Faculty of Medical, Paramedical & Allied Health Sciences

Syllabus

For

Master of Physiotherapy

(M.P.T)

(Program Code: HS0151)

(2019-20)

(Approved by the Academic Council vide Resolution No. 34.26 dated 20.06.2019)

INDEX

1. Program Educational Objectives (PEOs)

After successful completion of the program, the graduates will be

PEO1: Able to pursue a successful career in the field of physiotherapy and broaden the horizon of physiotherapy in specialized fields.

PEO2: Able to develop ability to evolve clinical reasoning and professional expertise to meet desired healthcare needs of patients and society.

PEO3: Able to practice in a consistent manner with established legal standards, professional behavior and ethical guidelines as an individual as well as multidisciplinary team.

2. Post- Graduate Attributes (PGAs)

The Post-graduate attributes in MPT are the summation of the expected course learning outcomes mentioned in the end of each course. Some of them are stated below. These learning goals for MPT are divided into nine key areas:-

PGA1: **ROLE OF PHYSIOTHERAPY**-Recognize the role of Physiotherapy in the context of the health needs of the community and National priorities in the health sector.

PGA2: **ACQUISITION OF KNOWLEDGE** -To acquire knowledge and skills in various fields like, Exercise testing physiology, Movement analysis, Electro diagnosis, Physiotherapy Diagnosis etc.

PGA3: **EVIDENCE BASED PRACTICE**-Using an Evidence Based analysis to interpret assessment findings and to apply general principles of Practice in order to set realistic short and long term goals and undertake discharge plan.

PGA4: **RESEARCH PROCESS**- To appreciate the importance of clinical epidemiology, research ethics and advance in computer applications and formulate research process in physiotherapy.

PGA5: **ADVANCED LEARNING**-Experiment with new approaches, challenges, existing knowledge, boundaries and design novel solution to various critical problems through logical, analytical and critical thinking.

PGA6: **TEACHING** - Able to teach Physiotherapy with appropriate teaching methodology.

PGA7: **ETHICS-** Demonstrate professional and ethical behavior appropriate to at least the minimum standard expected for a Physiotherapy Post Graduate.

PGA8: **RECENT TRENDS**- Able to practice recent trends in investigative methods and intervention modalities in the field of physiotherapy.

3. Programme Outcomes (POs)

Students Post- graduating with the MPT degree should be able to acquire-

PO1: Capability of demonstrating comprehensive knowledge of physiotherapy in health sector.

PO2: Ability to utilize the knowledge gained and apply them in various problems.

PO3: Ability to acquire critical thinking in understanding the goals.

PO4: Capability to solve problems by using research-based knowledge and research methods and can set short term and long term goals for rehabilitation.

PO5: Possess knowledge of the values and beliefs of multiple cultures and a global perspective and capability to effectively engage in a multicultural society and interact respectfully with diverse groups. Define and apply appropriate techniques and resources.

PO6: Ability to teach students and choose a suitable teaching methodology.

PO7: Ability to identify unethical behavior and adopting objective, unbiased and truthful actions in all aspects of their programme.

PO8: Develop a sense of utilizing recent trends to investigate and practice conditions.

Mapping of Post Graduate Attributes (PGAs) and Programme Outcomes (POs):

	PGA1	PGA2	PGA3	PGA4	PGA5	PGA6	PGA7	PGA8
PO1	■							
PO2		■						
PO3			■					
PO4				■				
PO5					■			
PO6						■		
PO7							■	
PO8								■

4. Program Specific Outcomes (PSOs):

MPT (NEUROLOGY)

PSO1: Demonstrate sufficient understanding of knowledge in the subject of neurological physiotherapy.

PSO2: Develop ability to take history from the patient, perform relevant clinical examination, decide appropriate management plan with advanced techniques used in neurological patients and also by analyzing data and publishing researches.

MPT(MUSCULO-SKELETAL)

PSO1: To acquaint himself / herself with the past and current literature on relevant aspects of orthopedic Physiotherapy.

PSO2: To assess, plan and interpret various musculoskeletal conditions and plan relevant advanced therapeutic methods and also by analyzing data and publishing researches.

MPT(SPORTS)

PSO1: Demonstrate sufficient understanding of knowledge in sports physiotherapy.

PSO2: Develop ability to take history from the patient, perform relevant on field examination and plan the physiotherapy management for the benefit of the sportspersons and also by analyzing data and publishing researches.

5. Course-Wise Learning Objectives, Structures and Outcomes (CLOSOs)

Course learning outcomes of each course in MPT have been enshrined in the end of course contents of each course with their objectives those are in the beginning of the every course.

MPT 1ST Year
Course Structure

			THEORY			PRACTICAL					
Code No.	Paper	Type	Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks	L	T/P	Credits
MPT101	Basic Medical Sciences	CORE	100	30	70				4x2=8	-	8
MPT102(A)	Biomechanics	ELECTIVE	100	30	70				4x2=8	-	8
MPT 102(B)	Laser	ELECTIVE	100	30	70				4 X 2=8	-	8
MPT 103	Physiotherapy methods-I & Physiotherapy Methods –II	CORE	100	30	70				4x2=8	-	8
MPT 104	Research Methodology & Biostatics	CORE	100	30	70				4x2=8	-	8
MPT 105	Basics of Exercise Physiology & Nutrition	CORE	100	30	70				4x2=8	-	8
SPECILIZATION											
MPT 106A	Assessment and Evaluation in Neuro-physiotherapy & Physiotherapy in Pediatric Neurology	CORE ELLECTIVE	100	30	70	100	30	70	4x2=8	3x2=6	14
MPT106B	Assessment and Evaluation in Musculoskeletal Physiotherapy & Physiotherapy In Non-Traumatic Orthopaedic Conditions	CORE ELLECTIVE	100	30	70	100	30	70	4x2=8	3x2=6	14

MPT106C	Sports Traumatology1 & Sports Traumatology 2	CORE ELECTIVE	100	30	70	100	30	70	4x2=8	3x2=6	14
	TOTAL										**54**

MPT 2ND YEAR

			THEORY			PRACTICAL					
Code No.	**Paper**	**Type**	**Total Marks**	**Internal Marks**	**External Marks**	**Total Marks**	**Internal Marks**	**External Marks**	**L**	**T/P**	**Credits**
MPT 201	Bio-Engineering and Rehabilitation Principles	CORE	100	30	70	-	-		4x2=8	-	8
MPT 202(A)	Applied Exercise Physiology	ELECTIVE	100	30	70	-	-		4x2=8	-	8
MPT 202(B)	Disaster management	ELECTIVE	100	30	70	-	-		4 X 2 = 8	-	8
Specialization in Neuro Physiotherapy											
MPT 203A	Physiotherapy & Rehabilitation in Neurological Disorders -1	Elective CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
MPT 204A	Physiotherapy & Rehabilitation in Neurological Disorders -II	Elective CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
MPT 205A	Current Concept in Neuro- Physiotherapy	Elective CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
Specialization in Ortho Physiotherapy											
MPT 203B	Physiotherapy In Traumatic Orthopedic Conditions	CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
MPT 204B	Physiotherapy In Vertebral Disorders	CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
MPT 205B	Current Concepts in Ortho Physiotherapy	CORE	100	30	70	100	30	70	4x2=8	3x2=6	11
Specialization in Sports Physiotherapy											

MPT 203C	Non-Traumatic Medical Conditions of athletes	**CORE**	**100**	**30**	**70**	**100**	**30**	**70**	**4x2=8**	**3x2=6**	**11**
MPT 204C	Sports Psychology	**CORE**	**100**	**30**	**70**	**100**	**30**	**70**	**4x2=8**	**3x2=6**	**11**
MPT 205C	Current concept of Sports Medicine Physiotherapy	**CORE**	**100**	**30**	**70**	**100**	**30**	**70**	**4x2=8**	**3x2=6**	**11**
MPT 206	MAJOR PROJECT CUM DISSERTATION	**CORE**	-	-	-	100	30	70	**4x2=8**		8
TOTAL											**57**

Note: Credits are allotted based upon individual specialization and compulsory subjects with dissertation

Note: Yearly credits have been calculated by multiplying the semester-wise teaching hours by two.

A student is required to obtain min. 50% marks in individual paper to pass

Maximum & minimum credits of the program
The total number of the credits of the MPT Programmes is 111

Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student should secure all 111 credits.

MPT 1ST YEAR

BASIC MEDICAL SCIENCES

MPT101

COURSE OBJECTIVES-

- Understanding of gross anatomy of various body parts with their respective physiology.
- Application of knowledge of anatomy to learn evaluation and application of physical therapy.
- Major emphasis of learning is towards Musculoskeletal, cardio-respiratory and Nervous system.

UNIT 1- A reviews of organization and regulation of motor system.

Types of movement and factors affecting contact and range of motion at synovial joints

Skeletal muscle tissue

Muscle metabolism

Contraction and relaxation of muscle

Control of muscle tension

UNIT 2- A review of control system of body (Motor and sensory).

Structure function and organization of nervous tissue

Electrical signals in neurons and its transmission

Regeneration and repair of nervous tissue

Functional organization of cerebral cortex

Sensory motor and integrative system (Sensation, somatic sensation, Sensory pathways, motor pathways).

Reflexes and reflex arcs

UNIT 3-Structure and function of cardio vascular system & respiratory system along with their disorders.

UNIT 4-Structure and function of endocrinal system & disorders.

UNIT 5-Structure and function of Musculoskeletal System & disorders

Books Suggested :

1. Gray's Anatomy - Williams & Warwick - Churchill Livingstone.
2. Grants – Methods of Anatomy - Basmajian&Sloncker - Williams & Wilkins.
3. Clinical Anatomy for Medical Students - Snells – Lippincott.
4. Textbook of Medical Physiology - Guyton - Mosby.
5. Pathologic Basis of Diseases - Robbins, Kotran and Kumar – W.B. Saunders.

COURSE OUTCOMES: After the end of the course, the students will be able to

CO1-Appreciate the team approaches to learning in complex areas (Bloom's level L-2)

CO2- Critically evaluate research literature in the area of anatomy and physiology and apply this information towards understanding the mechanisms operating in musculoskeletal conditions resulting from injury or disease(Bloom's level -L5)

CO3- Appreciate the importance and development of good written and presentation skills to aid group learning.(Bloom's level-L2)

CO4- Relate pathological findings or changes in various conditions.(Bloom's level-L4)

CO5-Use critical thinking and scientific problem-solving skills, to make decisions.(Bloom's Level-L5)

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	L	H	M	M	H	M	L	L	-	-
CO2	L5	H	M	H	H	M	H	L	H	-	-
CO3	L2	M	H	L	H	H	H	L	M	-	-
CO4	L4	M	L	-	L	H	M	-	M	-	-
CO5	L5	H	H	H	H	H	M	L	L	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

Biomechanics
MPT102(A)

COURSE OBJECTIVES:

- To understand the basic principles of biomechanics related to human body and applying it with exercise therapy.
- To understand the structure and function of joints.
- To understand the normal gait and posture.

UNIT1 – Concepts of Biomechanics:

Introduction to Kinesiology and Biomechanics.
Principle of Biomechanics
Nature and importance of Biomechanics in Physiotherapy.
Advanced Biomechanics and kinesiology
Introduction to biomechanical analysis of humane motion.
Analytical tools and techniques –
Isokinetic Dynamometer,
Kinesiological EMG,
Electronic Goniometer,
Force Platform,
Videography.
Ergonomic approach to lifting and handling, workspace and environment.
Patient positioning, body mechanics and Transfer techniques.

UNIT 2- Upper Extremity: Shoulder and Shoulder girdle, Elbow joint, Wrist joint and Hand.

UNIT 3- Lower Extremity: Pelvic Girdle, Hip joint, Knee joint, Ankle & Foot.

UNIT 4- Spine

UNIT 5-Gait-Gait Analysis: Kinetic & Kinematic Analysis.
Pathological Gait: Kinetic & Kinematic Analysis

Books Suggested:

1. James G. Hay – The Biomechanics of Sports Techniques, Prentice Hall.
2. Brunnstrom - Clinical Kinesiology, F.A. Davis.
3. Luttgens K., Hamilton N.: Kinesiology – Scientific Basis of Human Motion 9th Edi,1997 Brown & Benchmark.
4. Kreighbaum E., Barthels K.: Biomechanics – A Qualitative approach for studyingHuman Motion, 2nd edi. 1985, MacMillan.

5. Rasch and Burk: Kinesiology and Applied Anatomy, Lee and Fabiger.
6. White and Punjabi - Biomechanics of Spine - Lippincott.
7. Norkin&Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A.Davis.
8. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders.
9. Northrip et al: Analysis of Sports Motion: Anatomic and Biomechanics perspectives,W.C. Brown Co., IOWA.
10. Leveac B.F.: Basic Biomechanics in Sports and Orthopedic Therapy, C.V. Mosby.
11. De Boer & Groot: Biomechanics of Sports, CRL Press, Florida.
12. Basmajian - Muscle alive - Williams & Wilkins.
13. Nordin& Frankel - Basic Biomechanics of Muscular Skeletal System - Williams &Wilkins.
14. Bartlet - Introduction to Sports biomechanics - F & FN Spon Madras.

Paper Code: MPT102(B)
LASER

Theory

External Assessment-70
Internal Assessment- 30
Total Marks-100
Pass Marks-50% in each
Time- 3 hrs

UNIT I :INTERFERENCE OF LIGHT

- Review of basic ideas of interference
- Interference due to transmitted light
- Principle of Interference
- Theory of interference-intensity distribution
- Conditions for interference

UNIT II:COHERENCE

- Principles of coherence, types of coherence
- Coherent wave- optical path and phase change
- Scope of coherence
- Spatial coherence in laser
- Difference between collimated and coherent light

UNIT III:**DIFFRACTION**

- Properties of diffraction
- Effects of diffraction
- Fresnel Diffraction
- Huygens- Fresnel theory, zone plate
- Difference between zone plate and convex lens, comparison between interference and diffraction
- Diffraction pattern due to a straight edge
- Diffraction pattern due to a single silt

UNIT IV:

- explain the function of techniques for characterising ultra-short laser pulses, e.g. autocorrelation, SPIDER, and FROG
- systematically describe the construction of, and principles for modern high-power lasers
- demonstrate in-depth understanding of high-harmonic generation and attosecond pulses describe in detail the properties of synchrotrons, and free electron lasers

UNIT V : LASER AND FIBRE OPTICS

- Absorption and emission of light
- Absorption-spontaneous emission and stimulated emission

- Einstein relations
- Population inversion, Active medium
- Three level and Four level Laser systems
- Semiconductor Laser, Laser beam Characteristics
- Applications of Laser, Holography (qualitative study only)

Books for Reference

1. Optics by N.Subramanayam, Brijlal, M.N.Avadhanulu-Chapter 14, 15, 17,18, , and 19

2. Optics by N.Subramanayam, Brijlal, M.N.Avadhanulu-Chapter 20, 22 and 23. 30

COURSE OUTCOMES: **After the end of the course, the students will be able to**

CO1: Understand the relationship between structure and function of the musculoskeletal system of the healthy and diseased subjects.(Bloom's Level -L2)

CO2:Develop ability to analyze mechanisms underlying selected musculoskeletal conditions resulting from injury or disease processes.(Bloom's Level- L3)

CO3:Understand the anatomy / applied anatomy basis for clinical testing of musculoskeletal structures.(Bloom's Level- L2)

CO4: Demonstrate clinical decision making ability and provide appropriate patient care.(Bloom's level-L5)

CO5:Understand the kinetic concepts including inertia, force, torque, impulse and identify the major factors involved in the angular kinematics of human movement.(Bloom's Level-L2)

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**
CO1	**L2**	**M**	**H**	**H**	**H**	**H**	**H**	**L**	**M**	-	-
CO2	**L3**	**H**	**H**	**M**	**M**	**M**	**H**	**L**	**L**	-	-
CO3	**L2**	**L**	**H**	**L**	**H**	**H**	**H**	**L**	**M**	-	-
CO4	**L5**	**M**	**M**	**H**	**H**	**L**	**L**	**L**	**-**	-	-
CO5	**L2**	**H**	**M**	**L**	**-**	**-**	**-**	**M**	**L**	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

Physiotherapy Methods
MPT 103

COURSE OBJECTIVES-

- Acquire the knowledge and skill of various therapeutic exercise .
- Acquire the knowledge and skill of various approaches of Manual therapy for joints of the limbs/spine.
- Able to integrate the manual therapies to rehabilitate the Mechanical Neuro- Muscular problems.
- Able to interpret the E.M.G. and nerve conduction studies with appropriate clinicalreasoning.
- Expertise in the skill of using various electrical currents for the purpose of Electro-diagnosis able tointerpret the same with appropriate clinical reasoning.
- Able to integrate theoretical knowledge with clinical practice **.**

UNIT-I

I. Principle of therapeutic exercises

II. Definition, details of effects and uses of following exercises.

a. Dynamic Exercises

b. Plyometric Exercises

c. Isokinetic Exercises

d. Kinetic chain exercises

e. PRE

III. Stretching

IV. Balance and coordination exercises

V. Factors affecting the joint range of motion prevention of stiffness, methods ofJoint mobilization.

UNIT-II

I. Principles and application of neuromuscular facilitation techniques including PNF

II. Principles of different soft tissue mobilizations like Myofacial Techniques,

III. Neural Tissue Mobilization

IV. Muscle Energy Technique

V. Aquatic therapy

UNIT-III

Massage

I. Historical development.

II. Definition and classification of massage techniques

III. Physiological effects of massage.

IV. Description of the techniques of the classical massage.

V. Physiological basis of massage, underwater massage, mechanical devices ofmassage

VI. Therapeutic applications and contraindications of massage.

UNIT-IV

I. Electro diagnosis: introduction to methods of electro diagnosis SD CURVE

II. Electro myography : technique of EMG, interpretation of normal and abnormal responses

III. Nerve conduction studies: MNCV, SNCV, variables affecting nerve conduction, measurementof NCV of nerves of upper limb and lower limb, interpretations of normal and abnormalresponses.

IV. Evoked potentials, H-reflex, P wave, repetitive nerve stimulation, VEP, BAEP, SSEP.

V. Review of Principles underlying the application of following modalities with reference totheir Production, biophysical and therapeutic effects, indications and contraindications and thespecific uses of:

i. Superficial heating modalities

ii. Deep heating modalities

iii. Ultrasound

iv. Cryotherapy

UNIT-V

I. Review of Principles underlying the application of following modalities with reference to theirProduction, biophysical and therapeutic effects, indications and contraindications and the specificuses of Physiotherapy

II. TENS, IFT, Russian Currents. LASER

III. Advanced Electro Therapeutics in Tissue healing, Wound care, Management of Scarskeloids, Muscle Plasticity & Integumentary Conditions.

IV. BIO-FEED BACK

V. Clinical reasoning and differential clinical diagnosis based on various approaches such asMaitland, Kaltenborne, Cyriax, Mulligan, Meckenzie etc

Books suggested:

1. Werner Kuprian: Physical Therapy for Sports, W.B. Saunders.
2. William E. Prentice: Therapeutic Modalities in Sports Medicine - Mosby.
3. William E. Prentice: Rehabilitation Techniques - Mosby.
4. O' Sullivan, Schmitz: Physical Rehabilitation – Assessment and Treatment - F.A.Davis.
5. John Low & Reed: Electrotherapy Explained, Butterworth.
6. Meryl Roth Gersh: Electrotherapy in Rehabilitation, FA Davis.
7. Joseph Kahn: Principles and Practice of Electrotherapy, Churchill Livingstone.
8. Claytons Electrotherapy 10th Ed. - Sarah & Bazin - W.B. Saunders.
9. Harrelson and Andrews: Physical Rehabilitation of Injured Athlete.
10. Nelson and Currier: Clinical Electrotherapy, Prentice Hall.
11. Greenman: Principles of Manual medicine, William and Wilkins.
12. Kuprian: Physical Therapy for Sports, W.B. Saunders.
13. Bates: Aquatic Exercise Therapy, W.B. Saunders.

14. Michlovitz - Thermal agents in Rehabilitation - F.A. Davis.
15. Lehmann - Therapeutic Heat and Cold - Williams & Wilkins.
16. Sinha A.G.: Principle and Practices of Therapeutic Massage – Jaypee Brothers,New Delhi
17. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A.Davis.
18. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
19. Thomson et al - Tidy's Physiotherapy: Butterworth – Heinmann.
20. Wood & Baker: Beard's Massage, W.B. Saunders.
21. Kendall: Muscles – Testing and Function - Williams & Wilkins
22. Daniels and Worthinghams: Muscle Testing – Techniques of ManualExamination, W.B. Saunders.
23. William E. Prentice: Rehabilitation TechniquesUNIT -1 Physiotherapy methods

COURSE OUTCOMES: **After the completion of course, students will be able to**

CO1: Appreciate the team approach to learning incomplex areas and theneed for intercultural sensitivity and understanding particularly of different learningstyles.(Bloom's Level-L2)

CO2: Appreciate the importance of and developmentof good writtenand verbal communication skills to articulate knowledge in exercise and electrophysiology.(Bloom's level-L2)

CO3: Able toevaluate and synthesize research and professional literature and apply this information to novelsituations.(Bloom's Level-L5)

Massage and mobilization.(Bloom's Level- L1)

CO5:Explain CO4:Describe the concepts and knowledge of the general Principle of therapeutic exercises, the technique and concept of electric modality use in physiotherapypractice.(Bloom's Level-L2)

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	**PSO1**	**PSO2**
CO1	**L2**	**L**	**H**	**H**	**M**	**L**	**M**	**L**	**L**	-	-
CO2	**L2**	**H**	**M**	**H**	**H**	**M**	**M**	**L**	**M**	-	-
CO3	**L5**	**H**	**H**	**L**	**H**	**H**	**M**	**H**	**H**	-	-
CO4	**L1**	**H**	**L**	**M**	**L**	**-**	**L**	**H**	**L**	-	-
CO5	**L2**	**H**	**M**	**L**	**L**	**-**	**L**	**H**	**L**	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

Research Methodology and Biostatistics
MPT 104

Theory

External Assessment-70

Internal Assessment- 30

Total Marks-100

Course Objective –

- Understand some basic concepts of research and its methodologies.
- Identify appropriate research topics.
- Select and define appropriate research problem and parameters.
- Understand some basic concepts of biostatics, research tools and data analysis.
- Write a research report and thesis.

UNIT-1

I. Research –Introduction, scope, characteristics, types, clinical trials and ethics.
II. Research methods—various methods.
III. Census and survey methods of investigation.
IV. Hypothesis—Advantages and types.
V. Sample - Introduction and types of sampling.
VI. Sample size determination (according to study design)

UNIT-II

Methods of Data Collection

I. Schedule –Introduction, types, procedure of forming schedule and limitations.
II. Questionnaire – Introduction, types, reliability and limitations.
III. Interview -- Introduction, types, technique and limitations.
IV. Observation – Introduction, organization of field observations and limitations.
V. Preparation of report – Introduction, developing outline, writing, references andbibliography.

UNIT-III

I. Biostatistics –Introduction, origin &development, scope, functions and limitations
II. Presentation of data—Classification, tabulation, diagrammatic and graphicalpresentation of data.
III. Central tendencies – Mean, Mode and Median
IV. Measures of dispersion – Standard deviation and standard errors.
V. Skewness and kurtosis.
VI. Odd Ratios, Receiver Operating Curve (ROC)
VII. Probability

UNIT-IV

Statistical Tools-

I. Correlation and regression

II. Parametric tests

III. Non-parametric tests

UNIT-V

Writing Research Reports and Thesis

Books Suggested:

1. Bailey, N.T.J. -Statistical methods in Biology. The English universities press, London
2. Bajpai, S.R.- Methods of Social Survey and Research, Kitab Ghar, Kanpur.
3. Colton - Statistics in medicine, Little Brown Company, Boston
4. Gupta, S.P -Statistical methods. Sultan Chand and Sons Publishers, New Delhi.
5. Goulden C.H.- Methods of Statistical Analysis. Asia Publishing House, New Delhi.
6. Mohsin S.M.- Research Methods in Behavioral Sciences: Orient Publications. New Delhi.
7. Mahajan - Methods in Biostatistics, Jay Pee Brothers.Medical Publishers (P) Ltd. NewDelhi.
8. Hicks- Research for Physiotherapists, Churchill Livingstone, London.
9. Meenakshi. - First Course in Methodology of Research. Kalia Prakashan, Patiala.
10. Kumar, R.- Research Methodology. Pearson Education, Australia.
11. Snedecor,G.W -Statistical Methods, Allied Pacific Pvt. Ltd., London
12. Singh, I.- Elementary Statistics for Medical Workers. Jaypee Brothers Medical Publishers(P) Ltd. New Delhi.

COURSE OUTCOMES- After the completion of course, students will be able to

CO1: Apply the principles of research and biostatistics to health practice including the design and implementation of health related research studies.(Bloom's Level -L3)

CO2: Plan and execute a research study, including clinical trials.(Bloom's Level-L4)

CO3: Use or organize bio-statistical analysis using computers and software and prepare reports or papers and critically evaluate research activities. (Bloom's Level- L4)

CO4: Understand the method of data collection.(Bloom's Level-L2)

CO5: Evaluate and Formulate Research questions.(Bloom's Level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's level	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**
CO1	**L3**	**H**	**H**	**H**	**M**	**H**	**M**	**L**	**H**	-	-
CO2	**L4**	**M**	**H**	**H**	**M**	**H**	**M**	**H**	**M**	-	-
CO3	**L4**	**M**	**H**	**M**	**H**	**M**	**L**	**L**	**M**	-	-
CO4	**L2**	**H**	**L**	**L**	**L**	**-**	**H**	**-**	**L**	-	-
CO5	**L5**	**M**	**M**	**H**	**H**	**L**	**M**	**L**	**M**	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

Paper Code: MPT 105

Basics of Exercise Physiology & Nutrition

COURSE OBJECTIVES:

- Understand the physiology of exercise.
- Understand the role of nutrition in exercises.
- Understand the various energy systems in body.

UNIT 1-Bioenergetics of exercise : High energy phosphates, Anaerobic and aerobic ATP synthesis, Bioenergetics Control, exercise intensity & substrate utilization, protecting CHO stores, muscle adaptation to endurance training, processes that potentially limit the rate of fat oxidation, regulation of substrate utilization, training - induced increase in FFA oxidization, Basal metabolic and resting metabolic rates and factors affecting them, Classification of Physical Activities by energy expenditure,. Concept of MET, measurement of energy cost of exercise

UNIT II- Nutrition

metabolism of Carbohydrate, fats and proteins, vitamin, mineral and wateroptimum nutrition for exercise, nutrition for physical performance, pre game mealcarbohydrate loading, food for various athletic events, fluid and energy replacement in prolonged exercise

UNIT III- (i)Respiratory responses to exercise: Ventilation at Rest and during Exercise., Ventilation and the Anaerobic Threshold, static and dynamic lung volume . Gas diffusion, Oxygen and carbon dioxide transport second wind,stich by side control of pulmonary ventilation during exercise adaptive changes in the respiratory systems due to regular physical activities .

ii) Cardiovascular responses to exercise- Cardiovascular system and exercise, acute vascular effects of exercise, Circulatory responses to various types of exercise regulation of cardiovascular system during exercise, Pattern of redistribution of blood flow during exercise, adaptive responses of cardiovascular system to aerobic and anaerobic training. Athlete heart

UNIT IV- Exercise and Acid Base Balance:

Acid and Bases, Buffers, pH, Respiratory Regulation of pH, Alkali Reserve, The kidneys and Acid base balance, Alkalosis and Acidosis, Acid base balance following heavy exercise.

UNIT V- Hormonal responses to exercise with respect to

Growth Hormone (GH), Thyroid and Parathroid Hormones. Anti diuretic Hormone (ADH) and Aldosterone, Insulin and Glucagons, The catecholamine; epinephrine and nor epinephrine. The sex hormones. The glucocorticoids (Cortisol) and AdrenoCorticotrophic Hormones (ACTH). Prostaglandins and Endorphins.

Books suggested :

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000)·
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill (2000)
3. Exercise Physiology: Powers, SK and Howley ET. 4th edn; Mc Graw Hill (2001)
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company (1996)
6. Komi, P. (Ed.) (1992) Strength and power in sport. Blackwell Scientific Publications.
7. Levick, J.R. (1998) An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann
8. McArdle, WD, Katch, FI &Katch, VL (2001) Exercise Physiology. 5th ed. Lippincott, Williams & Wilkins.
9. Shephard and Astrand (1996) Endurance in sport. Blackwell Scientific Publications.

COURSE OUTCOMES: After the end of the course, the students will be able to

CO1-Acquire sound theoretical knowledge of muscle physiology including muscle structure, mechanical properties, fiber types, neural activation, soreness, damage and adaptation, and the effects of aging, immobile/disuse, training, fatigue and spasticity on muscle.(Bloom's Level-L1)

CO2- Acquire theoretical knowledge of exercise physiology including exercise metabolism, cardio-respiratory response to exercise, energy, nutrition and environmental factors in exercise.(Bloom's Level -L2)

CO3- Critically evaluate and synthesis research and professional literature relating to a chosen topic in the muscle/exercise physiology to analyze and interpret electro diagnostic procedures.(Bloom's Level-L5)

CO4: Understand acid base balance in the body.(Bloom's Level- L2)

CO5:Know the various hormonal responses of the body during exercise.(Bloom's Level-L1)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L1	M	H	H	M	L	M	L	L	-	-
CO2	L2	H	M	H	H	M	M	L	M	-	-
CO3	L5	H	H	L	H	H	M	H	H	-	-
CO4	L2	H	M	L	-	L	H	L	-	-	-
CO5	L1	H	L	L	-	-	H	L	-	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

ASSESSMENT AND EVALUATION IN NEURO-PHYSIOTHERAPY &PHYSIOTHERAPY IN PEDIATRIC NEUROLOGY

Code: MPT 106 A

COURSE OBJECTIVE:

- To understand the assessment and evaluation in neurology.
- To understand the balance, equilibrium and coordination.
- To understand assessment of pediatric conditions.

UNIT 1– Physical Therapy Assessment Procedures Used In Neurological Conditions:

Neurological assessment, evaluation and correlation of findings with neurological dysfunction

History taking and examination of neurologically ill patient

Higher cerebral function examination,

Cognitive and perceptual assessment,

Cranial nerves examination

Motor System Assessment - Tone, voluntary movement control & abnormal involuntary movement,

Assessment of reflex integrity

Assessment of gait (kinetic & kinematic)

Sensory system assessment and examination

Balance and Co-ordination

Assessment evaluation of following and correlation of findings with neurological dysfunction

Balance, equilibrium and Coordination assessment.

Assessment of Autonomic nervous system function.

Vestibular Examination

Assessment of unconscious patient.

UNIT II- Neurological Assessment scales and measurement tools

Functional Assessment scales: Barthel index, Katz Index of ADL, FIM Scale, Sickness Impact Profile, Outcome & Assessment Information Set (OASIS).IADL.

Functional balance and coordination scales: functional reach test, Timed up and go test, Get up and go test, Berg balance Scale, CTSIB, Scales used in ataxia

Rehabilitation Outcome measure scales: Quality of life Measures, Scales used in Assessment of elderly.

UNIT III :Advanced Neurological Assessment Procedures:

Disease Specific Measurements scales and tools: Clinical Stroke scales, Scales used in spinal cord injury, Scales for the assessment of movement disorders, Multiple sclerosis, Scales for assessment of Brain injury And Cognitive scales,

Laboratory Examination related to Neurological Disorders: Lumbar puncture & CSF Analysis

Neuro-dynamic tests.

Slump test

SLR

ULTT

UNIT-IV:PHYSIOTHERAPY IN PAEDIATRIC NEUROLOGY

Pre & post-natal Development sequence of normal child.

Developmental milestones, Neonatal reflexes, various periods of growth,

General assessment of child

Treatment techniques: NDT approach, Roods approach,Vojta techniques,

Early identification and intervention Important Screening Tests.

Developmental Screening Tests.

Tests of motor function.

Nutrition and Immunization: Normal nutritional requirements of a child,

High risk infants, risk factors, neonatal assessment, developmental intervention, ICU, NICU & IMC Care.

UNIT-V

Cerebral Palsy: types, etiology, clinical features, management and rehabilitation of various types of cerebral palsies various approaches used in C.P.

Physiotherapy in Neurological affection of childhood: poliomyelitis, spina bifida, hydrocephalus, meningitis, encephalitis, inflammatory disorders of brain and spinal cord, birth injuries of brachial plexus

Physiotherapy in Muscular Disorders:
a. myopathies of childhood.
b. types of muscular dystrophies,
c. floppy muscular dystrophy;

Role of Physiotherapy in Genetic Disorders:
a. Down syndrome,
b. Fragile X Syndrome,
c. Rett's Syndrome,
d. Spinal Muscular Atrophy

Books suggested :

1. Cash's textbook of neurology for physiotherapists - Downi - J.P.Brothers.
2. Neurological Physiotherapy - A problem solving approach - Susan Edwards - Churchill Livingstone.
3. Neurological Rehabilitation - Umpherd - Mosby.
4. Motor Assessment of Developing Infant - Piper & Darrah - W.E. Saunders.
5. Paediatric Physical Therapy - Teckling - Lippmcott

6. Treatmentof Cerebral Palsy and Motor Delay - Levins - Blackwell Scientific Publications London.
7. Physiotherapy in Paediatrics – Shephered – Butterworth Heinrnann
8. Treatment of Cerebral Palsy and Motor Delay-Sophie Levitt
9. Brain's Disease of the Nervous System - Nalton - ELBS.
10. Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
11. Principles of Neurology - Victor - McGraw Hill lnternational edition.
12. Physical Medicine & Rehabilitation-Susan Sullivan
13. Neurological Rehabilitation-Illus
14. Physical Medicine & Rehabilitation-Delsore
15. Assessment in Neurology-Dejong.
16. Differential Diagnosis-John PatternNeurology in Clinical Practice – Bradley&Daroff
17. Neurological Assessment-Blicker staff
18. Davidson's principles and Practices of Medicine - Edward Churchill Livingstone
19. Hutchinson's Clinical Methods – Swash – Bailliere Tindall
20. Neurological Physiotherapy - A problem solving approach - Susan Edwards - Churchill Livingstone.
21. Neurological Rehabilitation - Umpherd - Mosby.
22. Motor Assessment of Developing Infant - Piper & Darrah - W.E. Saunders.
23. Paediatric Physical Therapy - Teckling - Lippmcott
24. Treatment of Cerebral Palsy and Motor Delay-Sophie Levitt
25. Brain's Disease of the Nervous System - Nalton - ELBS.
26. Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
27. Principles of Neurology - Victor - McGraw Hill lnternational edition.

COURSE OUTCOME: After the end of the course, students will be able to:

CO1:Understand the basic neurological conditions which commonly cause disability and their management.(Bloom's level-L2)

CO2:Apply neurological assessment scale.(Bloom's level-L3)

CO3: Assess and evaluate the neurological conditions.(Bloom's level -L4).

CO4: Know the etiology, Classification, Pathology, Clinical Features, Complications, Surgical & Non Surgical Management of various Neurological Conditions.(Bloom's Level-L1)

CO5:Understand the development of a normal child.(Bloom's level-L2)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	H	M	M	M	H	M	L	M	H	H
CO2	L3	M	H	H	M	M	L	-	L	H	H
CO3	L4	H	H	H	H	H	H	H	H	H	H
CO4	L1	H	H	H	M	H	H	L	M	H	H
CO5	L2	H	M	L	L	L	H	-	L	H	L

H- High, M- Moderate, L- Low, '-' for No correlation

ASSESSMENT AND EVALUATION IN MUSCULOSKELETAL PHYSIOTHERAPY &PHYSIOTHERAPY IN NON-TRAUMATIC ORTHOPAEDIC CONDITIONS
MPT 106 B

COURSE OBJECTIVES:

- To understand human skeletal system and its anatomy
- To assess,examine and evaluate various orthopedics conditions
- To understand various physiotherapy treatment methods used in orthopedic conditions

UNIT 1—Introduction of Assessment Techniques

Physiotherapeutic assessment, evaluation and clinical reasoning in orthopedics
Introduction to various concepts of physical assessment
Maitland
James
Cyriax
Overview of various investigatory procedures (Hematology and Serology, imaging techniques, arthroscopy, BMD)
Assessment of Amputee
Examination and assessment of geriatric patient
Functional Assessment

UNIT II-Examination of Upper Extremity

Shoulder
Elbow
Forearm,
Wrist and Hand

UNIT III- Examination of lower extremity & Examination of Spine

Pelvis
Hip
Knee
Lower Leg, Ankle and Foot
Head and Face
Cervical spine
Thoracic Spine
Lumbar Spine

UNIT IV-General Orthopedics

Infections in bones and joints:- Acute, Chronic

Rheumatic disorders
Generalized affections of bone and joints (metabolic & endocrinal)
Development disorders. (cartilaginous dysplasis, bony dysplasis& chromosomal abnormalities etc.)
Congenital disorders
Degenerative disorders
Tumors of bones
Osteonecrosis and Osteochondritis
Bony & Soft Tissue disorders of:-
Shoulder and arm
Elbow and forearm
Wrist and hand

UNIT V

Bony & Soft Tissue disorders of:
Hip and thigh
Knee and leg
Ankle and foot
Vascular and Neuromuscular Disorders.
Thoracic outlet/ inlet syndrome
Compartment syndrome.
Neuropathies,
Neuralgia, Neuritis
Reflex Sympathetic Dystrophy
Poliomyelitis,

Books suggested :

1. Turek'sOrthopaedics: Principles and their Application, Weinstein SL and Buckwalter JA, Lippincott
2. Apley's System of Orthopaedics and Fractures, Louis Solomon , Arnold publishers.
3. Textbook of Orthopaedics, Adams: Churchill Livingstone
4. Clinical Orthopaedic Rehabilitation, Brent Brotzman.
5. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
6. Tidy's Physiotherapy, Ann Thomasons,Varghese publishing House.
7. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
8. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.
9. Pain Series Rene Calliet., Japee Brothers.
10. Physical therapy of shoulder, Robert A Donatelli, Churchill Livingstone
11. Geriatric physiotherapy Guccione AA, Mosby.

12. Hand practice, Principle and Practice, Mauren Salter, Butterworth Heinemann.
13. Essentials of Orthopaedics and Applied Physiotherapy, Jayant Joshi,prakash Kotwal; Churchill Livingstone
14. Essential Orthopaedics, J Maheshwari, Mehta Publishers.
15. Practical Orthopaedic Medicine, Brain Corrigan, Butterworth.
16. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins.

COURSEOUTCOME: After the end of the course, the student will be able to

CO1: Integrate the knowledge gained by the students in clinical orthopedics with skills gained to apply these in clinicalsituationofdysfunctionandMusculo-skeletalpathology.(Bloom's Level-L3)

CO2: Identify disability due to Musculoskeletal dysfunction, set treatment goals and apply their skills gained in exercise therapy, electrotherapy and massage in clinical situations to restore musculoskeletalfunction.(Bloom's Level-L5)

CO3: Assess and evaluate Upper Extremity.(Bloom's Level-L5)

CO4: Assess and evaluate Lower Extremity.(Bloom's Level-L5)

CO5: Assess and evaluate Spine Extremity.(Bloom's Level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L3	M	H	M	M	M	M	M	H	H	H
CO2	L5	M	H	H	H	M	M	M	M	H	H
CO3	L5	M	H	M	L	-	H	L	M	H	H
CO4	L5	M	H	M	L	-	H	L	M	H	H
CO5	L5	M	H	M	L	-	H	L	M	H	H

H- High, M- Moderate, L- Low, '-' for No correlation

Sports Traumatology I & Sports Traumatology 2
MPT 106 C

Course objective:

- To understand the mechanism of sports injury.
- To gain knowledge about prevention technique from sports injury.
  to learn the details sports rehabilitation.

Sports Traumatology I

UNIT 1-Assessment and evaluation in Sports Injuries

Importance of assessment & evaluation

Outlines of principles and Methods of evaluation

Clinical Examination,Investigative Proceduresand documentation of sports injuries

Causes & Mechanism of Sports Injuries

Prevention of Sports injuries

Principle of management of sports injuries

Evaluation of Physical Fitness

Assessment of components of physical fitness including functional tests: muscle strength, flexibility, agility, balance, co-ordination, sensory deficits, cardio-pulmonary endurance

Sports-Specific evaluation and criteria for return to sport

UNIT II - Lower Limb & Upper limb Examination

Examination of lower limb

Common acute and overuse injuries of lower Extremity(with respect to causation, prevention and management) of:

Pelvis

Hip

Thigh

Knee

Leg

Ankle and Foot

Examination of Upper Extremity

Common acute and overuse injuries of upper extremities (with respect to causation, prevention and management) of:

Shoulder girdle

Shoulder

Arm

Elbow &Forearm

Wrist and hand.

Sports Traumatology 2

UNIT III: Assessment of vertebral column:

Cervical

Thoracic

Lumbo-scaral including Tests of Neural Tension.

Common sports injuries of spine with respect to causation, prevention and management

Sporting emergencies & first aid

Head and neck

Face

Abdominal injuries

UNIT IV: Cardio pulmonary Resuscitation; Shock management, Internal and External Bleeding, Splinting, Stretcher use-Handling and transfer

Management of Cardiac Arrest, acute asthma, epilepsy, drowning, burn

Medical management of Mass Participation

Heat stroke and Heat illness.

UNIT V

Kin anthropometric evaluation

Kinesiological EMG

Sports specific injuries, with special emphasis on the specific risk factor, nature of Sports, kind of medical intervention anticipated and prevention with respect to various sporting events

Individual events: Field & Track

Team events: Hockey, Cricket, and Football

Contact and Non-contact sports

Water sports

Books suggested :

1. Morris B. Mellion: Office Sports Medicine, Hanley &Belfus.
2. Richard B. Birrer: Sports Medicine for the primary care Physician, CRC Press.
3. Torg, Welsh & Shephard: Current Therapy in Sports Medicine III - Mosby.
4. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
5. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
7. Gould: Orthopaedic Sports Physical Therapy, Mosby.
8. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists,Heinmann.
9. D. Kulund: The Injured Athlete, Lippincott.
10. Nicholas Hershman: Vol. I The Upper Extremity in Sports Medicine.

a. Vol. II The Lower Extremity and Spine in Sports Medicine.
b. Vol. III The Lower Extremity and Spine in Sports Medicine.
c. Mosby.
11. Lee & Dress: Orthopaedic Sports Medicine - W.B Saunders.
12. K. Park: Preventive and Social Medicine - BanarsiDassBhanot - Jabalpur.
13. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams andWilkins.
14. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
15. Lars Peterson and Per Renstron: Sports Injuries – Their prevention and treatment,Dunitz.

COURSE OUTCOMES After the end of the course, the student will be able to

CO1:Student able to do diagnosis of sports injury. (Bloom's Level-L5)

CO2:Acquire knowledge on prevention and health promotion.(Bloom's Level-L2)

CO3:Assess and provide physiotherapeutic techniques in Sports conditions for relief of pain, relaxation, conditioning and posture.(Bloom's Level-L4).

CO4: Know how to prevent and manage sports injuries.(Bloom's Level-L1)

CO5:Understand the mechanism of sports injury.(Bloom's Level-L2)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	**PSO1**	**PSO2**
CO1	**L5**	**M**	**M**	**M**	**M**	**L**	**H**	**H**	**H**	**H**	**H**
CO2	**L2**	**H**	**L**	**H**	**M**	**H**	**H**	**H**	**L**	**H**	**H**
CO3	**L4**	**M**	**H**	**M**	**H**	**H**	**M**	**H**	**H**	**H**	**H**
CO4	**L1**	**H**	**L**	**L**	**M**	**-**	**M**	**-**	**L**	**H**	**H**
CO5	**L2**	**H**	**L**	**L**	**M**	**-**	**M**	**-**	**L**	**H**	**H**

H- High, M- Moderate, L- Low, '-' for No correlation

MPT 2ND YEAR

BIOENGINEERING AND REHABILITATION PRINCIPLES
MPT 201

COURSE OBJECTIVE:

- To identify the role of different professional in the field of rehab.
- To understand the major services provided in rehabilitation.
- To acquire knowledge of orthotic and prosthesis.

UNIT-I

Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation. International classification of functioning, Epidemiology of disability with emphasis on locomotors disability, impact of disability on individual, family, and society.Preventive aspects of disability and organizational skills to run disability services.

UNIT-II

Model of service delivery : feature, merits and demerits of institutional based rehabilitation,outreachprogrammes, Community based rehabilitation, Legal Aspect in Disabilities: PWD act, national trust act, RCI act, Statutory provisions Schemes of assistance to persons with disabilitiesGovt and NGO participation in disability RCI.

UNIT-III

Principles of Orthotics- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

Orthotics for the Upper Limb

Orthotics for the Lower Limb

Orthotics for the Spine

Principles of prostheses- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

UNIT-IV

An outline of principles and methods of rehabilitation of speech and hearing disability

An outline of principles and methods of vocational and social rehabilitation

An outline of principles and methods of rehabilitation of mentally handicapped.

UNIT-V

An outline of principles, methods and scope occupational therapy

Architectural Barriers: Describe architectural barriers and possible modifications with reference to Rheumatoid Arthritis, CVA, Spinal Cord Injury and other disabling conditions.

An outline of the principles and process of disability evaluation

COURSE OUTCOMES After the end of the course, the student will be able to

CO1:Understandtheirroleinthemanagement ofthedisabilitywithintherehabilitationteamand understand the concept of team approach inrehabilitation.(Bloom's Level-L2)

CO2:Identify the residual potentials in patients with partial or total disability (temporary or permanent) and understand the use of various orthotics and prosthetics devices.(Bloom's Level-L2,L3)

CO3:Formulateappropriate goals (long & short term) in treatment &rehabilitation and prescribe, check - out and train theuses of various rehabilitation aids.(Bloom's Level-L5).

CO4: Understand all services provided by various govt. agencies. (Bloom's level-L2)

CO5: Assess and evaluate Disability.(Bloom's level-L4)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	M	H	H	M	M	M	L	L	-	**M**
CO2	L2	H	M	H	H	M	M	L	M	-	**M**
CO3	L5	M	H	M	H	H	M	M	H	-	**M**
CO4	L2	H	L	-	-	L	H	-	L	-	**M**
CO5	L4	M	M	L	L	L	H	L	L	-	**M**

H- High, M- Moderate, L- Low, '-' for No correlation

Applied Exercise Physiology
MPT 202(A)

Course Objective:

- To obtained knowledge of muscle physiology and effects of aging.
- To acquire theoretical knowledge of exercise physiology, nutrition and environmental factors in exercise.
- To understand the ECG interpretation, exercise testing, exercise prescription and nutrition.
- To know the importance of ethically-grounded care for diverse clients, patients and/or athletes.

UNITI-Training and conditioning

Physiological basis of physical training, training principles, interval training, continues running concept of anaerobic threshold and vo2 max, physiological effects of various physical training methods,- aerobic and anaerobic training, strength training factors influencing training effects – intensity, frequency, duration , detraining,, process of recovery, post exercise oxygen consumption factors affecting recovery process, overtraining.

UNIT II-Body temperature regulation during exercise

Mechanism of regulation of body temperature, Body temperature responses during exercise, Physiological responses to exercise in the heat, Acclimatization to exercise in the heat, Effects of age and gender on body temperature regulation during exercise, Physical activity and heat illness[heat exhaustion, dehydration exhaustion heat cramps & heat stroke] Prevention of Heat Disorder. Exercise in the Cold, Effects of exposure to cold and severe cold ,Wind chill, Temperature receptors., Role of hypothalamus, shivering, Frost Bite and other problems, Clothing and Environment.

UNIT III- 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, oxygen dissociation curve at altitude, disorders associated with altitude training.

UNIT IV-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.

UNIT V- Physical activity, body composition, energy balance and weight control

Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome, Healthy weight loss, Ways and methods of weight reduction, fluid maintenance, disordered eating, nutritional ergogenic aids, diet supplements in athletes and others involved in physical activity.Exercise and Diabetes Mellitus

Exercise in insulin, requiring diabetes and non-insulin dependent diabetes mellitus, Effect of physical training on glucose tolerance and insulin sensitivity, Management of diabetes by diet and insulin.

Books suggested:

1. Essentials of Exercise Physiology: McArdle, WD, Katch, FI, and Katch, VL. 2nd edn, Lippincott Williams and Wilkins (2000)·
2. Fundamentals of Exercise Physiology: For Fitness Performance and Health, Robergs RA, and Roberts, S.O. McGraw Hill (2000)
3. Exercise Physiology: Powers, SK and Howley ET. 4th edn; Mc Graw Hill (2001)
4. Physiology of Sport and Exercise: Wilmore, JH and Costil, DL. Human Kinetics (1994)
5. Exercise Physiology- Human Bioenergetics and its Application: Brooks, GA, Fahey, TD, White, TP. Mayfield Publishing Company (1996)
6. Komi, P. (Ed.) (1992) Strength and power in sport. Blackwell Scientific Publications.

PAPER CODE: MPT 202(B)
DISASTER MANAGEMENT

Theory

External Assessment-70
Internal Assessment- 30
Total Marks-100
Pass Marks-50% in each
Time- 3 hrs

UNIT I:

- Definition and types of disaster Hazards and Disasters,
- Risk and Vulnerability in Disasters, Natural and Man-made disasters, earthquakes, floods drought, landside, land subsidence, cyclones, volcanoes, tsunami, avalanches, global climate extremes.
- Man-made disasters: Terrorism, gas and radiations leaks, toxic waste disposal, oil spills, forest fires.

Unit: II

- Study of Important disasters
- Earthquakes and its types, magnitude and intensity, seismic zones of India, major fault systems of India plate, flood types and its management, drought types and its management, landside and its managements case studies of disasters in Sikkim (e.g) Earthquakes, Landside).
- Social Economics and Environmental impact of disasters.

Unit: III

- Mitigation and Management techniques of Disaster Basic principles of disasters management, Disaster Management cycle, Disaster management policy.
- National and State Bodies for Disaster Management, Early Warming Systems, Building design
- construction in highly seismic zones, retrofitting of buildings. 4

Unit IV

- Training, awareness program and project on disaster management
- Training and drills for disaster preparedness, Awareness generation program
- Usages of GIS and Remote sensing techniques in disaster management,

UNIT V:

- Mini project on disaster risk assessment
- preparedness for disasters with reference to disasters in Sikkim and its surrounding areas.

REFERENCES :

Text Books:

- 1. Disaster Management Guidelines, GOI-UND Disaster Risk Program (2009-2012)
- 2. Damon, P. Copola, (2006) Introduction to International Disaster Management, Butterworth Heineman.
- 3. Gupta A.K., Niar S.S and Chatterjee S. (2013) Disaster management and Risk Reduction, Role of Environmental Knowledge, Narosa Publishing House, Delhi.
- 4. Murthy D.B.N. (2012) Disaster Management, Deep and Deep Publication PVT. Ltd. New Del

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Acquire sound theoretical knowledge of muscle physiology including muscle structure, mechanical properties, fiber types, neural activation, soreness, damage and adaptation, and the effects of aging, immobile/disuse, training, fatigue and spasticity onmuscle.(Bloom's Level-L2)

CO2: Acquire theoreticalknowledgeof exercisephysiology including exercisemetabolism, cardio-respiratory response to exercise, energy,nutrition and environmentalfactorsin exercise.(Bloom's Level-L2)

CO3: Critically evaluate and synthesis research and professional literature relating to a chosen topic in the muscle/exercisephysiology to analyze and interpret electro diagnosticprocedures.(Bloom's Level-L5)

CO4:Demonstrate knowledge in the exercise sciences including ECG interpretation, exercise testing, exercise prescription and nutrition.(Bloom's level-L3)

CO5: Understand the importance of ethically-grounded care for diverse clients, patients and/or athletes(Bloom's Level-L2)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	**PSO1**	**PSO2**
CO1	**L2**	**H**	**H**	**H**	**M**	**L**	**M**	**L**	**L**	**M**	**M**
CO2	**L2**	**H**	**M**	**H**	**H**	**M**	**M**	**L**	**M**	**-**	**-**
CO3	**L5**	**H**	**H**	**H**	**H**	**H**	**M**	**H**	**H**	**L**	**M**
CO4	**L3**	**M**	**H**	**H**	**M**	**L**	**L**	**-**	**H**	**-**	**L**
CO5	**L2**	**H**	**L**	**-**	**L**	**L**	**H**	**H**	**-**	**-**	**-**

H- High, M- Moderate, L- Low, '-' for No correlation

SPECILIZATION IN NEURO PHYSIOTHERAPY

PHYSIOTHERAPY& REHABILITATION IN NEUROLOGICAL DISORDERS –I
MPT 203A

COURSE OBJECTIVE:

- To understand sign and symptoms of neurological disorders.
- To understand the infections of brain.
- To understand movement and vascular disorders of brain.

UNIT 1-Cerebral Trauma (Head and Brain Injury)

Epidemiology, Pathophysiology, Symptoms, Signs, Investigation, Management, Pre and Post Operative Physiotherapy, Complications.

Closed skull Fractures.

Hematomas: Epidural, Sub Dural, Intracerebral

Open cranio-cerebral injuries

Reconstruction operation in head injuries

Stupor and Coma

The Neural basis of consciousness.

Lesions responsible for Stupor and Coma

The assessment and Investigation of the unconscious patient.

The Management of the Unconscious patient.

UNIT 2- Disorders of the Cerebral Circulation - Stroke

Epidemiology of the stroke and TIA

Causes,types and pathophysiology

Clinical features & investigations

Treatment of different type of stroke

Recovery & rehabilitation

Stroke prevention

Neoplastic lesion -

Intracranial Tumors

Cerebral Hemisphere

Tumors from related structures, Meninges, Cranial Nerves.

cerebellar

8. Cerebrovascular Diseases

Intracranial Aneurysm

Spontaneous Subdural

Extradural Hemorrhage
Intracerebral Hemorrhage
Subarachnoid hemorrhage
AV Malformations

UNIT 3-Infections
Meningitis
Encephalitis
Brain abscess
Neuro Syphilis(Tabes dorsalis)
Herpes Simplex
Chorea
Tuberculosis
Chronic fatigue syndrome
AIDS

UNIT 4-Demyelinating Diseases of the Nervous system
Classification of Demyelinating Diseases
Multiple Sclerosis.
Diffuse Sclerosis

UNIT 5-Movement disorders
Akinetic-rigidity Syndromes disorder and other extra Pyramidal Syndromes
Dyskinetic disorders.

Books suggested:

1. Cash's textbook of neurology for physiotherapists - Downi - J.P.Brothers.
2. Adult Hemiplegia - Evaluation & treatment - Bobath - Oxford Butterworth Heinmann.
3. Neurological Rehabilitation - Carr&Shephered -Butter worth Heinmann.
4. Tetraplegia &Paraplegeia - A guide for physiotherapist - Bromley - Churchill Livingstone.
5. Neurological Physiotherapy - A problem solving approach - Susan Edwards - Churchill Livingstone.
6. Neurological Rehabilitation - Umpherd - Mosby.
7. Geriatric Physical Therapy - Gucciona - Mosby.
8. Brunnstrom's Movement Therapy in Hemiplegia-Sawner&LaVigne-Lippincott
9. Treatment of Cerebral Palsy and Motor Delay-Sophie Levitt
10. Motor Relearning Programme for stroke-carr&Shepherd

11. Right in the Middle-Patricia M.Davies-Springer
12. Brain's Disease of the Nervous System - Nalton - ELBS.
13. Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
14. Principles of Neurology - Victor - McGraw Hill lnternational edition.
15. Davidson's Principles and practices of medicine - Edward – Churchill Livingstone.
16. Physical Medicine & Rehabilitation-Susan Sullivan
17. Neurological Rehabilitation-Illus
18. Physical Medicine & Rehabilitation-Delsore
19. Assessment in Neurology-Dejong.
20. Differential Diagnosis-John PatternNeurology in Clinical Practice – Bradley&Daroff
21. Neurological Assessment-Blicker staff.
22. Steps to follow-PATRICIA M.DAVIES-Springer.
23. Muscle Energy Techniques-Chaitow-Churchill Living Stone.
24. Clinical Evaluation of Muscle Function-Lacote- Churchill Living Stone.
25. Davidson's principles and Practices of Medicine - Edward Churchill Livingstone.
26. Hutchinson's Clinical Methods – Swash – Bailliere Tindall..
27. A Short Textbook of Medicine - Krishna Rao - Jaypee Brothers.
28. A Short textbook ofPsychiatry_ Ahuja Niraj - Jaypee Brothers.

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Identify the diseases of brain.(Bloom's Level-3)

CO2: Differentiate the diagnose of the disease for brain.(Bloom's Level-L4)

CO3: Evaluate conditions and prescribe appropriate physiotherapy treatment.(Bloom's Level-L5)

CO4: Differentiate the various brain infections.(Bloom's level-L4)

CO5: Assess and manage movement disorders.(Bloom's Level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L3	H	H	H	M	M	M	L	L	H	H
CO2	L4	M	M	H	H	H	M	L	M	H	H
CO3	L5	M	H	L	H	H	M	H	H	H	H
CO4	L4	M	L	H	L	L	M	-	L	H	H
CO5	L5	M	H	H	M	H	M	L	M	H	L

H- High, M- Moderate, L- Low, '-' for No correlation

PHYSIOTHERAPY & REHABILITATION IN NEUROLOGICAL DISORDERS –II

PAPER CODE: MPT 204A

COURSE OBJECTIVES:

- To learn different physiotherapeutic strategies that can assist recovery of normal function from neurological dysfunction.
- To understand the conservative and surgical management of neurological condition as relevant to physiotherapy.
- To correlate the knowledge gained in understanding the neurological dysfunction.

UNIT I. Degenerative Diseases of the Spinal cord and Cauda Equina

Ataxia (sensory)
Motor Neuron Disease
Spinal Muscular Atrophy
Spino-cerebellar Degeneration(Friedreich's Ataxia)
Transverse Myelitis

UNIT II.Disorders / rehabilitation of the spinal cord & cauda equina

Acute Traumatic injuries of the spinal cord
Slow progressive compression of the spinal cord
Syringomyelia
Ischemia and infection of the Spinal Cord (Transverse myelitis) and Cauda Equina
Tumors of Spinal Cord
Surges surgical management in Spinal Cord

UNIT III.Disorders of peripheral nerves:

Peripheral neuropathies and peripheral nerve lesions
Clinical diagnosis of peripheral neuropathy
All types of levels of peripheral neuropathies and brachial plexus lesions
Causalgia
Reflex sympathetic dystrophy
Traumatic, Compressive and
Ischemic neuropathy
Spinal Radiculitis and Radiculopathy
Hereditary motor and sensory neuropathy
Acute idiopathic polyneuritis
Neuropathy due to infections
Vasculomotor neuropathy
Neuropathy due to Systemic Medical Disorders
Drug induced neuropathy
Metal poisoning, Chemical neuropathies
Polyneuropathies:Acute,Subacute and Chronic level polyneuropathy
Surgeries on peripheral Nerves

UNIT IV.Disorders of muscles:

Muscular dystrophies of adulthood
The Myotonic disorders
Inflammatory disorders of muscle
Myasthenia gravis
Endocrine and metabolic myopathies
Duchene muscular dystrophy
Progressive muscular dystrophy.

UNIT V

a) Deficiency & Nutritional Disorders, Deficiency of vitamins & related disorders, Other nutritional neuropathies
b) Disorders of Autonomic nervous system:Bladder and Bowel dysfunction,,Orthostatic hypotension, Autonomic dysreflexia, Autonomic Neuropathy.
c) Nervous system aging effects and Geriatric neurological disorders

Books suggested:

1. Cash's textbook of neurology for physiotherapists - Downi - J.P.Brothers.
2. Adult Hemiplegia - Evaluation & treatment - Bobath - Oxford ButterworthHeinmann.
3. Neurological Rehabilitation - Carr&Shephered -Butter worth Heinmann.
4. Tetraplegia &Paraplegeia - A guide for physiotherapist - Bromley – Churchill Livingston
5. Neurological Physiotherapy - A problem solving approach - Susan Edwards - Churchill Livingstone.
6. Neurological Rehabilitation - Umpherd - Mosby.
7. Geriatric Physical Therapy - Gucciona - Mosby.
8. Brunnstrom's Movement Therapy in Hemiplegia-Sawner&LaVigne-Lippincott
9. Treatment of Cerebral Palsy and Motor Delay-Sophie Levitt
10. Motor Relearning Programme for stroke-carr&Shepherd
11. Right in the Middle-Patricia M.Davies-Springer
12. Brain's Disease of the Nervous System - Nalton - ELBS.
13. Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone.
14. Principles of Neurology - Victor - McGraw Hill lnternational edition.
15. Davidson's Principles and practices of medicine - Edward – Churchill Livingstone.
16. Physical Medicine & Rehabilitation-Susan Sullivan
17. Neurological Rehabilitation-Illus
18. Physical Medicine & Rehabilitation-Delsore
19. Assessment in Neurology-Dejong.
20. Differential Diagnosis-John PatternNeurology in Clinical Practice – Bradley&Daroff
21. Neurological Assessment-Blicker staff.

22. Steps to follow-PATRICIA M.DAVIES-Springer
23. Muscle Energy Techniques-Chaitow-Churchill Living Stone
24. Clinical Evaluation of Muscle Function-Lacote- Churchill Living Stone
25. Davidson's principles and Practices of Medicine - Edward Churchill Livingstone
26. Hutchinson's Clinical Methods – Swash – Bailliere Tindall.
27. A Short Textbook of Medicine - Krishna Rao - Jaypee Brothers
28. A Short textbook ofPsychiatry_ Ahuja Niraj - Jaypee Brothers.

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Formulate a rationalized physiotherapy plan for the patient.(Bloom's Level-L5)

CO2: Compare & contrast the outcome of various physiotherapy treatment approaches to rehabilitate patient.(Bloom's level-L5)

CO3: Implement necessary physiotherapy treatment, document the status of the patients as written records (Bloom's Level-L4).

CO4: Assess and manage peripheral nerve disorders.(Bloom's level-L5)

CO5: Differentiate nutritional deficiency disorders.(Bloom's level-L4)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L5	H	H	H	M	M	H	M	H	H	H
CO2	L5	H	H	M	H	M	M	M	M	H	H
CO3	L4	M	H	H	H	M	M	H	L	H	H
CO4	L5	M	H	H	M	H	M	L	M	H	H
CO5	L4	M	L	H	L	L	M	-	L	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

CURRENT CONCEPTS IN NEURO PHYSIOTHERAPY
PAPER CODE: MPT 205A

COURSE OBJECTIVES:

- To understand the recent concepts in treatment of neurological conditions.

UNIT 1

Treatment planning process:

Classification of treatment techniques based on current concepts & approaches.

All types of strengthening techniques.

Overview of Neurological Impairments and their treatment, with emphasis on recording and documentation.

Therapeutic exercises used in neurological disorders.

UNIT 2

Neuromuscular Training

Methods For Optimizing Neuromuscular & Postural Control : Proprioception Training And Kinesthetic Training (Sensory Integration),

Problem Solving Approach,

Motor Control,

Clinical Decision Making And Clinical Reasoning,

Evidence Based Practice.

UNIT 3

Advanced Neuro-therapeutic techniques:

Muscle Energy Techniques (MET) Reflexology,

Cranio-sacral therapy,

Motor learning Theories – Concept, Therapeutic, Positional.

Myofacialrelease techniques

Biofeedback,

UNIT 4

Nerve mobilization (Concept): Butler concept.

Management of pain and Spasticity and paralysis in neurological disorders.

UNIT 5

Special Neurological Approaches and Their Concept:

Neurodevelopment Approach,

Brunnstrom's Approach,

PNF Approach,

MRP and Inhibition & facilitation techniques.

Modified CIMT.

Electrotherapy in Neurological disorders.

Books suggested:

1. Adult Hemiplegia - Evaluation & treatment - Bobath - Oxford Butterworth Heinmann.
2. Neurological Rehabilitation - Carr&Shephered -Butter worth Heinmann.
3. Tetraplegia &Paraplegeia - A guide for physiotherapist - Bromley - Churchill Livingstone.
4. Neurological Physiotherapy - A problem solving approach - Susan Edwards - Churchill Livingstone.
5. Neurological Rehabilitation - Umpherd - Mosby.
6. Geriatric Physical Therapy - Gucciona - Mosby.
7. Motor Assessment of Developing Infant - Piper & Darrah - W.E. Saunders.
8. Paediatric Physical Therapy - Teckling - Lippmcott
9. Treatmentof Cerebral Palsy and Motor Delay - Levins - Blackwell Scientific Publications London.
10. Physiotherapy in Paediatrics – Shephered – Butterworth Heinrnann
11. Brunnstrom's Movement Therapy in Hemiplegia-Sawner&LaVigne-Lippincott
12. Treatment of Cerebral Palsy and Motor Delay-Sophie Levitt
13. Motor Relearning Programme for stroke-carr&Shepherd
14. Right in the Middle-Patricia M.Davies-Springer
15. Physical Medicine & Rehabilitation-Susan Sullivan
16. Neurological Rehabilitation-Illus
17. Physical Medicine & Rehabilitation-Delsore
18. Differential Diagnosis-John PatternNeurology in Clinical Practice – Bradley&Daroff
19. Steps to follow-PATRICIA M.DAVIES-Springer
20. Muscle Energy Techniques-Chaitow-Churchill Living Stone
21. Clinical Evaluation of Muscle Function-Lacote- Churchill Living Stone

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Understand the changing knowledgebase in neurologyand the international context and sensitivities of thearea.(Bloom's Level-L2)

CO2: Evaluate and synthesize research and professional literature and apply this information to clinicalsituation.(Bloom's Level -L5)

CO3: Articulate their knowledge, understanding and managing neurologicalpatients.(Bloom's Level -L4)

CO4:Apply neurological approaches while treating a patient.(Bloom's Level-L3)

CO5:Understand the basic principles of various treatment techniques.(Bloom's Level-L2)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	M	H	H	H	L	M	L	L	M	M
CO2	L5	M	M	H	H	M	M	M	M	H	M
CO3	L4	H	H	L	H	H	M	M	H	H	H
CO4	L3	M	H	M	L	L	L	-	-	H	H
CO5	L2	H	L	L	M	-	M	-	L	H	L

H- High, M- Moderate, L- Low, '-' for No correlation

SPECILIZATION IN ORTHO PHYSIOTHERAPY

PHYSIOTHERAPY IN TRAUMATIC ORTHOPAEDIC CONDITIONS
PAPER CODE: MPT 203B

COURSE OBJECTIVE:

- To understand human anatomy and physiology of skeletal system
- To evaluate, assess and examine the musculoskeletal conditions
- To understand different surgeries for musculoskeletal system in different conditions.

UNIT 1-Fracture and soft tissue injuries of upper limb

i. Shoulder and arm
ii. Elbow and forearm
iii. Wrist and hand

UNIT 2-Fracture and soft tissue injuries of lower limb

i. Pelvis
ii. Hip and thigh
iii. Knee and leg
iv. Ankle and foot

UNIT 3-Method of different types of some common surgeries and its rehabilitation.

i. Menisectomy
ii. Patellectomy
iii. Arthroplasty :-Shoulder, Elbow, Hip, Knee Arthroplasty.
iv. Arthrodesis :- triple arthrodesis, Hip, Knee, Shoulder Elbow arthrodesis, Spinal Fusion
v. Osteotomy
vi. Bone grafting, Bone Lengthening
vii. Tendon transfers
viii. Soft Tissue release
ix. Nerve Repair and grafting etc.

UNIT 4-Burns

UNIT 5-Amputation

i. Types, Levels & procedures
ii. Pre and post operative rehabilitation.
iii. Prosthesis and stump care.
iv. Limb transplantation Surgery

Books suggested:

1. Turek's Orthopedics: Principles and their Application, Weinstein SL and Buckwalter JA, Lippincott
2. Apley's System of Orthopedics and Fractures, Louis Solomon , Arnold publishers.
3. Textbook of Orthopedics for Fractures, Adams: Churchill Livingstone
4. Clinical Orthopedic Rehabilitation, Brent Brotzman.
5. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
6. Tidy's Physiotherapy, Ann Thomasons,Varghese publishing House.
7. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
8. Textbook of Orthopedics, John Ebnezar, Japee Brothers.
9. Treatment and Rehabilitation of fractures,SHoppenfield, VasanthaLM;Lippincott William and Wilkins.
10. Hand practice, Principle and Practice, Mauren Salter, Butterworth Heinemann.
11. Essentials of Orthopaedics and Applied Physiotherapy, Jayant Joshi,prakash Kotwal; Churchill Livingstone
12. Essential Orthopaedics, J Maheshwari, Mehta Publishers.
13. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins.

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Understand the basic sciences and their integration with musculoskeletal physiotherapy clinical practice.(Bloom's Level-L2)

CO2: Apply sound theoretical and practical knowledge and understanding of musculoskeletal system.(Bloom's Level-L3)

CO3: Perform an appropriate subjective and physical examination.(Bloom's Level-L3)

CO4:Usesuitable analytical skills to evaluate data obtained.(Bloom's level-L3)

CO5: Plan and execute physiotherapy treatment in musculoskeletal system.(Bloom's Level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	H	H	H	M	L	M	L	L	H	H
CO2	L3	H	M	H	H	M	M	L	M	H	H
CO3	L3	M	H	L	H	H	M	L	M	H	H
CO4	L3	M	M	H	H	L	L	-	L	H	H
CO5	L5	M	H	H	M	H	L	-	M	H	H

H- High, M- Moderate, L- Low, '-' for No correlation

PHYSIOTHERAPY IN VERTEBRAL DISORDERS
MPT 204B

COURSE OBJECTIVE:

- To understand human anatomy and physiology of vertebrae
- To evaluate, assess and examine the spinal conditions
- To understand different surgeries for spine.

UNIT 1

I. Review of anatomy and pathomechanics of vertebral column
II. Application of advance techniques like Maitland, McKenzie, Mulligan
III. Principles of management
IV. Congenital disorders of vertebral column.
V. Congenital and Acquired deformities
VI. Ergonomics

UNIT 2-Non traumatic disorders of vertebral column

I. Degenerative
II. Infections
III. Inflammatory
IV. Spinal instabilities

UNIT 3-Traumatic injuries of vertebral column: General & regional injuries, Soft tissue injuries, tightness, structural changes, Bone injuries (fractures & dislocations of spine)**,**pre and post operative management of spinal surgeries.

UNIT 4-Spinal cord injuries

Types, Classifications
Pathology
Level
Examination
Management & rehabilitation
Orthopedic surgeries
Pre & post operative rehabilitation

UNIT 5-Bio engineering appliances & support devices

Books suggested:

1. Turek'sOrthopaedics: Principles and their Application, Weinstein SL and Buckwalter JA, Lippincott
2. Apley's System of Orthopaedics and Fractures, Louis Solomon , Arnold publishers.

3. Textbook of Orthopaedics, Adams: Churchill Livingstone
4. Clinical Orthopaedic Rehabilitation, Brent Brotzman.
5. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
6. Tidy's Physiotherapy, Ann Thomasons,Varghese publishing House.
7. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
8. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.
9. Pain Series Rene Calliet., Japee Brothers.
10. Essentials of Orthopaedics and Applied Physiotherapy, Jayant Joshi,prakash Kotwal; Churchill Livingstone
11. Essential Orthopaedics, J Maheshwari, Mehta Publishers.
12. Practical Orthopaedic Medicine, Brain Corrigan, Butterworth.
13. Principle and Practice of Orthopaedics Sports Medicine, William E Garrett, Lippincott William and Wilkins.
14. Orthopaedic Physical Assessment David J Magee, Saunders
15. Manual Examination and Treatment of the Spine and Extrimities, Carolyn Wadsworth, Williams and Wilkins.
16. Physical Examination of the Spine and Extrimities,Stenley, Lipenfield.
17. Clinical Orthopaedic Examination, Mc Rae, Churchill Livingstone.
18. Muscle Energy Technique, Leon chaitow,Churchill Livingstone.
19. Maitland's vertebral Manipulation, GD Maitland, Butterworth Heinemann.
20. Textbook of Orthopaedic Medicine James Cyriax, AITBS Publishers.
21. Cyriax's Illustrated Manual of Orthopaedic Medicine, JH Cyriax, Butterworth
22. Position Release Technique, Leon chaitow,Churchill Livingstone.
23. Manual Therapy, Brain Mulligan.
24. Butler Neural mobilization, Butler.

COURSE OUTCOMES: After the end of the course, the student will be able to

CO1: Understand of the basic sciences and their integration with spinal conditions.(Bloom's Level-L2)

CO2: Apply theoretical and practical knowledge and understanding vertebral system. (Bloom's Level-L2)

CO3: Perform an appropriate subjective and physical examination of spinal conditions.(Bloom's Level-L3)

CO4: Use suitable analytical skills to evaluate data obtained. (Bloom's level-L3)

CO5: Plan and execute physiotherapy treatment in spinal disorders. (Bloom's Level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	L	H	H	M	L	M	L	L	H	H
CO2	L2	H	M	H	H	M	M	L	M	H	H
CO3	L3	M	H	L	H	H	M	L	M	H	H
CO4	L3	M	M	H	H	L	L	-	L	H	H
CO5	L5	M	H	H	M	H	L	-	M	M	L

H- High, M- Moderate, L- Low, '-' for No correlation

Current Concepts in Musculoskeletal Physiotherapy
MPT 205B

COURSE OBJECTIVES

- To understand skeletal system and biomechanics
- To diagnose, evaluate and assess musculoskeletal system through different techniques
- To understand different techniques used in management of physiotherapy treatment

UNIT 1

I. Pain management
II. Back School
III. Butler mobilization of nerves

UNIT2

Manual Therapy: Introduction, History, Basic Classification, Assessment for manipulation, discussion in brief about the concepts of mobilization like

I. Cyriax,
II. Maitland
III. Mulligan

UNIT 3-Myofasical Release: Concept & brief discussion of its application technique.

UNIT 4-Muscle Energy Techniques **and** Positional release technique.

UNIT 5-Body Composition & Weight Control:

I. Composition of human body
II. Somatotyping
III. Techniques of body composition analysis
IV. Obesity
V. Health risks of obesity
VI. Weight control

Books suggested:

1. Chest physiotherapy in the Intensive Care Unit,Colin F Meckengei, William and Wilkins.
2. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
3. Muscle Energy Technique, Leon chaitow,Churchill Livingstone.
4. Maitland's vertebral Manipulation, GD Maitland, Butterworth Heinemann.
5. Textbook of Orthopaedic Medicine James Cyriax, AITBS Publishers.
6. Cyriax's Illustrated Manual of Orthopaedic Medicine, JH Cyriax, Butterworth

7. Peripheral Manipulation, GD Maitland, Butterworth Heinemann.
8. Position Release Technique, Leon chaitow,Churchill Livingstone.
9. Manual Therapy, Brain Mulligan.
10. Butler Neural mobilization, Butler

COURSE OUTCOMES: **After the end of the course, the student will be able to**

CO1:Understand thecurrent concepts inmusculoskeletal physiotherapy.(Bloom's Level-L2)

CO2: Understand theoretical and practical k n o w l e d g e and understanding of pain management in musculoskeletal system.(Bloom's Level-L2)

CO3:Perform anappropriatesubjective and physical examination in order to apply various treatment technique.(Bloom's level-L3)

CO4:Apply soft tissue release technique to treat conditions.(Bloom's Level-L3)

CO5:Execute techniques of body composition analysis.(Bloom's level-L5)

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	H	H	H	M	M	M	L	M	H	H
CO2	L2	H	H	H	H	M	M	M	H	H	H
CO3	L3	M	H	L	M	M	M	L	M	H	H
CO4	L3	M	H	L	H	L	M	-	L	H	H
CO5	L5	M	H	H	M	H	L	-	M	L	L

H- High, M- Moderate, L- Low, '-' for No correlation

SPECILIZATION IN SPORTS PHYSIOTHERAPY

Non – Traumatic Medical Conditions of Athlete

MPT 203C

COURSE OBJECTIVE:

- To understand medical condition related to athlete.
- To understand impact of medical conditions in athlete.
- To learn how to manage non traumatic medical condition in athlete.

UNIT 1-

I. Illness
II. Hypertension
III. Urine abnormalities
IV. Exercise Induced Asthma
V. Anemia
VI. Delayed onset muscle soreness (DOMS)
VII. Runner's high & Exercise addiction.
VIII. G.I.T. Diseases
IX. Exercises and congestive heart failure
X. Exercise for Post coronary & bye pass patients
XI. Exercise for diabetics

UNIT 2-Diagnosis and management of skin conditions of Athletes

1. Bacterial infections
2. Fungal Infections
3. Viral infections
4. Boils
5. Cellulites.

UNIT 3-Female Specific problems

1. Sports Amenorrhea.
2. Injury to female reproductive tract.
3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes

UNIT 4-Common Infectious disease:

1. Common Cold
2. Diarrhea

3. Dysentery
4. Typhoid
5. Cholera
6. Amoebiasis
7. Food Poisoning
8. Tuberculosis
9. Malaria
10. Hepatitis
11. Venereal disease etc.

UNIT 5-AIDS in sports people.

Books suggested:

1. Morris B. Mellion: Office Sports Medicine, Hanley &Belfus.
2. Richard B. Birrer: Sports Medicine for the primary care Physician, CRC Press.
3. Torg, Welsh & Shephard: Current Therapy in Sports Medicine III - Mosby.
4. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
5. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
7. Gould: Orthopedic Sports Physical Therapy, Mosby.
8. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists,Heinmann.
9. D. Kulund: The Injured Athlete, Lippincott.
10. Nicholas Hershman:
    Vol. I The Upper Extremity in Sports Medicine.
    Vol. II The Lower Extremity and Spine in Sports Medicine.
    Vol. III The Lower Extremity and Spine in Sports Medicine Mosby.
11. Lee & Dress: Orthopedic Sports Medicine - W.B Saunders.
12. K. Park: Preventive and Social Medicine - BanarsiDassBhanot - Jabalpur..
13. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams andWilkins.
14. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
15. Lars Peterson and Per Renstron: Sports Injuries – Their prevention and treatment,Dunitz.;

Course outcome

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Identify the biomechanics of specific sports and the medical conditions associated in a particular sport.	L3
CO2	Select strategies and techniques to prevent exercise induced non traumatic medical conditions	L3
CO3	Evaluate sport specific conditions and evidence based treatment protocols to return to sports	L5
CO4	Formulate and publish research articles	L6
CO5	Evaluate and examine the sports related medical conditions affecting sports performances of an athlete and also to rehabilitate the subjects with there ailments with effective means	L5

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L3	M	M	L	L	L	M	M	L	H	H
CO2	L3	M	H	H	M	M	M	H	M	H	H
CO3	L5	H	H	H	H	H	H	H	H	H	H
CO4	L6	H	H	H	H	H	H	H	H	H	H
CO5	L5	H	H	H	H	H	H	H	H	L	L

H- High, M- Moderate, L- Low, '-' for No correlation

Sports Psychology
MPT 204C

COURSE OBJECTIVE:

- To understand Sports Psychology of a athlete.
- to understand the psychological requirement of an athlete in competition.
- to learn the psychological measure to developed effectiveness of the performance

UNIT 1

I. History and current status of Sports Psychology.

II. Personality Assessment and sports personality.
   1. Theories of personality
   2. Personality assessment

III. Attention and perception in sports.
   1. Attention
   2. Perception

IV. Concentration training in sports.
   1. Basic principles of concentration
   2. Concentration training
   3. Concentration awareness exercises

V. Motivational orientation in sports.
   1. Athlete's needs of motivation
   2. Motivational inhibitors
   3. Motivational techniques

UNIT 2 : Pre-competitive anxiety.
   1. Source of PCA
   2. Effect of PCA on performance

Relaxation Training.
   1. Definition
   2. Types of relaxation trainings
      i) Progressive muscle relaxation
      ii) Breathing exercises
      iii) Yog-nidra
      iv) Transcendental meditation

UNIT 3: Aggression in sports.
   1. Theories of aggression
   2. Management of aggression

IX. Role of Psychology in Dealing with injuries.

Eating disorders.

a. Etiology of eating disorders
b. Types of eating disorders
c. Complications of eating disorders

XI. Goal setting

UNIT 4

I. Psychological aspect of doping
II. Psychological preparation of elite athletes
    1. Concept of psychological preparation
III. Biofeedback training
IV. Mental imagery
V. Stress management
    1. Principles of Stress Management
    2. Stress Management technique.

UNIT 5- Group Behavior and leadership

1. Nature of group behavior and group.
2. Types of group.
3. Educational implication of group behavior.
4. Meaning of leadership, types of leadership quality of leadership, training andfunctioning of leadership.

Emotion

1. Meaning of emotion.
2. Characteristics of emotion.
3. Meaning of controlling and training of emotions and its importance.
4. Contribution of sports to emotional health.
5. Meaning of sentiment, its type, *importance and formation.*

Books suggested:

1. Morgan and King: Introduction to Psychology - Tata McGraw Hill.
2. Suinn: Psychology in Sports: Methods and applications, Surjeet Publications.
3. Grafiti: Psychology in contemporary sports, Prentice Hall.
4. Basmajian: Biofeedback
5. Sanjiv P. Sahni: Handbook of Sports Psychology – A comprehensive manual of Mental Training

Course Outcome:

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand psychological aspects of optimal athletic performance, psychological care and wellbeing of athletes	L2
CO2	Identify techniques to motivate the athletes which will help to improve their performance	L3
CO3	Evaluate which technique (counseling, instructing, mental conditioning etc.) will help an athlete with anxiety and aggression in order to deal with sports injuries.	L5
CO4	Utilize communication skills while working in the sports medicine team.	L3
CO5	Evaluate evidence based psychological regimes with understanding the concepts and role of sports related psychological techniques and other relevant current concepts of treatment in the field of sports Psychology	L5

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	L	M	M	M	M	M	M	M	H	H
CO2	L3	M	M	M	H	M	M	M	M	H	H
CO3	L5	M	M	H	H	M	H	M	M	H	H
CO4	L2	M	M	M	M	M	M	M	M	H	H
CO5	L5	H	H	H	H	H	H	H	H	L	L

H- High, M- Moderate, L- Low, '-' for No correlation

Current Concepts of Sports Medicine Physiotherapy
MPT 205C

Corse outcome:

- To understand new concept in sports physiotherapy.
- To understand exercise for special categories of athlete.
- To identify the proper equipment and assistive device for the athlete.
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UNIT 1

Exercise and Common Pulmonary Conditions
Exercise induced bronchial obstruction
Exercise in chronic airway obstruction
Air pollution and exercise
Exercise and Cardiac Conditions
Exercise prescription for heart disease
Exercise in primary prevention in ischemic heart disease
Exercise for secondary prevention of ischemic heart disease
Diabetes and Exercise
Exercise in diabetic patients
Exercise as a method of control of diabetes.

UNIT 2

Protective equipments design of shoe safety factors in equipment.
Special concerns for handicapped athletes
Disability sports, Paralympics

UNIT 3

Exercises for special categories
Child and adolescent athlete's problems
Special problems of older athletes
Sports and exercise programme for geriatrics and rheumatic population

UNIT 4-Doping in Sports
IOC prohibited drugs- groups and classifications
IOC rules and regulations on doping in sports hazards of prohibited substances.

UNIT 5-Identification of talent for sports –
Meaning and its importance
Detailed procedure for screening and identification of sports talent

Prediction of adult potentials at the young age.

Books suggested :

1. Morris B. Mellion: Office Sports Medicine, Hanley &Belfus.
2. Richard B. Birrer: Sports Medicine for the primary care Physician, CRC Press.
3. Torg, Welsh & Shephard: Current Therapy in Sports Medicine III - Mosby.
4. Zulunga et al: Sports Physiotherapy, W.B. Saunders.
5. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
7. Gould: Orthopaedic Sports Physical Therapy, Mosby.
8. C. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists,Heinmann.
9. D. Kulund: The Injured Athlete, Lippincott.
10. Nicholas Hershman:
    Vol. I The Upper Extremity in Sports Medicine.
    Vol. II The Lower Extremity and Spine in Sports Medicine.
    Vol. III The Lower Extremity and Spine in Sports Medicine Mosby.
11. Lee & Dress: Orthopaedic Sports Medicine - W.B Saunders.
12. K. Park: Preventive and Social Medicine - BanarsiDassBhanot - Jabalpur..
13. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williamsand Wilkins.
14. Scuderi, McCann, Bruno: Sports Medicine – Principles of Primary Care, Mosby.
15. Lars Peterson and Per Renstron: Sports Injuries – Their prevention and treatment,Dunitz.

COURSE OUTCOMES:

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand the current concept of biomechanical assessment of sports and motor control in sportsactivities	L2
CO2	Understand the role of sports physiotherapist in the sports team training and competition setting and the value of communication in the Sports Medicine Teamapproach.	L2
CO3	Select specific screening and preventive conditioning programs for common sports andinjuries	L3
CO4	Develop independent research publications and critically analyze already published articles.	L6
CO5	Evaluate evidence based treatment protocols and other relevant current concepts of treatment in the field of sports physiotherapy	L5

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	L2	M	M	M	M	L	M	M	L	H	H
CO2	L2	M	M	M	L	L	M	M	M	H	H
CO3	L3	M	M	M	M	M	M	H	H	H	H
CO4	L6	H	H	H	H	H	H	H	H	H	H
CO5	L5	H	H	H	H	H	H	H	H	H	H

H- High, M- Moderate, L- Low, '-' for No correlation

6. Teaching-Learning Process/ Methodology (TLM):

The teaching-learning process should be aimed at systematic exposition of basic concepts so as to acquire knowledge of physiotherapy in a canonical manner. The various components of teaching learning process are summarized in the following heads.

1. **Class room Lectures:** The most common method of imparting knowledge is through lectures. There are diverse modes of delivering lectures such as through blackboard, power point presentation and other technology aided means. A judicious mix of these means is a key aspect of teaching-learning process.
2. **Tutorials:** To reinforce learning, to monitor progress, and to provide a regular pattern ofstudy, tutorials are essential requirements. During these tutorials, difficulties faced by the students in understanding the lectures, are dealt with. Tutorials are also aimed at solving problems associated with the concepts discussed during the lectures.
3. **Practical:** To provide scientific visualization and obtaining results of Physiotherapy the practical sessions are conducted inexercise therapy and electrotherapy labs. These sessions provide vital insights into scientific concepts and drawlearner's attention towards limitations of exercise therapy.
4. **Choice based learning/Open elective:** LOCF in this undergraduate programme provides great flexibility both in terms of variety of courses and range of references in each course.
5. **OPD AND HOSPITAL (FIELD BAISED LEARNING) :**Students may enhance their knowledge through rotatory clinical postings, medical camps and visits to special school.
6. **Textbooks learning:** A large number of books are included in the list of references of each course for enrichment and enhancement of knowledge.
7. **E-learning:** Learner may also access electronic resources and educational websites for better understanding and updating the concepts.
8. **Self-study materials:** Self-study material provided by the teachers is an integral part of learning. It helps in bridging the gaps in the classroom teaching. It also provides scope for teachers to give additional information beyond classroom learning.
9. **Assignment/Problem solving:** Assignments at regular intervals involving applications of theory are necessary to assimilate basic concepts of courses. Hence, it is incumbent on the part of a learner to complete open-ended projects assigned by the teacher
10. **WORKSHOP AND SEMINARS:** Workshop and seminar on recent trends in the field of physiotherapy are organized time to time to update with the current scenario.

Clinical learning opportunities imparted through the use of advanced techniques

Teaching modality	Learning opportunity examples
Patients	Teach and assess in selected clinical scenarios
	Practice soft skills
	Practice physical examination
	Receive feedback on performance
Mannequins	Perform acquired techniques
	Practice basic procedural skills
	Apply basic science understanding to clinical problem solving
Simulators	Practice teamwork and leadership
	Perform cardiac and pulmonary care skills
	Apply basic science understanding to clinical problem solving
Task under trainers	As specific to the physiotherapy profession. Joint manipulation, chest physiotherapy etc.

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