



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PHYSIOTHERAPY

**MASTER OF PHYSIOTHERAPY
(MPT)
NEUROLOGY**

SYLLABUS

YEAR/ SEMESTER: I/I



Integral University, Lucknow
Department of Physiotherapy
Study and Evaluation Scheme

Program: MPT

Semester I

S. No.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Max. Marks	Credit	Total Credits
				L	T	P	CT	T A	Total	ESE			
THEORIES													
1	PT501	Basic Health Science	DE	03	01	0	40	20	60	40	100	3:1:0	4
2	PT502	Advanced Electrotherapy and Electro diagnosis	Core	03	01	0	40	20	60	40	100	3:1:0	4
3	PT503	Research Methodology, Biostatistics	Core	03	01	0	40	20	60	40	100	3:1:0	4
4	PT504	Exercise Testing & Prescription	Core	03	01	0	40	20	60	40	100	3:1:0	4
5	PT505	Seminar on Clinical Issues	Core	00	03	0	50	50	100	00	100	0:3:0	3
PRACTICAL													
1.	PT506	Clinical Training	Core	00	00	14	50	50	100	00	100	0:0:7	7
Total				12	07	14	260	180	440	160	600	26	26

Program: MPT

Semester II

S. No.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Max. Marks	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	PT507	Medical & Surgical Condition	DE	03	1	0	40	20	60	40	100	3:1:0	4
2	PT508	Biomechanics and Kinesiology-I	Core	03	1	0	40	20	60	40	100	3:1:0	4
3	PT509N	Physiotherapy-I	Core	03	1	0	40	20	60	40	100	3:1:0	4
PRACTICAL													
1.	PT510	Biomechanics and Kinesiology-I Lab	DE	00	00	02	50	50	100	00	100	0:0:1	1
2.	PT511N	Physiotherapy -I Lab	DE	00	00	02	40	20	60	40	100	0:0:1	1
3.	PT512	Seminar on Clinical Issues	Core	00	03	0	50	50	100	00	100	0:3:0	3
4.	PT513	Clinical Training	Core	00	00	14	50	50	100	00	100	0:0:7	7
Total				9	06	18	310	230	540	160	700	24	24



Integral University, Lucknow

Effective from Session: 2020-2021										
Course Code	PT501	Title of the Course	BASIC HEALTH SCIENCES				L	T	P	C
Year	I	Semester	I				3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil							
Course Objectives	Student will learn the principles, technique, and effects of different concepts of anatomy, physiology, pathology, pharmacology & radiology in the restoration of basic knowledge and also implementation of evidence based practical approach.									

Course Outcomes	
CO1	To provide the basic understanding of different Musculoskeletal structure like bone, muscles ligament and its microscopic structural design and differences and importance.
CO2	To making the students able to understand about the smallest functional unit of the human body, its electrophysiological response and membrane potential.
CO3	Making the students about the pathophysiological response of the body and mechanism action of immune system in different pathological condition.
CO4	The objective of this unit is to make the students able to understand about the pharmacokinetics and Pharmacodynamics response of different drugs and its uses and side effect.
CO5	To provide the optimal knowledge of different imaginary tool which is used to rule- out different anomalies related to musculoskeletal system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	ANATOMY	1. Micro structure for various soft tissue structures like Ligaments, Muscle, bone, cartilage, articular cartilage tendon and disc. 2. Embryology (ossification of various bones). 3. Musculoskeletal anatomy of human body. 4. Joints and Its Classification	8	CO1
2	PHYSIOLOGY	1. Cell and its function. 2. Electrophysiology, Membrane potential. 3. Muscle Physiology, Contraction of skeletal muscle. 4. Effects of ageing.	8	CO2
3	PATHOLOGY	1. Immune system: Immune response, immunology and exercise, autoimmune diseases, isoimmune diseases. 2. Oncology. 3. Response to trauma, specific tissue injury. 4. Metabolic disorders. 5. Tuberculosis–musculoskeletal.	8	CO3
4	PHARMACOLOGY	1. Pharmacokinetics and Pharmacodynamics. 2. Anti-Anaemic, 3. Hormones, 4. Insulin, 5. Steroids, 6. Diuretics	8	CO4
5	RADIOLOGY	Basics of Imaging Techniques in Orthopaedic conditions 1. Ultrasonography, 2. X-rays, 3. CT Scan, 4. MRI scanning, 5. Bone Scan, 6. Dexa Scan	8	CO5

Reference Books:	
1. Gray's Anatomy	
2. Pharmacology in Rehabilitation. Ciccone	
3. Clinical Anatomy – Snell	
4. Boyd's Textbook of Pathology – A.C. Ritchie	
5. Textbook of Medical Physiology - Guyton - Mosby.	
6. Pathologic Basis of Diseases - Robbins, Kotran and Kumar - W.B. Saunders.	
e-Learning Source:	
1. https://youtu.be/Bt0aaxpDlTd8	
2. https://youtu.be/Bt0aaxrpDlTd8	
3. https://youtu.be/hpwennlr-ZHB0	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO																
CO1	3	2	-	-	-	1	1	-	1	-	-	-	3	3	1	1	-
CO2	3	3	-	-	-	1	1	-	1	-	-	-	3	3	1	1	-
CO3	3	3	3	1	2	2	1	1	1	-	-	-	2	3	1	1	-
CO4	-	-	2	-	2	2	2	-	-	-	-	-	1	2	2	-	-
CO5	2	3	3	1	3	3	1	-	-	-	-	1	3	3	2	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
PT501	Basic health sciences	√	√	√				√	√	3,4



Integral University, Lucknow

Effective from Session: 2015-2016

Course Code	PT502	Title of the Course	ADVANCED ELECTROTHERAPY AND ELECTRODIAGNOSIS	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Student will learn the principles, technique, and effects of different electrotherapeutic and electro diagnostic modality in the restoration of physical function, its clinical implication and evidence based practical approach.						

Course Outcomes

CO1	To understand about different electrotherapy modalities and uses of current for treatment of neuromusculoskeletal problem and its effect on different system.
CO2	To understand about the advancement of electrotherapy and its effect on neuromusculoskeletal and musculoskeletal rehabilitation.
CO3	To understand about different electrotherapy modalities which are used for diagnose and treat the problem related to the neuromusculoskeletal.
CO4	To deals with the recent advances which occur in electrotherapy like extracorporeal shock wave therapy and its future prospective.
CO5	To understand about the recent advances in electrotherapeutic modalities like pulsed and continuous diathermy, pulsed and continuous microwave diathermy, Ultrasonic Therapy, LASER, Thermotherapy, Cryotherapy, Infra-Red, etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	ELECTRO PHYSIOLOGY	1. Neurophysiology basis for application of therapeutic electricity. a) Nerve and muscle excitation induced by external applied stimulation b) Reflex activation and synaptic transmission, Excitation of alpha motor neurons. 2. Electrophysiology of pain and its management. Electrodiagnosis and electrotherapeutic instrumentation, Types of stimulation electrodes, Placement of electrodes Different components in diagnostic equipment's e.g., processor, amplifiers, processors, rectifiers, and display devices. Signal processor and amplification and filtering.	8	CO1
2	TENS ADVANCEMENT	1. Recent advances in application of TENS for neuromuscular and musculoskeletal rehabilitation. 2. Role of different electrotherapeutic modalities in management of pain and healing. Clinical decision making in the use of appropriate modality in neuromuscular, musculoskeletal, Neurological, cardiopulmonary, and sports conditions.	8	CO2
3	ELECTRO DIAGNOSIS	1. Electrical evaluation of nerve and muscle excitability. a) SD curve and chronaxie test b) Nerve conduction test Motor nerve conduction-Motor nerve conduction, Sensory nerve conduction, H-reflex response, Evoked potential tests (Somatosensory evoked potentials, Visual evoked potentials and Auditory evoked potentials) Electromyography and bio-feedback) Biophysical principles, Clinical considerations, Clinical application of musculoskeletal patients, Clinical application of neuromuscular patients. b) Role of E.M.G.B.F.B in sports training and rehabilitation. c) EMG- Normal, abnormal EMG and indications	8	CO3
4	ADVANCEMENT IN ELECTRICAL MODALITIES	1. Extracorporeal Shock Wave Therapy a) Biophysical and Biophysiological principals b) clinical application in musculoskeletal rehabilitation c) Future prospects of E.S.W.T. in musculoskeletal rehabilitation. 2. .F.E.S. in Rehabilitation a) Evidence based practice b) Clinical application 3. NMES and clinical applications: Disuse atrophy, ROM, Muscle re-education and facilitation, Spasticity management, Orthotic substitution, Gait training, Shoulder subluxation	8	CO4
5	ELECTRO THERAPEUTIC MODALITIES	1. Recent advances, critical evaluation and current status of different electrotherapeutic modalities like pulsed and continuous diathermy, pulsed and continuous microwave diathermy, Ultrasonic Therapy, LASER, Thermotherapy, Cryotherapy, Infra-Red, etc. In musculoskeletal, neuromuscular, sports and cardiovascular rehabilitation.	8	CO5

Reference Books:

1. Electrotherapy: Evidenced based Therapy by Sheila Kitchen.
2. Clinical Electrotherapy & Electrophysiological Testing by Andrew J Robinson.
3. Electrotherapy/; Evidenced based practice by Tim Watson.
4. Physical Agents in Rehabilitation – Cameron.

e-Learning Source:

1. <https://youtu.be/Bt0aaxpDITd8>
2. <https://youtu.be/Bt0axxrpDITd8>
3. <https://youtu.be/hpwnnlr-ZHB0>
4. <https://youtu.be/KHvfdKvw2I8>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	1	2	1	-	-	-	-	3	1	3	2	2
CO2	3	3	3	3	3	2	3	1	-	-	-	-	3	1	3	2	2
CO3	3	3	3	3	3	3	3	1	-	-	-	-	3	1	3	2	2
CO4	3	3	3	3	3	3	3	1	-	-	-	-	3	1	3	2	2
CO5	3	3	3	3	3	3	3	3	-	-	-	-	3	3	3	2	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
PT502	ADVANCED ELECTROTHERAPY AND ELECTRODIAGNOSIS	√	√	√				√	√	3,4,9



Integral University, Lucknow

Effective from Session: 2015-2016							
Course Code	PT503	Title of the Course	RESEARCH METHODOLOGY & BIostatISTICS	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Student will learn the research methodology, research problem, design, estimation and calculation of sample size, qualitative and research analysis, data analysis.						

Course Outcomes	
CO1	Outcome of this unit deals with the research methodology, research problem, design, measurement and scaling technique.
CO2	Outcome of this unit to making the students understands about research ethics, how to write a research proposal choosing and developing research question.
CO3	Outcome of this unit facilitates the students about writing thesis & journal article, presenting research and attending a scientific conference.
CO4	Outcome of this unit is to making students able about the processing and analysis of data and interpretation, testing of hypothesis etc.
CO5	Outcome of this unit is to making the students able about estimation and calculation of sample size, qualitative and research analysis, data analysis etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	RESEARCH	1. An introduction to research methodology. 2. Defining the research problem. 3. Review of literature/use of IT & Database for ROL. 4. Research Design–Experimental & Non-experimental. 5. Measurement and scaling techniques. 6. Methods of data collection. Sampling. 7. Level of evidence.	8	CO1
2		1. Research ethics. 2. Writing proposal, writing in scientific style. 3. Use of animals in research. 4. Critiquing article. 5. Choosing & Developing Research question. 6. Presenting research Proposal. 7. Applying for research funding.	8	CO2
3		1. Writing thesis & journal article. 2. Presenting research. 3. Attending a scientific conference. 4. Preparing a conference poster. 5. Guidelines for development/ refinement, evaluation and use of assessment tools (including attitude scales): scoring, administering tests & critiquing tools. Research in rehabilitation.	8	CO3
4	BIostatISTICS	1. Types of data, collection, representation, measure of central tendency, variation, and association. 2. Processing and analysis of data and Interpretation. 3. Testing of hypothesis (parametric or standard tests of hypotheses, non parametric or distribution-free tests). 4. Statistical analysis for differences and correlation: Basic, Advanced special technique. 5. Analysis of variance and covariance. 6. Multivariate analysis techniques.	8	CO4
5		1. Sample size estimation and power calculation. 2. Qualitative analysis. 3. Rasch analysis. 4. Software use for data analysis – STATA, SPSS etc. 5. Repertory grid analysis and its application to health care research. 6. Delphi technique (to arrive at a consensus of professional opinion on any given topic).	8	CO5

Reference Books:							
1. Handbook of Research in Physical Therapy, by C. E. Bork							
2. Physical Therapy Research: Principles and Application, by E. Domholdt							
3. Research Methodology for Physical Therapists, by C. Hicks							
4. Professionalism in Physical Therapy by Swisher							
5. Introduction to Research in Health Sciences, by Stephen Polgar							
e-Learning Source:							
5. https://youtu.be/Bt0aaxpDITd8							
6. https://youtu.be/Bt0aaxrpDITd8							
7. https://youtu.be/hpwmlr-ZHB0							
8. https://youtu.be/KHvfdKyw2I8							

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	2	2	2	2	3	3	3	-	2	-	2	1	3	3	3
CO2	1	1	2	2	2	2	3	3	3	-	2	-	2	1	3	3	3
CO3	1	1	2	2	2	2	3	3	3	-	2	-	2	1	3	3	3
CO4	1	1	2	2	2	2	3	3	3	-	2	-	2	1	3	3	3
CO5	1	1	2	2	2	2	3	3	3	-	2	-	2	1	3	3	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
PT503	RESEARCH METHODOLOGY & BIostatISTICS	√	√	√					4,9



Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	PT505	Title of the Course	SEMINAR ON CLINICAL ISSUES	L	T	P	C
Year	I	Semester	I	0	3	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	This course will serve as a platform for students to integrate various components of patient management and debate contentious issues in the efficacy of Physiotherapy techniques used in musculoskeletal, neurological, cardiopulmonary, & Sports rehabilitation as well as enhance presentation skills.						

Course Outcomes	
CO1	The students will understand and interpret latest advancements through different technical papers, reports, Journals, Data sheets, books etc
CO2	The students will inculcate the skills for literature survey and will learn to manage resources effectively.
CO3	The students will be able to summarize the recent research and technologies in the form of review and will be able to deliver power point presentations on an assigned topic.
CO4	The students will be able to communicate his/her ideas with his peers as audience, which will enhance both oral and written communicationskills.
CO5	The students will be able to create interest to pursue lifelong learning.

SEMINAR PRESENTATION ASSESSMENTN FORM

Name of Student:		Session:	2022-23
Enrollment Number:		Date:	
Name of Subject:	Seminar on Clinical Issues	Subject code:	PT505
Topics:			

Criteria	Sub-Criteria	Max. Marks	Marks Obtained
Introduction (Max marks-09)	Use appropriate background information	03	
	Has clear statement of purpose	03	
	Shows a logical sequence	03	
Factual Content (Max marks- 21)	Includes accurate information	03	
	Shows up-to-date content	03	
	Presents relevant content	03	
	Shows in-depth and sufficient details	03	
	Addresses all important issues	03	
	Is selective	03	
	Use of proper English Grammar in the text	03	
Presentation Quality (Max marks-06)	Has a good design of presentation (appropriate font, type, size, color, matter per slide etc.)	03	
	Has a clear verbal expression and eye contact with audience	03	
Response to questions (Max marks-09)	Answers question(s) correctly	03	
	Has the ability to think on the spot	03	
	Shows an ability to defend content of presentation	03	
Time Management (Max. mark-05)	Completes the presentation within allocated time	05	
Total Marks		50	

Note: In case of Oral Presentation, each student will be assessed in a 20 minutes time (15 min for presentation & 5 min for discussion) out of 50 marks.

Comments/Suggestions:

(Name and signature of Incharge)

(Head, Physiotherapy)

EVALUATION OF SEMINAR ON CLINICAL ISSUES PRESENTATION

MPT- Students has to prepare minimum 2 long case and 2 short cases during their seminar presentation during due course of time. The evaluation for internal seminar examination of 100 marks will be distributed:

Cases during clinical posting=**45 marks**.

Viva voce =**50 marks**

Attendance=**5 marks**

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO1	2	3	3	2	3	2	3	1	2	1	-	-	3	2	3	3
CO2	3	3	3	3	2	2	3	2	1	3	-	-	2	2	3	2	3
CO3	3	3	3	3	2	2	3	2	1	3	-	-	3	2	2	2	3
CO4	3	3	3	3	2	2	3	2	1	3	-	-	2	3	2	2	3
CO5	3	3	3	3	2	2	3	2	1	3	-	-	3	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.	
		Emplo yability	Entrep reneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
PT505	SEMINAR ON CLINICAL ISSUES	√	√	√				√	√	3,4,9, 17



Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	PT506	Title of the Course	CLINICAL POSTING	L	T	P	C
Year	I	Semester	I	0	0	14	7
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Students will engage in clinical practice in Physiotherapy departments in the musculoskeletal, neurology, cardiopulmonary, sports settings to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.						

Course Outcomes	
CO1	To learn the punctuality and interaction with colleague and supporting staff during clinical training.
CO2	To develop assessment skills.
CO3	To develop appropriate treatment protocol.
CO4	To understand the importance of documentation of the case record and case presentation.
CO5	To develop discipline and improve overall quality of clinical work.

CLINICAL POSTING ASSESSMENT FORM

Name of Student:		Session:	
Enrolment Number:		Date:	
Name of Subject:	Clinical Posting	Subject code:	PT506
Topics:			

S. No.	Point to be Considered	Max. Marks	Marks Obtained
1.	Punctuality	5	
2.	Interaction with colleagues and supporting staff	5	
3.	Maintenance of case records	5	
4.	Presentation of case during rounds	5	
5.	Investigation work up	5	
6.	Bedside Manners	5	
7.	Rapport with patients	5	
8.	Treatment approach & technique	5	
9.	Discipline	5	
10.	Overall quality of clinical work	5	
TOTAL SCORE		50	

(Name and signature of Incharge)

(Head, Physiotherapy)

GUIDELINES FOR CLINICAL TRAINING PROGRAM

The students of Post Graduate Physiotherapy program must spend above mentioned allotted time period in the hospital based clinical training for specified clinical experiences to meet the objectives of the training program. This period of practical and theoretical experience will enable the students to acquire competency and experience to perform as an independent practice and will enable to adjust to the real practical life in different units in the hospital settings.

S.No.	Program Name	Year/Semester	Duration of Training
1.	MPT	Ist Year/ Ist Semester	4 Months
2.		Ist Year/ IInd Semester	4 Months
3.		IInd Year/ 3rd Semester	4 Months
4.		IInd Year/ 4th Semester	4 Months

By the successful completion of this clinical training period, the student is expected to fulfil the objectives of the program and will be examination as given below:

S.No.	Program Name	Year/Semester	Case file	Practical on Case	Voice/Viva	Attendance
1.	MPT	Ist Year/ Ist Semester	20 Marks	25 Marks (1 Long Case and 2 Short Case)	50 Marks	5 Marks
2.		Ist Year/ IInd Semester				
3.		IInd Year/ 3rd Semester				
4.		IInd Year/ 4th Semester				

EVALUATION OF CLINICAL POSTING

MPT- Students has to prepare 1 long case and 2 short cases during their clinical posting. The evaluation for internal clinical examination of 100 marks will be distributed:

Cases during clinical posting=**45 marks**.

Viva voce =**50 marks**

Attendance=**5 marks**

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	POs												PSOs				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	2	3	1	2	1	-	-	3	2	3	3	2
CO2	3	3	3	3	2	2	3	2	1	3	-	-	2	2	3	2	3
CO3	3	3	3	3	2	2	3	2	1	3	-	-	3	2	2	2	3
CO4	3	3	3	3	2	2	3	2	1	3	-	-	2	3	2	2	3
CO5	3	3	3	3	2	2	3	2	1	3	-	-	3	2	3	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes						SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	
PT506	CLINICAL POSTING	√	√	√	√	√	√	3,4,11



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PHYSIOTHERAPY

**MASTER OF PHYSIOTHERAPY
(MPT)
NEUROLOGY**

SYLLABUS

YEAR/ SEMESTER: I/II



Integral University, Lucknow

Effective from Session: 2022-2023							
Course Code	PT507	Title of the Course	MEDICAL & SURGICAL CONDITION	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Students will be able to know and revise the basic concept musculoskeletal, neurological, cardiopulmonary, sports and their diagnostic concepts.						

Course Outcomes	
CO1	To know the basic concept of disorder and condition of musculoskeletal conditions.
CO2	To know the basic concept of disorder and condition of neurological conditions.
CO3	To know the basic concept of disorder and condition of cardiopulmonary conditions.
CO4	To know the basic concept of disorder and condition of sports conditions.
CO5	To know the basic concept of disorder or condition of on the basis of diagnostic tolls.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	MUSCULOSKELETAL TRAUMA & DISORDERS	1. Brief about Trauma of the Upper Limb, Trauma of the Lower Limb, Trauma of the Spine. 2. Brief about Disorders of the Upper Lim, Disorders of the Lower Limb, Disorders of the Spine. 3. Brief about Metabolic Disorders of the Bone. 4. Brief about bone tumors.	8	CO1
2	NEUROLOGICAL TRAUMA & DISORDERS	1. Brief about Traumatic injury of brain & spinal cords. 2. Brief about Traumatic injury of upper limb and lower limb nerve. 3. Brief about disease of brain, spinal cord and nerves. 4. Brief about disease neuromuscular disorders.	8	CO2
3	CARDIOVASCULAR TRAUMA & DISORDERS	1. Brief about Obstructive Pulmonary Diseases, restrictive Pulmonary Diseases. 2. Brief about cardiovascular disorders. 3. Brief about cardiovascular disease of new born and children. 4. Brief about cardiothoracic surgeries'.	8	CO3
4	SPORTS INJURIES	1. Brief about common sports injuries (contact & non contact) of upper limb & lower limb. 2. Brief about common sports injuries of head, spine chest and abdomen. 3. Brief about Female athletes & their special concerns. 4. Brief about disabled athletes and their special concerns.	8	CO4
5	LABORATORY, IMAGING AND ELECTRO DIAGNOSTIC STUDIES	1. Laboratory and imaging studies used in musculoskeletal disease and trauma. 2. Laboratory, imaging studies and electro diagnostic studies used in neurological disease and trauma. 3. Laboratory and imaging studies used in cardiopulmonary disease. 4. Laboratory and imaging studies used in sports injuries.	8	CO5

Reference Books:

1. Current Diagnosis & treatment in Orthopaedics by Harry Skinner
2. Essential of Musculoskeletal Care by Walter Green
3. Orthopaedics Imaging A Practical Approach by Adam Greenspan
4. Principles of Neurology; Adam & Victor
5. Brain's Clinical Neurology. R Bannister
6. . Saunder's Mannual for Neurologic Practice. Randolf Evans, Elsevier
7. Starkey, C., & Ryan, J. L. Evaluation of Orthopedic and Athletic Injuries; F. A. Davis.
8. Arnheim, D. D, & Prentice, W. E. Principles of Athletic Training, 10th Ed. Brown & Benchmark.
9. Principles and Practice of Medicine. Davidson

e-Learning Source:

4. <https://youtu.be/Bt0aaxpDITd8>
5. <https://youtu.be/Bt0aaxrpDITd8>
6. <https://youtu.be/hpwinnlr-ZHB0>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	-	-	-	1	1	-	1	-	-	-	3	3	1	1	-	3
CO2	3	3	-	-	-	1	1	-	1	-	-	-	3	3	1	1	-	3
CO3	3	3	3	1	2	2	1	1	1	-	-	-	2	3	1	1	-	3
CO4	-	-	2	-	2	2	2	-	-	-	-	-	1	2	2	-	-	-
CO5	2	3	3	1	3	3	1	-	-	-	-	1	3	3	2	-	-	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
PT507	MEDICAL & SURGICAL CONDITION	√		√			√	√	3,4



Integral University, Lucknow

Effective from Session: 2015-2016							
Course Code	PT508	Title of the Course	BIOMECHANICS AND KINESIOLOGY-I	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Students will be able to identify and apply principles of biomechanics while setting up individualized treatment protocols. Following are the topics to be included but not limited to:						

Course Outcomes	
CO1	Students must know about the concepts fundamental of mechanics and its implementation on human body.
CO2	Students must know about the concepts kinematics and kinetics and its implementation on human body.
CO3	Students must know about the concepts joint mechanics and its implementation on human body.
CO4	Students must know about the concepts Muscles, Ligament & Tendon Mechanics and its implementation on human body.
CO5	Students must know about the concepts measurement instruments and its implementation on human body.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	FUNDAMENTAL MECHANICS	1. Forces, Moments, Newton's Laws, Force Systems, Composition and Resolution of Forces, Static Equilibrium, Dynamic Equilibrium, Levers & its application, Pulley Systems, Density & Mass, Segmental Dimensions, Stress and Strain, Modulus of Rigidity and Modulus of Elasticity, Poisson's Effect, Strain Energy, Static and Cyclic Load Behaviours, Load, Load Sharing and Load Transfer. 2. Mechanical Energy, Work & Power: Definitions, Positive and Negative Work of Muscles, Muscle Mechanical Power, Causes of Inefficient Movement, Co- Contractions, Isometric Contraction against Gravity, Jerky Movement, Energy generation at one Joint and Absorption at another, Energy Flow, Energy Storage	8	CO1
2	KINEMATICS & KINETICS	1. Kinematics: Types of Motion, Location of Motion, Magnitude of Motion, Direction of Motion, Angular Motion and Its Various Parameters, Linear Motion and Its Various Parameters, Projectile Motions. 2. Kinetics: Definition of Forces, Force Vectors, Naming of Force, Force of Gravity & COG, Stability, Reaction Forces, Equilibrium, Linear Forces System, Friction and Its Various Parameters, Parallel Force Systems, Concurrent Force Systems, Work Powers & Energy, Moment Arms of Force, Force Components, Equilibrium of Force	8	CO2
3	JOINT MECHANICS	1. Joint Mechanics: Joints and its classification, Joint Design, Joint Categories, Joint Functions, Arthrokinematics, Osteokinematics, Kinematic Chain, Joint Forces, Equilibrium & Distribution of These Forces, Degenerative Changes in Weight Bearing Joints & Compensatory Actions, Joint Stability & Its Mechanisms, Clinical Applications.	8	CO3
4	MUSCLES, LIGAMENT & TENDON MECHANICS	1. Structure & Composition of Muscle, Fiber Length & Cross Section Area, Mechanical Properties, EMG Changes during Fatigue & Contraction, Changes in Mechanical Properties because of Ageing and Exercised & Immobilization, Clinical Applications of mechanics. Structure and Composition, Mechanical Properties, Cross Sectional Area Measurements, Muscle Tendon Properties, Temperature Sensitivity, Changes in Mechanical Properties because of Aging, Exercise and Immobilization, Mechanoreceptors, & Clinical Applications.	8	CO4
5	MEASUREMENT INSTRUMENTS	1. Goniometer, Accelerometer, Photo Optical Devices, Pressure Transducers & Force Plates, Gait Analyzer, Isokinetic Device, EMG, Electrophysiology of Muscle Contraction, Recording Processing, Relationship between EMG and Biomechanical Variables.	8	CO5

Reference Books:

1. Biomechanics & Clinical Kinesiology-Cynthia Norkin
2. Basic Biomechanics. Nordin.
3. Basic Biomechanics & clinical Kinesiology. Otis
4. Biomechanics of Human Movement. D Winter
5. Kinesiology: Application to Pathological Motion. GL Soderberg
6. Brunnstrom's Clinical Kinesiology. LK Smith, EL Weiss, LD Lehmkuhl

e-Learning Source:

1. <https://www.youtube.com/watch?v=yoY9bYQOX8Q>
2. <https://www.youtube.com/watch?v=WoJyS7Nww38>
3. <https://www.youtube.com/watch?v=5LAmgw2tVDo>
4. <https://www.youtube.com/watch?v=JS06rSzWsyYM>
5. <https://www.youtube.com/watch?v=rxX6Z1rv7TE>

PO-PSO	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1	1	2	2	-	-	-	-	3	1	1	2	1
CO2	3	3	2	2	2	2	2	2	-	-	-	-	3	1	1	2	1
CO3	2	3	3	1	2	2	1	1	-	-	-	-	3	3	2	2	1
CO4	3	3	3	1	2	2	1	1	-	-	-	-	3	3	2	2	1
CO5	3	2	3	3	2	2	2	3	-	-	-	-	3	3	2	1	1

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs Common for all branches / Disciplines

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
PT508	BIOMECHANICS AND KINESIOLOGY-I	√	√	√				√	√	3,4,9



Integral University, Lucknow

Effective from Session: 2015-16										
Course Code	PT510	Title of the Course	BIOMECHANICS AND KINESIOLOGY-I LAB				L	T	P	C
Year	I	Semester	II				0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil							
Course Objectives	Students will be able to identify and apply principles of biomechanics while setting up individualized treatment protocols. Following are the topics to be included but not limited to. This involves application of topics in demonstrations, field visits and case presentations									

Course Outcomes	
CO1	Students must know about the concepts fundamental of mechanics and its implementation on human body.
CO2	Students must know about the concepts kinematics and kinetics and its implementation on human body.
CO3	Students must know about the concepts joint mechanics and its implementation on human body.
CO4	Students must know about the concepts Muscles, Ligament & Tendon Mechanics and its implementation on human body.
CO5	Students must know about the concepts measurement instruments and its implementation on human body.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	FUNDAMENTAL MECHANICS	Practical Demonstration of fundamental mechanics & their application in human body.	6	CO1
2	KINEMATICS & KINETICS	Practical Demonstration of kinematics & kinetics & their application in human body.	4	CO2
3	JOINT MECHANICS	Practical Demonstration of joint mechanics & their application in human body.	4	CO3
4	MUSCLES, LIGAMENT & TENDON MECHANICS	Practical Demonstration of muscles, ligament & tendon mechanics & their application in human body.	6	CO4
5	MEASUREMENT INSTRUMENTS	Practical Demonstration of measurement instruments used in biomechanical aspects & their application in human body.	4	CO5

Reference Books:	
Reference Books:	
7. Biomechanics & Clinical Kinesiology-Cynthia Norkin	
8. Basic Biomechanics. Nordin.	
9. Basic Biomechanics & clinical Kinesiology. Otis	
10. Biomechanics of Human Movement. D Winter	
11. Kinesiology: Application to Pathological Motion. GL Soderberg	
e-Learning Source:	
6. https://www.youtube.com/watch?v=yoY9bYQOX8Q	
7. https://www.youtube.com/watch?v=WoJyS7Nww38	
8. https://www.youtube.com/watch?v=rxX6Z1rv7TE	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
	CO																
CO1	1	2	1	1	1	1	2	1	-	-	-	-	3	1	1	1	1
CO2	3	3	2	1	2	2	1	2	-	-	-	-	2	1	1	2	1
CO3	2	3	3	1	2	2	1	1	-	-	-	-	3	3	2	2	1
CO4	2	3	2	1	2	2	2	1	-	-	-	-	2	3	2	2	1
CO5	2	2	3	3	2	3	2	3	-	-	-	-	2	3	2	1	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.	
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
PT510	BIOMECHANICS AND KINESIOLOGY-I LAB	√	√	√				√	√	3,4,9

