabilitation (Functional and Vocational Training).

UNIT II **11 Hours**

Tendon Injuries of Hand; Nerve injuries and entrapments; Crush Injuries of Hand; Acute Injuries of the wrist; History, examination, investigation and management of fractures of distal radius and ulna, scaphoid and hook of the hamate and dislocation of the carpal bones; Chronic Injuries of the wrist; History, examination, investigation and management of common injuries; Hand and finger injuries; History, examination, investigation and management of hand injuries: fracture of the meta carpals & Phalanges, dislocation of MCP Joints and finger joints, ligament &tendon injuries and laceration & infections of the hand.

UNIT III **12 Hours**

Burns in hand; Spastic hand; Rheumatoid hand; Hand in Hansen's disease; Reflex sympathetic dystrophy.

UNIT IV **11 Hours**

Prosthetic hand; Orthosis for hand and their uses; Management of Orthosis and Prosthesis.

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Hand Rehabilitation by Christine, Churchcill, Livingstone London 1995*
- *Cash's Textbook for Ortho and Rheumatology for physiotherapist by Downie*
- *Orthopaedic Physical therapy by Donatteli, London Churchill Livingstone*

Web Sources

- *https://www.physio-pedia.com/Hand_Function*
- *https://www.physiopedia.com/Biomechanics_of_Hand_and_Wrist_Defomities_in_Rheumatoid_Arthritis*
- *https://www.mayoclinic.org/diseasesconditions/burns/diagnosistreatment/drc-20370545*
- *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7543843/*

IQAC

Course Title: FOOT REHABILITATION
Course Code: MPM109

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning outcomes

After the completion of this course learners will be able to:

1. Evaluate the Pathomechanics of the foot.
2. Develop an in-depth knowledge of foot to help assess and manage foot impairments.
3. Implement special tests to draw an appropriate diagnosis.
4. Comprehend the uses of Orthosis and Prosthesis.

Course Content

UNIT I **11 Hours**

Pathomechanics of foot; Classification of foot injuries and principles of foot rehabilitation.

UNIT II **11 Hours**

Tendon Injuries; Crush Injuries; Acute Ankle Injuries; Functional Anatomy; Clinical Approach to the patient with Acute Ankle Injuries: History examination & investigation; Causes & Management of Lateral and medial ligament injuries and Persistent pain after ankle sprain; Ankle Pain; Clinical Approach to the patient with Medial, Lateral & medial calcaneal nerve entrapment, Peroneal & Tibialis Anterior tendinopathy, Sinus tarsi syndrome Anterior, Antero lateral impingement; Foot Pain; Clinical Approach to the patient with Rea foot Midfoot & Forefoot Pain: History examination & Investigation.

UNIT III **12 Hours**

Aetiology and Management of the following Conditions: Hallux Rigidus; Spastic Foot; Diabetic Foot; Bunions; Plantar Fasciitis; CTEV.

UNIT IV **11 Hours**

Prosthetic foot; Orthosis for foot and their uses; Management of Orthosis and Prosthesis

Transaction mode

Flipped teaching, Open learning, Group discussion**,** Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested readings

- *Baxter's The Foot and Ankle in Sport- David Porter, Lew Schon, 2020 David Porter, Lew Schon*
- *Rehabilitation of the Foot- Sammarco, V. James, 1995*
- *Sarrafian's Anatomy of the Foot and Ankle: Descriptive, Topographic, Functional- Armen S. Kelikian*
- *Bone and Joint Disorders of the Foot and Ankle: A Rheumatological Approach- Maurice Bouysset*

Web Sources

- *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC164367/*
- *https://medlineplus.gov/diabeticfoot.html*
- *https://orthoinfo.aaos.org/en/diseases--conditions/sprained-ankle*
- *https://www.physio-pedia.com/Plantar_Fasciitis*

IQAC

SEMESTER-II

Course Title: ADVANCED THERAPEUTICS
Course Code: MPM201

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes
After the completion of this course learners will be able to:

1. Acquire knowledge about the recent developments and innovations in the field of musculoskeletal physiotherapy.
2. Apply physiotherapy treatment using hi-tech equipments
3. Advocate manual therapy treatment to the patients.
4. Design a rehabilitation protocol by inculcating advanced therapeutic techniques.

Course Content

UNIT I **16 Hours**

Group therapies: Combined movement therapy; Group exercises; Manual therapy; Myofascial release; Positional release technique; Muscle energy technique; Relaxation technique; Massage therapy.

UNIT II **15 Hours**

Mobilization; Soft Tissue Release; Butler mobilization; Mulligan Concept; Cyriax Concept; Maitland mobilization; McKenzie technique.

UNIT III **14 Hours**

Kinesiotaping; Vacuum Therapy; EMG; Biofeedback.

UNIT IV **13 Hours**

Ambulation; Transfer techniques; Wheelchair: Design, types, management, modifications, prescription; Hydrotherapy.

Transaction Mode
Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Maitland, G. D. (1986). Vertebral manipulation. Elsevier Health Sciences. Muscle Energy Technique, Leon chaitow, Churchill Livingstone.*
- *Chaitow, L. (2007). Positional Release Techniques E-Book. Elsevier health sciences.*
- *Hing, W., Hall, T., Rivett, D. A., Vicenzino, B., & Mulligan, B. (2014). The Mulligan Concept of Manual Therapy-eBook: Textbook of Techniques. Elsevier Health Sciences.*

Web Sources

- *https://musculoskeletalkey.com/introductiontocombinedmovementtheory/*
- *https://us.humankinetics.com/blogs/excerpt/what-is-positionalrelease-therapy*
- *https://www.physio-pedia.com/Muscle_Energy_Technique*
- *https://www.physio-pedia.com/Mulligan_Concept*

IQAC

Course Title: PHYSIOTHERAPY FOR TRAUMATIC MUSCULOSKELETAL CONDITIONS
Course Code: MPM202

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes

After the completion of this course learners will be able to:

1. Discover the various musculoskeletal conditions resulting from trauma.
2. Acquire knowledge about the various orthopaedic surgeries.
3. Analyze the complications associated with fractures.
4. Design post injury and post-surgery rehabilitation programme.

Course Content

UNIT I **16 Hours**

Fractures: Principles of management – reduction (open, closed, immobilization etc.); Principles of management (conservative and operative) for Subluxation/ dislocations; Conservative and surgical management of the major long bone fractures and dislocation of Upper Limb; Conservative and surgical management of the major long bone fractures and dislocation of Lower Limb; Management of Spinal fractures and rib cage fractures (collar, cast, brace, traction), management of complication (bladder and bowel, quadriplegia); Physiotherapy assessment in fracture cases (Upper limb, Lower Limb and Spine) Principles of PT management in fracture cases – guidelines for treatment during immobilization and after immobilization period. Physiotherapy management in complications (early and late); Prosthetic Training.

UNIT II **15 Hours**

Pre- and post-operative physiotherapy assessment, goals, precautions and PT management for the following orthopedic surgeries: Rotator Cuff Tendon Repair; SLAP Repair; Acromioclavicular Joint Repair; Biceps Tendon Surgery; Cubital Tunnel Release; Tommy John surgery; Synovectomy; Spinal stabilization surgeries; Hip Resurfacing; Watson-Jones anterior approach; Meniscectomy; Patellectomy; Regional Arthroplasty; Arthrodesis; Regional Arthroscopy; Osteotomy; Meniscus Repair; ACL Reconstruction; Arthrodesis; Ankle Fusion; Lateral Ankle Ligament Reconstruction; Brostrom Procedure.

Pre- and post-operative physiotherapy assessment, goals, precautions and PT

management for the following corrective surgeries: Bone grafting; Bone Lengthening; Tendon transfers; Soft Tissue release- tenotomy, myotomy, lengthening; Nerve Repair and grafting.

UNIT III **14 Hours**

Pre- and post-operative physiotherapy assessment, goals, precautions and PT management for the following conditions: Shoulder injuries: impingement, rotator cuff injuries, glenoid labrum injuries, instability of shoulder, AC Joint injuries, referred pain and other less common causes of shoulder pain; Acute elbow injuries; Forearm compartment pressure syndromes; Hip & Groin Pain-Adductor muscle strains (including recurrent), osteitis pubis, adductor tendinopathy, obturator neuropathy and trochanteric bursitis & other less common conditions; Knee injuries-Meniscal injuries, collateral ligament injuries cruciate ligament injuries, articular cartilage damage, acute patellar trauma and chronic instability; Causes & Management of Patellofemoral syndrome, Patellofemoral instability, Patellar tendinopathy, Fat pad impingement, acute &chronic Partial tears, Osgood Schlatter's Disease, Sinding -Larsen-Johansson Syndrome and Quadriceps tendinopathy; Iliotibial band friction syndrome, excessive lateral pressure syndrome, biceps femoris tendinopathy, precancerous tendinopathy, popliteus tendinopathy, Biceps Femoris tendinopathy& Baker's cyst.

UNIT IV **15 Hours**

Pre- and post-operative physiotherapy assessment, goals, precautions and PT management for the following conditions: Peri osteal Contusion & fractured tibia & fibula; Gastrocnemius & soleus muscle strain; Claudication; Achilles tendinopathy, Achilles tendon rupture, Retro calcaneal bursitis, Sever's disease and Posterior impingement syndrome; Burns- classification, degrees, Rule of Nine, PT assessment, aims, pre and postoperative PT management; Amputation- level of amputation of upper limb and lower limb, PT assessment, aims, pre and postoperative PT management, stump care, stump bandaging, pre and post prosthetic management including check out of prosthesis, training, complications and its management.

Transaction mode

Flipped teaching, Open learning, Group discussion**,** Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested readings

- *Maheshwari, J., & Mhaskar, V. A. (2019). Essential orthopaedics:(including clinical methods). Jaypee Brothers Medical Publishers.*
- *Brotzman, S. B., & Manske, R. C. (2011). Clinical orthopaedic rehabilitation e-book: An evidence-based approach-expert consult. Elsevier Health Sciences.*
- *Thompson, A. (2013). Tidy's Physiotherapy. Varghese publishing House.*
- *Sullivan, S. (2013). Physical Rehabilitation Assessment and Treatment. Jaypee brothers, Delhi*

Web Sources

- *https://www.physio-pedia.com/Osteotomy*
- *https://www.healthline.com/health/meniscectomy*
- *https://www.spine-health.com/glossary/arthrodesis*
- *https://www.physio-pedia.com/Amputations*

IQAC

Course Title: REHABILITATION, ORTHOTICS AND PROSTHETICS
Course Code: MPM203

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes

After the completion of this course learners will be able to:

1. Evaluate various disabilities based on standardized guidelines and classification.
2. Analyze the different models of rehabilitation and the role of rehabilitation team members
3. Design and implement a rehabilitation programme as per the needs of an individual.
4. Synthesize appropriate orthosis and prosthesis for the patients.

Course Content

UNIT I **16 Hours**

Rehabilitation: Conceptual framework of rehabilitation; Role of Physiotherapist in the rehabilitation team; Role of Rehab Nurse; Model of service delivery.

UNIT II **15 Hours**

Preventive aspects of disability: Epidemiology of disability; Legal Aspect in Disabilities; Govt and NGO participation in disability

UNIT III **14 Hours**

Socio-economic independency; Principles and methods of vocational and social rehabilitation; An outline of the principles and process of disability evaluation

UNIT IV **15 Hours**

Orthotics & Prosthetics: Principles of Orthotics; Principles of prosthesis; Prosthetics and orthotics used for various conditions; Prescription of prosthetics and orthotics

Transaction Mode

Demonstration method, Video based teaching, Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested readings

- *Sullivan, S. & Schmitz (2013). Physical Rehabilitation – Assessment and Treatment. F. A. Davis.*
- *Lusardi, M. M., Jorge, M., & Nielsen, C. C. (2013). Orthotics and prosthetics in rehabilitation. Elsevier Health Sciences.*

Web Sources

- *https://www.physio-pedia.com/Rehabilitation_Team_Members*
- *https://www.physio-pedia.com/Rehabilitation_Frameworks*
- *https://www.who.int/health-topics/disability*
- *https://www.physio-pedia.com/Category:Prosthetics_and_Orthotics*

IQAC

Course Title: SKILL ENHANCING STUDIES
Course Code: MPM204

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning outcomes

After the completion of this course learners will be able to:

1. Acquire Administrative and Management Skills.
2. Apply the Concepts and Methods of Teaching and Learning in their practice.
3. Manage the physiotherapy department after the completion of the course.
4. Manoeuvre the A.V. Aids.

Course Content

UNIT I **11 Hours**

Physiotherapy Ethics: Morals and ethics; Ethical Issue in physical therapy; Rules and regulation of council; Physical Therapy & Law; Medico-legal aspect of physical therapy; Liability; Negligence and practice licensure workmen compensation; Proper maintenance of Patient's record.

UNIT II **11 Hours**

Physiotherapy Department Management: Recruitment, Interview, probation, salary, hours of working, leaves facilities, retirement, referred policy; Maintenance of records: equipments, statistics; Planning, design construction, expansion plan; Physiotherapy Education Technology; Aims, philosophy and trends and issues; Educational aims; Agencies of education; Formal and informal education; Major philosophies of education (Naturalism, idealism, professionalism, realism)

UNIT III **12 Hours**

Concepts of Teaching and Learning: Theories of Teaching; Relationship between teaching and learning; Psychology of education; Dynamics of behavior, motivational process of learning perception, individual differences, intelligence personality.
Curriculum: Curriculum committee; Development of a curriculum for physiotherapy; Types of Curriculum; Placing, courses placement, time allotment; Correlation of therapy and practice.
Hospital and community areas for clinical instructions.

UNIT IV **11 Hours**

Principles and methods of teaching: Strategies of teaching; Planning of teaching; Organization, writing lesson plan.
AV. aids.
Teaching methods - socialized methods: Measurement and evaluation; Nature of measurement of Educations, meaning, process, personnel; Standardized, non-standardized; Standardized tools, important tests of intelligence, aptitude, instrument; Personality, achievements and status scale.
Programme evaluation; Cumulative evaluation.
Guidance and counselling: Student Ragging and Issues related.
Philosophy, principles and concepts, guidance and counseling services.

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Learning and Teaching-Mangal S.K., 2017*
- *Primary Huh Curriculum Conversations with Subject Leaders in Primary Schools-John Tomsett, 2022*
- *Audio-Visual Aids to Educational Technology-Harmesh Lal, Shailendra Bhushan and Meenu Kumar, 2018*
- *Ethics in Physical Therapy- Nancy Kirsch, 2018*

Web Sources

- *https://www.andrews.edu/chhs/pt/pt/postpro-chhs/student-resources-files/dpt-associated-faculty-resources/pt-policy-manual.pdf*
- *https://www.physio-pedia.com/Ethics*
- *https://www.tes.com/magazine/archive/pedagogy-focus-teaching-theories*
- *https://www.brainkart.com/article/Audiovisual-Aids_35533/*

Course Title: CLINICAL BIOMECHANICS LAB
Course Code: MPM205

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Advocate the role of understanding applied mechanics as an essential skill for Physiotherapist.
2. Evaluate and apply the applications of movement dysfunction into therapeutic exercise prescription.
3. Analyze and prevent secondary impairments and/or pathologies across systems.
4. Analyze the root cause of biomechanical impairments and activity limitations.

Course Content

Forces
Equilibrium
Levers
Gravity, balance & equilibrium
Length-Tension Relationship in Muscle Tissue
Types of Muscle Contraction affecting force production
Angle of Pull
Kinetic Chains
End Feel
Types of Arthrokinematic Motion
Convex-Concave Law
Joint Surface Positions (Joint Congruency)

Transaction Mode

Demonstration method, Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Sahrmann, S. (2001). Diagnosis and treatment of movement impairment syndromes. Elsevier Health Sciences. 2 nd Edition*
- *Magee, D. J. (2013). Orthopedic physical assessment. Elsevier Health Sciences. 3rd Edition*
- *Carol A. Oatis, Kinesiology: The Mechanics and Pathomechanics of Human Movement, 4th Edition*

Web Sources

- *https://www.physio-pedia.com/Introduction_to_Human_Biomechanics_-_External_Forces*
- *https://www.physio-pedia.com/Kinetic_Chain*
- *https://exrx.net/Kinesiology/AnglePull*
- *https://www.physio-pedia.com/Arthrokinematics*

IQAC

Course Title: ELECTRODIAGNOSIS LAB

Course Code: MPM206

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Interpret the E.M.G. and nerve conduction studies with appropriate clinical reasoning.
2. Acquire the sound Knowledge of E.M.G. machine for the simple electro diagnosis of motor unit.
3. Develop the skill of using various Frequency Electrical currents for the purpose of Electrodiagnosis able to interpret the same with appropriate clinical reasoning and apply on the patients.
4. Train the undergraduate students at Pre clinical and clinical level.

Course Content

Characteristics and components of electrotherapeutic stimulation systems.
EMG – normal and abnormal, application of NCV (sensory/motor).
F wave and H Reflex.
High Frequency Currents.
Medium Frequency Currents.
Reflex –classification and properties

Transaction Mode

Demonstration method, Case based teaching, Video based teaching, Group Discussion.

Suggested readings

- *Clinical Electrophysiology - Robinson*
- *Electrotherapy Explain – Low & Read*
- *Electrotherapy – Sheila Kitchen*

Web Sources

- *https://www.physio-pedia.com/Electromyogram*
- *https://www.healthline.com/health/nerve-conduction-velocity*
- *https://www.physio-pedia.com/Reflexes*
- *https://vitalonga.am/en/high-intensity-therapy/*

IQAC

Course Title: ADVANCED MANIPULATIVE SKILLS LAB

Course Code: MPM207

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Acquire the knowledge and skill of various approaches of Manual therapy for joints of the limbs/spine.
2. Apply the manual therapies to rehabilitate the Musculoskeletal problems.
3. Impart knowledge and train the undergraduate in Manual therapy.
4. Synthesize the various techniques for rehabilitation.

Course Content

Overview of manual therapy approaches for all the joints.
Assessment & methods of application of – Maitland, Kaltenborn, Cyriax Concept, Mulligan Concept, McKenzie, Butler's Neural Mobilisation.
Assessment & methods of application of soft tissue approaches – Myofascial techniques, Neural tissue Mobilization, Muscle Energy Techniques.
Assessment & methods of application of High velocity thrust techniques. Positional Release Techniques, Trigger point release, Lymphatic Manipulation**.**
Assessment & methods of application of Kinesiotaping**.**

Transaction mode

Group discussion, Video based teaching, open learning, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning

Suggested readings

- *Manual Therapy Masterclass – Karem S Beeton*
- *Clinical Manual Therapy & Practice – Leon Chaitow*
- *Maitlands Peripheral Manipulation – Elly Hengeveled*
- *Manual of Combined Movement - Edwards*
- *Manual Therapy in Children – Heiner*

Web Sources

- *https://manualmobilization.wordpress.com/kaltenbornconcept/*
- *https://www.physio-pedia.com/McKenzie_Method*
- *https://cyriaxphysio.com/wp/the-cyriax-method/*
- *https://www.physio.co.uk/treatments/physiotherapy/manual-therapy/maitland-concept.php*

IQAC

Course Title: ADVANCED FUNCTIONAL AND PHYSICAL DIAGNOIS
Course Code: MPM208

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning outcomes

After the completion of this course learners will be able to:

1. Focus on the basic assessment skills for physical and Functional diagnosis in Musculoskeletal System in order to study the various impairments and their impact on activity and participation of the individual.
2. Acquire knowledge about the use of appropriate tools or instruments of assessment for diagnosis in various diseases and disorders including musculoskeletal conditions.
3. Comprehend the use of diagnosis for physiotherapy practice.
4. Acquire skill in applied aspect of the subject for physiotherapy practice.

Course Content

UNIT I **11 Hours**

Physical Diagnosis and its importance in clinical practice; Functional Diagnosis and its importance in clinical practice; Subjective examination: Name, age, sex, height, weight, BMI, address, occupation, chief complaint, present history, past history, personal history, history of hospitalization, medical and surgical history; Assessment of Pain: Types of pain: Somatic, referred, Neurogenic, Visceral, etc. Location, duration, progressive or non-progressive, localize or generalize, distribution, quality, Severity, nature of pain; Measurement and Documentation: Visual Analogue Scale (VAS), Numerical Rating Scale (N.R.S.) McGill's modified questionnaire (including Body charts).

UNIT II **11 Hours**

Objective examination: Vitals parameter - Pulse Rate, Respiratory Rate, Blood Pressure, Temperature; Palpation; Tenderness, swelling/oedema, spasm, Surface Contour; Auscultation; Breath sounds, Heart sounds; Measurement: Joint PJROM,

AJROM – Goniometry; Joint End feel, capsular pattern and non-capsular pattern, joint play movements.

UNIT III **12 Hours**

Sensory examination: Superficial, deep and cortical sensation examination; Dermatome Examination; Motor Examination Muscles Tone: Normal, hypotonic and hypertonic; Muscle Girth, wasting – Atrophy and Hypertrophy; Myotome Examination; Reflex: Deep and superficial reflex; Muscle Power: Muscle grading / manual muscle testing (MMT) of Head, Neck, Face, Upper Limb, Trunk and Lower Limb muscles. Introduction, Principles, Uses, Precaution and Contraindication, Types of muscle grading.

UNIT IV **11 Hours**

Gait Measurement: Normal and abnormal gait, Gait parameters assessment procedures Gait Evaluation and demonstrate Pathologic gait examination; Description of some of the most commonly used types of observational gait analysis; Advantages and disadvantages; Balance tests; Romberg test; Hall pike test; Functional reach test etc.; Coordination tests (Equilibrium and non-equilibrium tests); Coordination Tests in Standing, Walking, Sitting or Supine, Finger to nose, Finger to therapist finger, Finger to finger, Alternate nose to finger, Finger opposition, Pronation /Supination, Alternate heel to knee, Drawing an imaginary circle on air with UE and LE, etc.; Functional Diagnosis; Functional Activity Specific Assessment – FIM, ADLs scales Assessment of health and wellness; 36 – SF health questionnaire; Questioners for quality of life and quality of care.

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Orthopedic Physical Assessment, Magee DJ. 5th edition. Saunders*

- *Muscles: Testing and Function, with Posture and Pain: 5th edition. Kendall FP; McCreary EKet al. Lippincott Williams and Wilkins*
- *Practical Exercise Therapy: 3rd edition. Hollis M; Cook PF. Wiley-Blackwell*
- *Training in the Community for the people with disabilities. Goerdt et al. World HealthOrganization*
- *Hand Rehabilitation- A practical Guide. 2nd edition. Clark GL. Churchill Livingstone*
- *Physiotherapy for Respiratory and Cardiac Problems. Adults and Paediatrics. 3rd ed. PryorJA, Webber BA. London: Churchill Livingstone, 2002.*

Web Sources

- *https://musculoskeletalkey.com/neurophysiology-of-the-joints-and-muscles/*
- *https://www.physio-pedia.com/Trigger_Points*
- *https://www.physio-pedia.com/Manual_Lymphatic_Drainage*
- *https://www.spinehealth.com/treatment/chiropractic/spinalmanipulation-high-velocity-low-amplitude-hvla*

IQAC

Course Title: ADVANCED MANIPULATIVE SKILLS
Course Code: MPM209

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning outcomes

After the completion of this course learners will be able to:

1. Acquire the knowledge and skill of various approaches of Manual therapy for joints of the limbs/spine.
2. Integrate the manual therapies to rehabilitate the Musculoskeletal problems.
3. Impart knowledge and train the undergraduate in Manual therapy.
4. Disclose the various techniques for rehabilitation.

Course Content

UNIT I **11 Hours**

Physiological movements; Articular Neuro Physiology and principles of applications.

UNIT II **11 Hours**

Terminology, Principles, indications, contraindications, assessment & methods of application of –Maitland, Kaltenborn, Cyriax, Mulligan, McKenzie, Butler's Neural Mobilisation.

UNIT III **12 Hours**

Terminology, Principles, indications, contraindications, assessment & methods of application of soft tissue approaches – Myofascial techniques, Neural tissue Mobilization, Muscle Energy Techniques.

UNIT IV **11 Hours**

High velocity thrust techniques, Positional Release Techniques, Trigger point release, Lymphatic Manipulation; Kinesiotaping.

IQAC

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Manual Therapy Masterclass – Karem S Beeton*
- *Clinical Manual Therapy & Practice – Leon Chaitow*
- *Maitlands Peripheral Manipulation – Elly Hengeveled*
- *Manual of Combined Movement - Edwards*
- *Manual Therapy in Children – Heiner*

Web Sources

- *https://musculoskeletalkey.com/neurophysiology-of-the-joints-and-muscles/*
- *https://www.physio-pedia.com/Trigger_Points*
- *https://www.physio-pedia.com/Manual_Lymphatic_Drainage*
- *https://www.spinehealth.com/treatment/chiropractic/spinalmanipulation-high-velocity-low-amplitude-hvla*

IQAC

SEMESTER III

Course Title: RESEARCH METHODOLOGY
Course Code: MPM301

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes

After the completion of this course learners will be able to:

1. Demonstrate the ability to choose methods appropriate to research aims and objectives.
2. Develop the skills in qualitative and quantitative data analysis and presentation.
3. Develop advanced critical thinking skills.
4. Develop the foundation for research in physiotherapy.

Course Content

UNIT I **16 Hours**

Research: Its concept; Nature, scope, need and Objectives of Research; Research types; Research methodology; Research process – Flow chart, description of various steps; Selection of research problem.

UNIT II **15 Hours**

Research Design: Meaning; Objectives and Strategies of research; Different research designs; Important experimental designs; Methods of Data Collection and Presentation; Types of data collection and classification; Observation method, Interview Method; Collection of data through Questionnaires, Schedules; Data analysis and interpretation, editing, coding, content analysis and tabulation.

UNIT III **14 Hours**

Sampling Methods: Different methods of Sampling; Probability Sampling methods; Random Sampling; Systematic Sampling; Stratified Sampling; Cluster Sampling and Multistage Sampling; Non probability Sampling methods; Sample size.

UNIT IV **13 Hours**

Report writing and Presentation: Types of reports; Report Format – Cover page; Introductory page; Text; Bibliography; Appendices; Typing instructions; Oral Presentation.

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Panneerselvam, R, 'Research Methodology', PHI, New Delhi.*
- *Cooper, D.R., Schindler, P.S., 'Business Research Methods,' Tata McGraw Hill*
- *Gupta S P,' Statistical Methods', Sultan Chand & Sons, Delhi*
- *Ronald E Walpole, 'Probability and Statistics for Engineers and Scientists' (International Edition), Pearson Education.*
- *Geode, Millian J. & Paul K. Hatl, "Methods in Research", McGraw Hills, New Delhi*
- *Kothari C.R., "Research Methodology", New Age Publisher*
- *Nargundkar R, Marketing Research, Tata McGraw Hill, New Delhi, 2002.*
- *Sekran, Uma, "Business Research Method", Miley Education, Singapore*

Web Sources

- *https://www.academia.edu/*
- *https://www.studeersnel.nl*
- *https://www.scribd.com*

Course Title: RESEARCH PROPOSAL
Course Code: MPM302

L	T	P	Credits
4	0	0	4

Total Hours: 60

Learning outcomes

After the completion of this course learners will be able to:

1. Identify and create the key components of a research proposal.
2. Demonstrate the ability to conduct literature reviews and gather the critical scientific information related to the research proposal.
3. Demonstrate writing skills by writing, a clear, concise research proposal with scientifically defensible aims, methods and conclusions.
4. Develop the skills to objectively review and write a scientific critique of a colleague's proposal.

Course Content

UNIT I **16 Hours**

Literature Review Draft: Students will be expected to create an in-depth literature review organized around a topic(s) relevant to the field of Physiotherapy. The literature review will conclude with research question(s) that are designed to address a gap in the educational literature. This assignment will be graded on APA format, overall writing quality, and alignment among the literature review and research questions, the testability of the research question(s).

UNIT II **15 Hours**

Methodology Draft: Students will be expected to identify a research strategy and method(s) of data collection that will allow them to address their research question effectively. This assignment will be graded on APA format, overall writing quality, and the appropriateness of the research strategy and data collection method(s).

UNIT III **14 Hours**

Final proposal: The final assessment for this course will be the completed draft of a high-quality educational research proposal. The final proposal must include an in-depth review of the literature related to an educational topic, research questions, study design, methods of data collection to be used, and analysis procedures.

UNIT IV **13 Hours**

CITI Training: Researchers must demonstrate their understanding of ethical research procedures prior to working with human subjects. As such, all institutional review boards require that principal investigator complete CITI training. You will be asked to complete CITI training as a component of this course to ensure that you have necessary skills and credential needed to conduct high-quality educational research.

Transaction Mode

Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Liddle, S. D., Baxter, G. D., &Gracey, J. H. (2009). Physiotherapists' use of advice and exercise for the management of chronic low back pain: a national survey. Manual therapy, 14(2), 189-196.*
- *Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.*
- *Alexander, P., Chang, C. M., Yang, C. H., Alkhateeb, H. M., & Oaks, J. A. (2005). Publications by University of Indianapolis Faculty and Staff. Historia Mathematica, 32, 400-425.*

Web Sources

- *https://www.academia.edu/*
- *https://www.studeersnel.nl*
- *https://www.scribd.com*

Course Title: ETHICS AND IPR
Course Code: MPM303

L	T	P	Credits
2	0	0	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Analyze research related information and research ethics.
2. Comprehend and differentiate different types of intellectual properties.
3. Application of ethical principles and commit to professional ethics and responsibilities and norms of physiotherapy research and practice.
4. Acquire knowledge about trademark.

Course Content

UNIT I **15 Hours**

Ethics: definition, moral philosophy, nature of moral judgements and reactions, scope, Ethics with respect to science and research, Intellectual honesty and research integrity Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) Redundant publications: duplicate and overlapping publications, salami slicing, Selective reporting and misrepresentation of data, Publication ethics: definition, introduction and importance

UNIT II **15 Hours**

Introduction to Intellectual Property rights: Concept & theories, Kinds of intellectual Property Rights, Advantages & Disadvantages of IPR, Development of IPR in India, Role & Liabilities of IPRs in India. Rights of trademark-kind of signs used as trademark-types, purpose & functions of a trademark, trademark protection, trademark registration, selecting and evaluating trade mark, trade mark registration process.

Transaction mode

Flipped teaching, Open learning, Group discussion**,** Video based teaching, Case based teaching, Team teaching Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Course Title: PROFICIENCY IN TEACHING

Course Code: MPM304

L	T	P	Credits
2	0	0	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Design the learner-centered instructional plans and learning outcomes.
2. Illustrate innovative teaching strategies and technologies to engage learners.
3. Classify the different assessment methods to evaluate student learning.
4. Reflect on teaching experiences and continuously improve teaching practices.
5. Develop effective communication and classroom management skills.

Course Content

UNIT I **10 Hours**

Overview of the course and its objectives - Theories of learning and their implications for teaching - Understanding the role of the teacher and student in the learning process - Writing clear and measurable learning outcomes – Meaning Nature, definition, scope, and importance Pedagogy, Andragogy, and Heutagogy – Skills-based approach to teaching (Teaching skills), Micro-teaching, Macro teaching. Methods and approaches of teaching - CAM, Structure-function approach, Synthetic and Analytic approach, Jurisprudential inquiry model

UNIT II **6 Hours**

Understanding the diverse needs and backgrounds of learners - Creating an inclusive and supportive learning environment - Facilitating active learning and student engagement strategies; Lectures, discussions, and demonstrations - Group work, collaborative learning, and cooperative learning - Problem-based learning, case studies, and simulations

UNIT III **7 Hours**

Integrating technology tools into instruction – Online, blended learning, flipped learning, and M-learning approaches - Using educational software and platforms effectively; Formative and summative assessment methods – Difference between Assessment, Evaluation and Measurement, E-assessment tools,

UNIT IV **7 Hours**

The importance of reflective practice in teaching - Self-assessment and evaluation of teaching effectiveness – Need for Professional development - Teaching in multicultural and international classrooms - Culturally responsive teaching practices; Meaning, Definition of teaching model - Assumptions, Importance, Role, and type of teaching models. Historical teaching model, Philosophical model of teaching

Transaction Mode

Discussions, Case Studies, Microteaching, Classroom Observations, Peer Teaching: Video Analysis, Role-Playing, Lecture-cum-demonstration, Classroom Simulations, Reflective Journals/Blogs, Teaching Portfolios and Technology Integration, Flipped Teaching.

Suggested Readings

- *Ali, L. (2012). Teacher education. New Delhi: APH Publishing Corporation.*
- *Anandan, K. (2010). Instructional technology in teacher education. New Delhi: APH Publishing Corporation.*
- *Bruce R Joyce and Marsha Weil, Models of Teaching, Prentice Hall of India Pvt Ltd, 1985.*
- *Chalan, K. S. (2007). Introduction to educational planning and management. New Delhi: Anmol Publications Pvt. Ltd.*
- *Chand, T. (2008). Principles of teaching. New Delhi: Anmol Publications Pvt. Ltd.*
- *Chiniwar, P. S. (2014). The technology of teaching. New Delhi: Anmol Publications Pvt. Ltd.*
- *Curzon, L. B., & Tummons, J. (2004). Teaching in future education. U.S.A: Bloomsbury Academic Publications.*
- *Das, R.C. (1993): Educational Technology – A Basic Text, Sterling Publishers Pvt. Ltd.*
- *Evaut, M. The International Encyclopedia of Educational Technology.*
- *Gage N L, Handbook of Research on Teaching, Rand Mc Nally and Co., Chicago, 1968.*
- *Graeme, K. (1969): Blackboard to Computers: A Guide to Educational Aids, London, Ward Lock.*
- *Haas, K.B. and Packer, H.Q. (1990): Preparation and Use of Audio Visual Aids, 3rd Edition, Prentice Hall, Inc.*

- *Haseen Taj (2006): modern Educational Technology, Agra: H.P Bhargava Book House.*
- *Jarvis, M. (2015). Brilliant ideas for ICT in the classroom. New York: Routledge Publications.*
- *Kumar, K.L. (2008): Educational Technology, New Age International Pvt. Ltd. Publishers, New Delhi (Second Revised Edition).*
- *Kumar, P. (2015). Web-based technology in education. New Delhi: APH Publishing Corporation.*
- *Mangal, S. K. (2014). Advanced educational psychology. New Delhi: PHI Learning Pvt. Ltd.*
- *Mohan, R. (2011). Teacher education. New Delhi: PHI Learning Pvt. Ltd.*
- *Mukhopadhyay, M. (1990): Educational Technology – Year Book 1988, All India Association for Educational Technology, New Delhi.*
- *Murty, K. (2015). Educational technology. New Delhi: APH Publishing Corporation.*
- *Popham, W. J. (2014). Classroom assessment. U.S.A: Pearson Publications.*
- *Purayil, A. V. (2015). Educational technology. New Delhi: APH Publishing Corporation.*
- *Ranford, C. P. (2013). Strategies for successful student teaching. New Jersey: Pearson Publications.*
- *Schrum, L., & Levin, B. B. (2015). Leading 21st Century School. U.S.A.: Sage Publications.*
- *Sharma R A, Technology of Teaching, International Publishing House, Meerut, 1988.*
- *Sharma, R. N., & Chandra. S. S. (2007). Advanced educational technology. New Delhi: Atlantic Publications.*
- *Siddiqui M S., and Khan M S., Models of Teaching – Theory and Research, Manas Publication, New Delhi, 1991*
- *Singh, & et. al. (2014). Educational technology: teaching-learning. New Delhi: APH Publishing Corporation.*

Web Sources

- *wiki.eveuniversity.org*
- *www.adprima.com*
- *www.apa.org*
- *www.crlt.umich.edu*
- *www.edutopia.org*
- *www.eveuniversity.org*
- *www.facultyfocus.com*
- *www.reddit.com*
- *www.theteachersguide.com*

Course Title: COMPUTER LAB
Course Code: MPM305

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:

1. Design charts and graphs in Microsoft Excel.
2. Acquire knowledge about scientific editing tools.
3. Analyse various features of Microsoft Word, Excel and Power Point Presentation.
4. Acquire skills in mail merge tools.

Course Content

Generating Charts/Graphs in Microsoft Excel
Power Point Presentation, Creating a new document with templates & Wizard
Word basics
Thesis Writing Formats
Scientific editing tools
Style Formats (MLA & APA)
Using Words Drawing Features, Inserting Tables – (Adding, deleting, modifying rows and columns - merging & splitting cells), Using formulas in tables, Converting text to table and vice-versa.
Mail Merge tool
Managing Workbooks, Working with Worksheets

Transaction Mode

Demonstration method, Lecture, Seminar, e-Team Teaching, e-Tutoring, Dialogue, Peer Group Discussion, Mobile Teaching, Self-Learning, Collaborative Learning and Cooperative Learning.

Suggested Readings

- *Leon & Leon, "Introduction to Computers", Vikas Publishing House, New Delhi*
- *Saxena S., "MS Office Xp for Everyone", Vikas Publishing House, New Delhi, 2007*
- *June Jamrich Parsons, "Computer Concepts", Thomson Learning, 7th Edition, Bombay*
- *White, "Data Communications & Computer Network", Thomson Learning, Bombay*

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- *Comer, "Computer networks and Internet", Pearson Education, 4e*

Web Sources

- *https://www.researchgate.net*
- *https://www.youtube.com/playlist?list=PLWPirh4EWFpF_2T13UeEgZWZHc8nHBuXp*

IQAC

Course Title: SERVICE LEARNING
Course Code: MPM306

L	T	P	Credits
0	0	4	2

Total Hours: 30

Learning outcomes

After the completion of this course learners will be able to:
1. Evaluate the definition of Service Learning.
2. Analyze the engaged teaching and engaged research.
3. Acquire greater levels of civic behavior and social responsibility.
4. Synthesize a greater commitment to a service-oriented career.

Course Content

Service Learning: Principles; Classification; Models; Difference between service learning and other community experiences; Service Learning for a Postgraduate Physiotherapy Student and its scope in Research; Conceptualization of the Idea of Service Learning; Conducting awareness programs on Role of Physiotherapy for nearby communities; Organizing demonstrations of Physiotherapy Practices for school children to pursue higher studies in Physiotherapy; Surveying the needs of community and discover solutions for the same; Providing Consultancy to school students to enhance awareness about Physiotherapy.

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