

# **Faculty of Sports Medicine & Physiotherapy**

## **SYLLABUS**

### **FOR**

## **MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS)** **(SEMESTER: I – IV)** **(Credit Based Evaluation and Grading System)**

**Session: 2019-20**



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# **GURU NANAK DEV UNIVERSITY**

## **AMRITSAR**

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**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER SYSTEM)**  
(Under Credit Based Continuous Evaluation Grading System)

**Scheme of Examination**

**Duration:** 2 years

**Eligibility:** Bachelor in Physiotherapy with at least 50% marks in aggregate.

**Scheme of Examination**

**A. Theory Examination:**

**Semester – I:**

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
OPL501	C	Basic Medical Science & Conditions	4	–	–	4	20+80=100
OPL502	C	Human Kinesiology	4	–	–	4	20+80=100
OPL503	C	Assessment & Diagnosis of Orthopedic Conditions	4	–	–	4	20+80=100
OPL504	C	Research Methodology & Biostatistics	4	–	–	4	20+80=100
<b>Audit Course</b>							
OPP511	A	Clinical Training–I	–	–	6	6	

**Semester – II:**

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
OPL551	C	Applied Clinical Sciences	4	–	–	4	20+80=100
OPL552	C	Human Biomechanics	4	–	–	4	20+80=100
OPL553	C	Basic Physiotherapy Methods	4	–	–	4	20+80=100
OPL554	C	Physiotherapy in Traumatic Orthopedic Conditions	4	–	–	4	20+80=100
<b>Audit Courses</b>							
OPP561	A	Clinical Training–II	–	–	6	6	
OPD562	A	Dissertation	–	–	8	8	

**Note:-**

**PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory Paper) Students can opt. in any semester except Semester 1<sup>st</sup>. This ID Paper is one of the total ID Papers of this course.**

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER SYSTEM)**  
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**Semester – III**

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
OPL601	C	Advanced Physiotherapy Methods	4	–	–	4	20+80=100
OPL602	C	Anthropometry	4	–	–	4	20+80=100
OPL603	C	Work Physiology	4	–	–	4	20+80=100
OPL604	C	Physiotherapy in Non-Traumatic Orthopedic Conditions	4	–	–	4	20+80=100
<b>Audit Courses</b>							
OPP611	A	Clinical Training–III	–	–	6	6	
OPD612	A	Dissertation	–	–	8	8	
<b>Interdisciplinary/Optional Course</b>							
	I	Interdisciplinary/Optional Course	4	-	-	4	

**Semester – IV**

Course No.	C/E/I/A	Course Title	L	T	P	Total Credits	Marks (Mid Semester + Major Exam)
<b>Core Courses</b>							
OPL651	C	Spinal & Peripheral Orthopedic Physiotherapy	4	–	–	4	20+80=100
OPL652	C	Physiotherapy approach to Gait & Posture	4	–	–	4	20+80=100
OPL653	C	Orthopedic Rehabilitation & Ethical Principles	4	–	–	4	20+80=100
OPL654	C	Recent Trends in Orthopedic Physiotherapy	4	–	–	4	20+80=100
<b>Audit Courses</b>							
OPP661	A	Clinical Training–IV	–	–	6	6	
OPD662	A	Dissertation	–	–	8	8	

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**B. Practical Examination–24 Credits**

Practical examination of 24 credits will be conducted at the end of 4<sup>th</sup> semester which includes patient evaluation and management, viva–voce etc.

**C. Dissertation – 24 Credits**

The topic of dissertation will be allocated in Second Semester and candidate will work for 2 semesters and submit a written thesis in 4<sup>th</sup> semester. The student will be awarded grade for the total number of credits earned in dissertation in II, III and IV semesters of study at the end of the IV semester.

***Practical Attachments:***

To enable the students to acquire practicing in hand on skills, maximum emphasis will be laid on regular practical classes, demonstration and clinical practice. The students will undergo Clinical / Government Medical College Amritsar, and decided by BOC.

\* The credits earned by a candidate in practical and dissertation during different semesters will be evaluated at the end of the 4<sup>th</sup> semester and the grade will be determined accordingly.

\* A candidate shall be required to maintain minimum of 5.00 SGPA at the end of each semester. A student getting ‘C’ or lower grade in any course in this discipline will be treated as having failed in that course and shall have to repeat the core/elective courses/or repeat/opt. another course in lieu of interdisciplinary/outside department course with approval of Board of Control, and will have to obtain at least ‘B’ grade in that course within specified period as per the prevailing rules. The weights of ‘C’ and lower Grades will not be counted in SGPA or CGPA.

\*\* Interdisciplinary/Optional Course: to be offered from outside the department.

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – I)**  
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**OPL501: BASIC MEDICAL SCIENCES & CONDITIONS**

**L T P**  
**4 0 0**

**Max. Marks: 100**  
**Internal: 20**  
**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section-A**

**Applied Anatomy: A Review**

1. A review of organization and regulation of motor system.
  - a) Types of movement and factors affecting contact and range of motion at synovial joints
  - b) Skeletal muscle fibers: composition, structure and characteristics
  - c) Muscle metabolism
  - d) Contraction and relaxation of muscle
  - e) Control of muscle tension
2. Anatomy of certain diseases
  - a. Common dislocations
  - b. Low back pain
  - c. Sciatica
  - d. Lesions of inter-vertebral disc
  - e. Anatomical and Physiological loss resulting from nerve injury.
  - f. Peripheral nerve entrapment(such as carpal tunnel syndrome, cubital tunnel syndrome, tarsal tunnel syndrome, morton neuroma)
  - g. Spinal infection

**Section-B**

**Applied Physiology**

**1. Blood**

- a. The various components of blood
- b. Viscosity correlation
- c. Oxyhemoglobin Dissociation curves
- d. Interrelationship between pressure flow and resistance

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**2. Cardiovascular system**

- a) Cardiac cycle
- b) Cardiac output and its regulation
- c) Cardiac output in normal stress conditions
- d) Methods of measuring cardiac output
- e) Oxygen demand theory of local blood flow circulation
- f) Mechanisms of arterial pulse regulation
- g) Hypertension
- h) Normal coronary blood flow along with variations
- i) The cardiac reserve
- j) Physiological causes of shock

**Section-C**

**Respiratory system:**

- a. Review of mechanics of respiration
- b. Pulmonary volumes and capacities
- c. Transport of oxygen in blood
- d. Carbon dioxide in blood
- e. Regulation of respiration
- f. Respiratory abnormalities Hypoxia, Hypercapnoea, Hypocapnoea
- g. Artificial respiration
- h. Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea
- i. Respiratory changes during exercise.

**Section-D**

**Endocrine system:**

Physiology of the endocrine glands – Pituitary, Pineal Body, Thyroid, Parathyroid, Adrenal, Thymus, Pancreas, Testes & Ovary. Hormones secreted by these glands, their classifications and functions.

**References:**

1. Synopsis of Surgical Anatomy – John Wright & Sons, Bristol 1970 ed.
2. Gray's Anatomy - Williams & Warwick - Churchill Livingstone. 35<sup>th</sup> ed. 2007
3. Clinical Anatomy for Medical Students - Snell – Lippincott. 6<sup>th</sup> ed., 2000
4. Textbook of Medical Physiology - Guyton - Mosby. 10<sup>th</sup> Ed 2000
5. Pathologic Basis of Diseases - Robbins, Kotran and Kumar – W.B. Saunders. 7<sup>th</sup> ed, 2004
6. Pathology implications for Physical Therapists - Goodmann & Boissonnault- W. B. Saunders. 1999
7. Tureks – Orthopedics - Weinsteil & Buckwalter - Lippincott Publications.2004

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – I)**  
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**OPL502: HUMAN KINESIOLOGY**

**L T P**  
**4 0 0**

**Max. Marks: 100**  
**Internal: 20**  
**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

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**Section-A**

1. Definition, aims, objectives and role of Kinesiology in physiotherapy.
2. Review of fundamental concepts (applied aspect), Centre of gravity, Line of gravity, Planes, Lever system in Body, Fundamental starting positions.

**Section-B**

1. Frame work and joints of the body: Classification of the muscles and their structure, functions and role.
2. Types of Muscle contractions (Static, Concentric and Eccentric), Two joint Muscles, Angle of pull, Role of Gravity affecting muscular action.

**Section-C**

1. Physical Properties of bone, cartilage and muscle and their functional adaptation in various conditions.
2. Joints: Definition and Classification of joints- Shoulder, Elbow, wrist joint, Hip, Knee, Ankle, Inter-vertebral joints, small joints of hand and foot.
3. Origin, insertion, nerve supply and action of all important muscles related to human movement.

**Section-D**

1. Motion, type of motion, Distance and speed, Displacement and velocity, Acceleration, Angular distance and Angular displacement, Angular Speed, Angular Velocity, Angular Acceleration, Inertia, mass, weight, Newton's Laws of motion, Sections in linear and angular motion.
2. Force and its characteristics, internal and external forces, Classification of force system, Composition and resolution of forces. Friction, impact, elasticity, principles of spin and rebound, Eccentric forces, Moment, Principles of Lever, Rotatory force, Gravity, Methods of finding centre of gravity, Principles of Equilibrium, principles of projectile.

**References**

1. Brunnstrom - Clinical Kinesiology, F.A. Davis. 4<sup>th</sup> Ed, 2003
2. Rasch and Burk: Mishra: Clinical Neurophysiology, B.I. Churchill Livingstone. 3<sup>rd</sup> Ed.
3. Kinesiology and Applied Anatomy, Lee and Fabiger. 2002
4. White and Punjabi - Biomechanics of Spine - Lippincott. 2<sup>nd</sup> Ed, 1995.
5. Kapandji: Physiology of Joints Vol. I, II & III, W.B. Saunders, 2007.
6. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis, 2001

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – I)**  
(Credit Based Evaluation and Grading System)

**OPL503: ASSESSMENT & DIAGNOSIS OF ORTHOPEDIC CONDITIONS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

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**Section-A**

1. **Importance of assessment & evaluation in orthopedic condition.** Methods of evaluation: Clinical Examination, Reliability & Validity of the tests, Investigative Procedures.
2. **Musculoskeletal examination:** special tests, Posture, Gait, etc.

**Section-B**

**Assessment of upper extremity parts:**

- a) Shoulder complex
- b) Elbow
- c) Forearm
- d) Wrist and
- e) Hand

**Section-C**

**Assessment of lower extremity parts:**

- a) Pelvis
- b) Hip
- c) Thigh
- d) Knee
- e) Leg
- f) Ankle and
- g) Foot

**Section-D**

**Assessment of Vertebral column:**

- a) Cervical region
- b) Thoracic region
- c) Lumbo-sacral region
- d) Sacro-iliac region



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***References:***

1. Orthopaedic Physical Assessment David J Magee, Saunders
2. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Jaypee brothers.
3. Manual Examination and Treatment of the Spine and Extremities, Carolyn Wadsworth, Williams and Wilkins.
4. Clinical Orthopaedic Examination, Mc Rae, Churchill Livingstone.
5. Illustrated Orthopaedic physical Assessment, Ronald C Evans, Mosby.
6. Physical Examination of the Spine and Extrimities, Stenley, Lipenfield.
7. Norkin & White: Measurement of Joint Motion – A Guide to Goniometry - F.A. Davis. 2<sup>nd</sup> Ed.

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – I)**  
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**OPL504: RESEARCH METHODOLOGY & BIOSTATISTICS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

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**Section-A**

Research Methodology:

1. Introduction
  - a. Importance of research in clinical practice
  - b. Scientific approach
  - c. Characteristics
  - d. Purposes and limitations.
2. Ethical issues in research.
3. Structure, formulation and implementation of a research project
4. Research questions
  - a. Selection and statement of problem
  - b. Literature review
  - c. Meta-analysis.

**Section-B**

1. Types of research
  - a. Basic and Applied
  - b. Qualitative & Quantitative
  - c. Descriptive & Experimental
  - d. Longitudinal & Cross-sectional
2. Experimental Research
  - a. Types of Sampling
  - b. Variables
  - c. Experimental design
  - d. Factorial design

**Section-C**

Survey research:

- a. Conducting a survey
- b. Questionnaires
- c. Steps in conducting survey research
- d. Epidemiological research

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**Section-D**

Biostatistics

- a. Mean, Mode, Median
- b. Standard deviation
- c. Correlation and regression
- d. ANOVA and its application
- e. Validity and reliability
- f. Parametric (Student ‘t’ test, Paired ‘t’ test, Probability)
- g. Non-parametric statistics (Chi square test, Wilcoxon’s signed rank test)
- h. Sample size determination

***References***

1. Mohsin S.M.: Research Methods in Behavioral Sciences: Orient Publications. 2<sup>nd</sup> Ed.
2. Colton: Statistics in Medicine, Little Brown Company, Boston. 3<sup>rd</sup> Ed.
3. Mahajan: Methods in Biostatistics, Jay Pee Brothers. 3<sup>rd</sup> Ed., 2002
4. Vincent: Statistics in Kinesiology, Human Kinetics. 3<sup>rd</sup> Ed., 2005
5. Hicks: Research for Physiotherapists, Churchill Livingstone. 2<sup>nd</sup> Ed., 1995

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – II)**  
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**OPL551: APPLIED CLINICAL SCIENCES**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section-A**

1. Cell injuries: - Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure, Reversible cell injury, Irreversible cell injury, Pathologic calcification.
2. Inflammation

**Section-B**

1. Repair, wound healing by primary and secondary union, factors promoting and delaying the process. Healing in specific site including bone healing. "Failed" healing responses.
2. Repair of soft tissue injuries.
3. Principles of drug action.
4. Basic pharmacokinetics and Pharmacodynamics.

**Section-C**

1. The use of drugs in various musculoskeletal disorders.
2. The use of drugs in various cardiovascular disorders.
3. The use of drugs in various neurological disorders.
4. The use of drugs in various Respiratory disorders.

**Section-D**

1. Basics of radiology including ultrasonography, X-ray, CT & MRI scanning
2. Imaging of the head and neck.
3. Imaging of spine.
4. Imaging of thorax and abdomen.
5. Imaging of upper extremity.
6. Imaging of lower extremity.

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***References:***

1. The Pharmacological Basis of Therapeutics - Goodman and Gilman - MacMillan. 11<sup>th</sup> Ed.
2. Pharmacology and Pharmacotherapeutics - Satoskar & Bhandarkar - Popular Publications - Bombay. 17<sup>th</sup> Ed.
3. Davidsons – Principles and Practice of Medicine- Edward - Churchill Livingstone. 8<sup>th</sup> Ed.
4. Systems of Orthopedics - Apleys - Butterworth Heinmann. 13<sup>th</sup> Ed.
5. Outline of Orthopedics - Adams - Churchill Livingstone. 11<sup>th</sup> Ed.
6. Outline of Fractures - Adams - Churchill Livingstone. 11<sup>th</sup> Ed.
7. Tureks – Orthopedics - Weinsteil & Buckwalter - Lippincott Publications, 2004.
8. Text Book of Radiology - Sutton D. - Churchill Livingstone. 7<sup>th</sup> Ed., 2002.

*MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – II)*  
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**OPL552: HUMAN BIOMECHANICS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

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**Section-A**

**Introduction to Human Biomechanics**

1. Mechanics - Definition of mechanics and Biomechanics
2. Principle of Biomechanics
3. Nature and importance of Biomechanics in Physiotherapy
4. Elasticity - Definition, stress, strain, HOOKE'S Law

**Section-B**

**Biomechanics of upper and lower extremities**

1. Biomechanics of shoulder motion
2. Biomechanics of elbow motion
3. Biomechanics of wrist and hand motion
4. Biomechanics of pelvic motion
5. Biomechanics of hip motion
6. Biomechanics of knee motion
7. Biomechanics of ankle & foot motion

**Section-C**

**Biomechanics of spinal region**

1. Biomechanics of cervical region
2. Biomechanics of thoracic region
3. Biomechanics of lumbosacral region
4. Biomechanics of sacroiliac joint

**Section-D**

**Posture & Gait**

1. Posture – dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.
2. Gait – kinematics and kinetics of gait, Biomechanics of running and stair climbing.

***References:***

1. Brunnstrom - Clinical Kinesiology, F.A. Davis. 5<sup>th</sup> Ed.
2. White and Punjabi - Biomechanics of Spine - Lippincott. 2<sup>nd</sup> Ed, 1995.
3. Norkin & Levangie: Joint Structure and Function - A Comprehensive Analysis - F.A. Davis, 2001.
4. Nordin & Frankel - Basic Biomechanics of Muscular Skeletal System - Williams & Wilkins, 2<sup>nd</sup> Ed. 2001.
5. Koley – Textbook of Biomechanics, AITBS Publishers, India, 2019.

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – II)**  
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**OPL553: BASIC PHYSIOTHERAPY METHOD**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

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**Section-A**

1. Define Rehabilitation, Goals and Objectives of Rehabilitation, multidisciplinary approach of rehabilitation.
2. Modern concepts in rehabilitation.
3. Definition, details of effects and uses of therapeutic exercises.
  - a. Dynamic Exercises
  - b. Isokinetic Exercises
  - c. Isometric and Isotonic Exercises
  - d. Kinetic chain exercises

**Section-B**

1. Stretching
2. Balance and coordination exercises
3. Factors affecting the joint range of motion prevention of stiffness, methods of joint mobilization.
4. Causes of muscle weakness, Prevention of disuse atrophy, Principles of treatment to increase muscle strength and function.
  - a. Techniques of strengthening with respect to regional consideration.
  - b. Various methods of progressive resisted exercise.

**Section-C**

1. Principles and application of neuromuscular facilitation techniques including PNF
2. Principles of different soft tissue mobilizations(such as Myofascial Techniques)
3. Neural Tissue Mobilization
4. Methods for improving neuromuscular control, proprioception and Kinesthetic sensation following different injuries.



**Section-D**

1. Muscle Energy Technique
2. Concept of group therapy.
3. Physiotherapy – Ethics & Medico legal aspects.

***References:***

1. Gardiner M. Dena: The Principles of Exercise Therapy - CBS Publishers, Delhi, 3<sup>rd</sup> Ed.
2. Kisner and Colby: Therapeutic Exercises – Foundations and Techniques, F.A. Davis, 5<sup>th</sup> Ed.
3. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins, 2004.
4. Thomson et al - Tidy's Physiotherapy: Butterworth – Heinmann, 13<sup>th</sup> Ed.
5. Kendall: Muscles – Testing and Function - Williams & Wilkins, 4<sup>th</sup> Ed.
6. William E. Prentice: Rehabilitation Techniques – Mosby, 4<sup>th</sup> Ed, 2003.
7. Norkin & White: Measurement of Joint Motion – A Guide to Goniometry - F.A. Davis, 2002.
8. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications, W.B. Saunders, 2004.
9. Voss et al - Proprioceptive Neuromuscular Facilitation - Patterns & Techniques - Williams & Wilkins, 2<sup>nd</sup> Ed, 2004.

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – II)**  
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**OPL554: PHYSIOTHERAPY IN TRAUMATIC ORTHOPEDIC CONDITIONS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

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**Section-A**

1. Causes & Mechanism of Musculoskeletal Injuries and preventive measures.
2. Common fracture and dislocation of upper extremities

**Section-B**

1. Common fracture and dislocation of Lower extremities
2. Common fracture and dislocation of spine

**Section-C**

1. Common acute and overuse injuries of soft tissues.
2. Fracture management- First-aid and advance action.
3. Rehabilitation of fracture.

**Section-D**

Amputation- Types, Levels & procedures.  
Pre and post operative rehabilitation.  
Prosthesis and stump care.

**References:**

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

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – III)**  
(Credit Based Evaluation and Grading System)

**OPL601: ADVANCED PHYSIOTHERAPY METHODS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Introduction to manual therapy
  - a. Joint techniques
  - b. Manual joint therapy
  - c. Traction Principles
  - d. Basic principles of manipulation for various disorders of the spine and extremities.

**Section- B**

1. Biophysics, Physiological effects, indications, contraindications and specific uses in Physiotherapy of the following equipments:- such as Infrared rays, Paraffin Wax Bath, Moist Heat Pack, Fluidotherapy, LASER, UVR.
2. **Massage:** - Definition and classification of massage techniques, Physiological effects of massage, Connective tissue massage, therapeutic applications and contraindications of massage.

**Section- C**

1. **Hydrotherapy-** Physiological Effects, raising temperature baths, baths with additives, whirl pool bath. Rehabilitation approach using hydrotherapy.
2. **Cryotherapy-** Physiological effects, Use of cold therapy in acute phase, rehabilitative phase, preventive phase of injury, Methods of application, Indications and contraindications.

**Section- D**

**Electrotherapy approach-**

1. Principles underlying the application of following modalities with reference to their production, biophysical and therapeutic effects, indications and contraindications and the specific uses in Physiotherapy.
  - a. Low Frequency Current: Direct Current Modified Direct Current, Alternative Current, Diadynamic Current, Iontophoresis, TENS, High Voltage, Pulsed Galvanic Stimulation.
  - b. Medium Frequency Current: IFT, Russian Currents.
  - c. High Frequency Currents: SWD, MWD, Ultrasound.

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***Practical:***

1. The students will undergo clinical training in the Health Centre on various apparatus of physiotherapy. This training will constitute major part of the practical examination.

***References:***

1. A.G. Sinha, Principle and Practices of Therapeutic Massage. Jaypee Brothers, New Delhi, 2001.
2. William E. Prentice: Rehabilitation Techniques – Mosby, 4<sup>th</sup> Ed.
3. O' Sullivan, Schmitz: Physical Rehabilitation – Assessment and Treatment - F.A. Davis, 4<sup>th</sup> Ed, 2006.
4. John Low & Reed: Electrotherapy Explained, Butterworth, 4<sup>th</sup> Ed, 2006.
5. Meryl Roth Gersh: Electrotherapy in Rehabilitation, FA Davis, 3<sup>rd</sup> Ed.
6. Joseph Kahn: Principles and Practice of Electrotherapy, Churchill Livingstone, 3<sup>rd</sup> Ed.
7. Claytons Electrotherapy - Sarah & Bazin - W.B. Saunders, 12<sup>th</sup> Ed.
8. Nelson and Currier: Clinical Electrotherapy, Prentice Hall, 3<sup>rd</sup> Ed.
9. Greenman: Principles of Manual medicine, William and Wilkins, 3<sup>rd</sup> Ed.
10. Michlovitz - Thermal agents in Rehabilitation - F.A. Davis, 1996.
11. Lehmann - Therapeutic Heat and Cold - Williams & Wilkins, 4<sup>th</sup> Ed, 1990.

*MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – III)*  
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**OPL602: ANTHROPOMETRY**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Role of anthropometric knowledge in Physiotherapy.
2. Age determination: -Skeletal age, Dental age.

**Section- B**

1. Body measurements
  - a. Gross size and mass
  - b. Lengths or heights of body parts
  - c. Circumstances of body parts
  - d. Skinfold thickness

**Section- C**

1. Anthropometric study group measurements
  - a. Planes of the body
  - b. Axes of the body
  - c. Landmarks on the body
2. Body composition
  - a. Different Body composition
  - b. Various methods to estimate body composition
    - i. Anthropometric determination of the body composition (skinfold thickness)
    - ii. Application of surface anthropometry (the body profile)

**Section- D**

1. Somatotyping

- a. Sheldon's method of somatotyping
  - i. Critical evaluation of Sheldon's method of somatotyping
- b. Heath – Carter method of somatotyping
  - i. The rating scales
  - ii. Anthropometric measurements
  - iii. First, Second and Third Components
  - iv. Somatotype distribution

***References:***

1. Ostym, Beunen and Simons: Kinanthropometry II, University Park Press, Baltimore, 1998.
2. James A.P. Day: Perspectives in Kinanthropometry, Human Kinetics Publishers, Inc. Champaign, Illinois, 1998.
3. Koley S., Textbook of Kinanthropometry, AITBS Publishers, India, 2018
4. Singh and Malhotra: Kinanthropometry, Lunar Publications, 3<sup>rd</sup> Ed.
5. Verma and Mokha: Nutrition, Exercise and Weight Reduction, Exercise Science Publication Society, 3<sup>rd</sup> Ed.

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**OPL603: WORK PHYSIOLOGY**

**L T P**  
**4 0 0**

**Max. Marks: 100**  
**Internal: 20**  
**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. **Nutrition**
  - a. Carbohydrates, Fats, Proteins.
  - b. Vitamins, Minerals and Water.
  - c. Optimal Nutrition for Physical activity.
2. **Energy Transfer in Physical activity:**
  - a. Energy transfer in Body.
  - b. Energy transfer in exercise.
  - c. Energy expenditure during various activities.
  - d. Fatigue.

**Section- B**

1. **Cardiovascular adaptation to exercise:**
  - a. Cardiovascular adaptations to sustained aerobic exercises.
  - b. Coronary heart disease, exercise and optimization of lipid profile.
  - c. Regulation of circulation during exercise.
  - d. Circulatory responses to various types of exercise regulation of cardiovascular system during exercise.

**Section- C**

1. **Respiratory responses to exercise:**
  - a. Regulation of Respiration during exercise.
  - b. Ventilation at Rest and during Exercise.
  - c. Ventilation and the Anaerobic Threshold.
  - d. Static and dynamic lung volume.
  - e. Adaptive changes in the respiratory systems due to regular physical activities .

**Section- D**

**1. Musculoskeletal responses to exercises:**

- a. Growth and Exercise.
- b. Training for Muscular Strength and Endurance.

**2. Endocrine system responses to exercise:**

- a. Effects of exercise on various Hormones in the body.
- b. Hormone regulation of fluid and electrolytes during exercise.
- c. Exercise and Menstrual Cycle.

***References***

- 1. Mc Ardle, Katch, Katch: Exercise Physiology, 5<sup>th</sup> Ed.
- 2. George A. Brooks, Thomas D. Fahey: Exercise Physiology – Human Bioenergetics and its applications 1984, John Wiley & Sons, New York, 4<sup>th</sup> Ed.
- 3. Astrand & Rodahl: Text Book of Work Physiology, McGraw Hill, 2003.
- 4. Fox and Mathews - The Physiological Basis of Physical Education and athletics - Holt Saunders, 4<sup>th</sup> Ed.
- 5. Koley – Essentials of Exercise Physiology, Jaypee Brothers, New Delhi, 2018
- 6. Levick, J.R. (1998) An introduction to Cardiovascular Physiology. 2nd ed. Butterworth Heinemann



**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – III)**  
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**OPL604: PHYSIOTHERAPY IN NON-TRAUMATIC ORTHOPEDIC CONDITIONS**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Metabolic bone disorders - Rickets, Osteomalacia, Osteoporosis and Scurvy.
2. Congenital disorders
  - a. Congenital Torticollis
  - b. Congenital Talipes Equinovarus (CTEV)
  - c. Developmental dysplasia of hip (DDH)
3. Skeletal Tuberculosis: - Spine, Hip, Knee

**Section- B**

1. Joints Disorders
  - a. Arthritis
  - b. Infective Arthritis
  - c. Septic Arthritis
  - d. Charcot's joints
  - e. Hemophilic arthritis
  - f. Syphilis of joints
2. Rheumatic diseases
  - a. Rheumatic Arthritis
  - b. Ankylosing Spondylitis
3. Degenerative diseases

**Section- C**

1. Miscellaneous Conditions:- Osteoarthritis of Hip and Knee, Gout, Pseudo-gout.
2. Common bone neoplasias.

**Section- D**

Regional Orthopedics condition:- Torticollis, Thoracic outlet syndrome, Impingement Syndromes, Coxa vara, Coxa valga, Genu Valgum, Genu Varum, Genu recurvatum, Pes Cavus, Pes Planus, Painful heel conditions.

*MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – III)*  
*(Credit Based Evaluation and Grading System)*

***References:***

1. Clinical Orthopedic Rehabilitation, Brent Brotzman.
2. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
3. Tidy's Physiotherapy, Ann Thomasons ,Varghese publishing House.
4. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers
5. Textbook of Orthopedics, John Ebnezar, Japee Brothers.
6. Treatment and Rehabilitation of fractures,S Hoppenfield, Vasantha LM;Lippincott William and Wilkins.
7. Hand practice , Principle and Practice, Mauren Salter, Butterworth Heinemann.
8. Essentials of Orthopaedics and Applied Physiotherapy , Jayant Joshi,prakash Kotwal; Churchill Livingstone.
9. Turek's Orthopedics: Principles and their Application , Weinstein SL and Buckwalter JA, Lippincott
10. K. Park: Preventive and Social Medicine - Banarsi Dass Bhanot – Jabalpur, 11<sup>th</sup> Ed.

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – IV)**  
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**OPL 651: SPINAL & PERIPHERAL ORTHOPEDIC PHYSIOTHERAPY**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Review of anatomy and pathomechanics of vertebral column
2. Congenital disorders of vertebral column
3. Acquired deformities of vertebral column

**Section- B**

1. Traumatic injuries of vertebral column: General & regional
2. Spinal cord injuries:- Types, Classifications, Examination & Management.

**Section- C**

1. Review of anatomy and pathomechanics of Upper extremity.
2. Common musculoskeletal conditions of Shoulder joint:- Frozen shoulder, Subscapularis tendinitis, Supraspinatus tendinitis, Infraspinatus tendinitis, Rotator cuff injury.
3. Common musculoskeletal conditions of Elbow joint:- Tennis elbow, Golfer's elbow, Olecranon bursitis, Cubital varus & valgus deformity, Mayositis ossificans.
4. Common musculoskeletal conditions of wrist and hand complex:- De Quervain's disease, Trigger finger, Dupuytren's contracture, Carpal tunnel syndrome, Kienbock's disease.

**Section- D**

1. Review of anatomy and pathomechanics of Lower extremity.
2. Common musculoskeletal conditions of Hip joint:- Perthes' disease, Heterotrophic ossificans, Avascular necrosis, Femoro-acetabular impingement, Retroversion & antiversion.
3. Common musculoskeletal conditions of Knee joint:- Ligament sprains, Pattelo-femoral pain, Recurrent dislocation of patella, Chondromalacia patellae, Osgood-shlatter's disease.
4. Common musculoskeletal conditions of Ankle & foot joint:- Fat-pad syndrome, Calcaneal spur, Planter-fasciatis, Achilies tendinopathies.

***Practicals:***

1. Students will undergo practical training at GNDU Campus, Amritsar.

***References:***

1. Clinical Orthopedic Rehabilitation, Brent Brotzman.
2. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
3. Tidy's Physiotherapy, Ann Thomasons, Varghese publishing House.
4. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Jaypee brothers
5. Textbook of Orthopedics, John Ebnezar, Japee Brothers.
6. William E. Prentice: Rehabilitation Techniques – Mosby

**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – IV)**  
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**OPL652: PHYSIOTHERAPY APPROACH TO GAIT & POSTURE**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Anatomical and kinesiological basis of posture
2. Biophysics of posture
3. The nervous & musculoskeletal system in posture

**Section- B**

1. Postural disorders of spine, such as Kyphosis, lordosis, scoliosis, flat back, round back.
2. Parameters used to determine postural disorders of spine
3. Diagnosis and management of postural disorders of spine
4. Postural disorders of upper extremities

**Section- C**

1. Postural disorders in lower extremities: Pes planus, Pes varus, Pes cavus, Tibial tarsion, Genu recurvatum, Genu varum, Genu valgum, Coxa varum, coxa valgum, femoral anteversion, femoral retroversion.
2. Parameters used to determine postural disorders of lower extremity
3. Diagnosis and management of postural disorders of lower extremity

**Section- D**

1. Introduction to human gait cycle, Forces responsible for gait.
2. Identification of functional Gait disorders
3. Gait analysis system
4. Correction of gait disorders

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*(Credit Based Evaluation and Grading System)*

***References:***

1. Gait analysis- An Introduction, Michael W. Whittle 4<sup>th</sup> ed
2. Dynamics of Human Gait, Christopher L Vaughan, Brian L Davis.
3. Gait Disorders Evaluation and Management, Jeffrey M. Hausdorff, Neil B. Alexander.
4. Clinical disorder of Balance, Posture and Gait, Adolfo M. Bronstein, Thomas B.
5. Gait Analysis Normal and Pathological Function, Jacquelin Perry.
6. Muscles Testing and Function with Posture and Pain, Florence Peterson Kendall, Elizabeth Kendall McCreary
7. Clinical Orthopedic Rehabilitation, Brent Brotzman.
8. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
9. Physical Rehabilitation Assessment and Treatment, Susan O Sullivan, Jaypee brothers
10. William E. Prentice: Rehabilitation Techniques – Mosby.

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**OPL653: ORTHOPEDIC REHABILITATION & ETHICAL PRINCIPLES**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation.
2. Locomotors disability, impact of disability on individual, family, and society.
3. Preventive aspects of disability
4. Rehabilitation: Such as institutional based rehabilitation, outreach programs, Community based rehabilitation.

**Section- B**

1. The principles and methods of vocational and social rehabilitation
2. Architectural Barriers: Describe architectural barriers and possible modifications with reference to various orthopedic conditions.
3. The principles and process of disability evaluation.
4. Activities of Daily Living (ADLs).

**Section- C**

1. General Principles of Orthotics- classification, indications, contraindications, disadvantages and uses according to various regions.
  - a. Orthotics for the Neck and Spine
  - b. Orthotics for the Upper Limb
  - c. Orthotics for the Lower Limb
2. General Principles of Prostheses- classification, indications, contraindications, disadvantages and uses according to various regions.
  - a. Prosthetics for the Upper Limb
  - b. Prosthetics for the Lower Limb

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**Section- D**

1. Various legal Acts: PWD act, RCI act.
2. Professional ethics for Physiotherapist:
  - a. Concept of Morality, Ethics and Legality
  - b. Professionalism
  - c. Sexual and Physical Abuse
  - d. Social characteristics and Personal relationships
  - e. Professional issues
  - f. Client interest and satisfaction
  - g. Confidence and communication
  - h. Malpractice
  - i. Negligence
  - j. Rights of patients
  - k. Status of physiotherapist in health care

***References:***

1. Clinical Orthopedic Rehabilitation, Brent Brotzman.
2. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
3. Physical Rehabilitation Assessment and Treatment, Susan O Sullivan, Jaypee brothers.
4. Textbook of Rehabilitation, S Sunder, Jaypee Publications.
5. William E. Prentice: Rehabilitation Techniques – Mosby.



**MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – IV)**  
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**OPL654: RECENT TRENDS IN ORTHOPEDIC PHYSIOTHERAPY**

**L T P**  
**4 0 0**

**Max. Marks: 100**

**Internal: 20**

**External: 80**

**Mid Semester Examination: 20% Weightage**

**End Semester Examination: 80% Weightage**

**Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section- A**

1. Manual Therapy: Introduction, Classification, Assessment for mobilization and manipulation. The concepts of mobilization, such as:
  - a. Maitland
  - b. Cyriax,
  - c. Kaltenborn
  - d. Mennel
  - e. Mulligan
  - f. McKenzie

**Section- B**

1. Pain: Assessment & management
2. Butler mobilization of nerves
3. Review of Special tests for various joints

**Section- C**

1. Myofascial Release: Concept & brief discussion of its application technique
2. Muscle Energy Techniques
3. Positional release technique
4. Principles of Taping and application- Rigid & Dynamic Taping

**Section- D**

1. Segmental Stabilization Concepts of Spine:
  - a. Muscle function in spinal stabilization
  - b. Contribution of various muscles to spinal stabilization
  - c. Local Muscle dysfunction in Low back pain
  - d. Principles of clinical management of deep muscle system for segmental Stabilization.

*MASTERS IN PHYSIOTHERAPY (ORTHOPEDICS) (SEMESTER – IV)*  
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***References:***

1. Clinical Orthopedic Rehabilitation, Brent Brotzman.
2. Orthopedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
3. Physical Rehabilitation Assessment and Treatment, Susan O Sullivan, Jaypee brothers
4. Therapeutic Exercise for Spinal Segmental Stabilization in Low back Pain, C. Richardson, G. Jull, Churchill Livingstone.
5. William E. Prentice: Rehabilitation Techniques – Mosby.