SANKALCHAND PATEL UNIVERSITY
।। अथातो ज्ञानजिज्ञासा ।।

FACULTY OF PHYSIOTHERAPY
Second Year Bachelor of Physiotherapy
In Effect from Academic Year 2023-24

Branch Name:	**BACHELOR OF PHYSIOTHERAPY**
Program Code:	**PT101**
Course Title:	**EXERCISE THERAPY - II**
Course Code:	**2PT1010203**
Pre-requisite Course:	**Human Anatomy, Exercise Therapy I & Soft Tissue Manipulation**

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)			Credit	Evaluation Scheme (Marks)					
				Theory(T)		Practical(P)		Total Marks	
Lecture	Tutorial	Practical		University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Theory	Practical
4	-	4	12	80	20	80	20	100	100

COURSE OUTCOMES:

At the end of the course the candidate will be able to

1. Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.
2. Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively.
3. To demonstrate general fitness, exercise and shall gain fitness for one self.

Subject Contents:

Sr. No.	Topic	Hours
1	**Passive movements:** a) Definition b) Types c) Technique d) Effects and uses e) CPM unit f) Comparison of active with passive movements for all joints of exterminates, neck and trunk.	10
2	**Stretching** a) Definitions related to stretching b) Types of contractures c) Differentiation properties of soft tissues affecting elongation and aims of stretching d) Manual and mechanical stretching, e) Cycle mechanical stretching f) Indications g) Aims of stretching h) Principles i) Contraindications j) Myofascial Release Technique (MFR)	25
3	**Traction** a) Types b) Effects c) Principles of application for cervical and lumbar spine d) Traction to soft tissues of joints – gliding movements	10

4	**Manual Therapy and Peripheral Joint Mobilization** a) Causes of restriction of R.O.M., b) Prevention of restrictions, c) Schools of Manual Therapy d) Basics of Maitland, Kaltenborn, Mulligan mobilization e) Biomechanical basis for joint mobilization f) Principles of application of Joint Mobilization g) Joint shapes and types of motion; h) Stretching, glides, compression, traction i) Grades of mobilization j) Techniques of mobilization of various joints of limbs k) Mobilization of joints R.O.M. through functional diagonal patterns, l) Joint manipulation-definition, types m) Indications, contraindications, precautions of joint mobilization and manipulation	35
5	**Advance soft tissue Mobilization** a) Basic principles of MET (Muscle Energy Techniques), b) MFR (Myofascial Release Techniques) c) PRT (Positional Release Therapy) d) Neural Tissue Mobilization e) Active release techniques (Basics only)	17
6	**Manual Muscle Testing (M.M.T.)** a) Need of M.M.T b) Uses of MMT c) Fundamental principles, d) Anatomical and physiological basis, e) Oxford scale of muscle gradation, f) Principles of isolation, substitution, stabilization, g) Grading procedure for muscles of extremities, neck and trunk. h) Limitations of manual muscle testing i) Techniques of MMT for individual muscles and group j) Static power Test k) Dynamic power Test l) Endurance test m) Dynamometers - Technique of application and uses n) Voluntary control of movement gradation by Bobath, Brunnstrom.	35
7	**Posture:** a) Types b) Factors influencing posture c) Regulation of posture and posture mechanism d) Pelvic tilt and postural deviations of spine and its treatment e) Principles of re-education: corrective methods and techniques f) Patient education g) Crawling exercises:Principles,types,effects and uses of clapp'crawl	10
8	**Strengthening of muscles (PRE):** a) Physiology of muscle performance - Structure of skeletal muscle, chemical and mechanical events during contraction and relaxation, muscle fiber type, motor unit, forces gradation. Causes of decreased muscle performance Physiologic adaptation to training: Strength & Power, Endurance b) Principles involved to prevent muscle wasting, c) Rood's technique of initiating muscle contraction, d) Progressive strengthening of muscles (loads assisted and resisted exercises), e) Use of equipment f) Re-education of muscles and restoration of functions g) Practice of strengthening of muscles of limbs, neck, trunk and face	30

	h) Use of manual and mechanical resistance i) Contraindications j) Isometric and isokinetic exercises regime k) Plyometrics l) Specific exercise regimens m) Isotonic: de Lormes, Oxford, macqueen, Circuit weight training n) Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics Isokinetic regimens	
9	**Proprioceptive Neuromuscular Facilitation** a) Introduction b) Responses of nm mechanism c) Definitions & goals d) Basic neurophysiologic principles of PNF e) Basic techniques of PNF patterns of arm, leg, neck, head and trunk (emphasis on straight patterns) f) Specific techniques of facilitation g) Mobility: contract relax, hold relax, rhythmic initiation h) Strengthening: slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization i) Stability: alternating isometric, rhythmic stabilization j) Skill: timing for emphasis, resisted progression endurance: slow reversals, agonist reversal k) Inhibitory techniques l) Bobath rood's and kabat approaches	35
10	**Relaxation** a) Definitions: Muscle Tone, Postural tone, Voluntary Movement b) Degrees of relaxation c) Pathological tension in muscle d) Stress mechanics e) Types of stresses Effects of stress on the body mechanism f) Indications of relaxation g) Methods & techniques of relaxation h) Principles & uses i) Techniques of relaxation - General, Local, Jacobson's, Mitchel's, additional methods	10
11	**Balance** a) Physiology of balance: b) Contributions of sensory systems c) Processing sensory information d) Generating motor output e) Components of balance (sensory, musculoskeletal, biomechanical) f) Causes of impaired balance g) Examination & evaluation of impaired balance h) Activities for treating impaired balance: mode, posture, movement i) Precautions & contraindications j) Types k) Balance retraining	15
12	**Neuro Muscular coordination:** a) Anatomy & Physiology of cerebellum with its pathways b) Definitions: Co-ordination, Inco-ordination c) Causes for Inco-ordination d) Test for co-ordination: equilibrium test, non equilibrium test e) Factors governing co ordination f) Principles of re-education	15

	g) Frenkel's Exercise: uses and technique of application and progression h) Home exercise	
13	**Functional Re education:** a) Mat activities for re education of hemiplegics, paraplegics, quadruplegics and cerebral palsy b) Walking and functional re-education in neurological and orthopedic conditions.	15
14	**Aerobic exercises:** a) Definition and key terms b) Physiological response to aerobic exercise c) Examination and evaluation of aerobic capacity d) Exercise Testing, fitness testing, stress testing for healthy and convalescent individuals. e) Determinants of an Exercise Program f) Normal and abnormal response to acute aerobic exercise g) Physiological changes that occur with training h) Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training i) Physiological effects and therapeutic uses, Pharmacological aspects of exercises.	15
15	**Breathing exercises:** a) Mechanisms of normal breathing b) Muscles of respiration c) Changes in thoracic cage during the process of respiration d) Segmental and diaphragmatic breathing exercises, pursed lip breathing e) FET f) Breathing mechanisms and postural drainage g) Assistive measures h) Techniques, indications and contraindications	20
16	**Hydrotherapy:** a) Physiological properties of water and hydrodynamics b) Use of special equipments, techniques, Effects and uses, merits and demerits of hydrotherapy c) Applications of Bad Ragaz Technique d) Indications and contraindications	07

List of References:

Text Books:

1. The Principles of Exercise Therapy", M Deena Gardiner – 4th Edition
2. Carolyn Kishner,John Borstad,Lynn Allen Colby , Therapeutic exercise foundations and techniques - 8th Edition
3. Textbook of Therapeutic Exercises, Narayanan,S.Lakshmi- **1st** Edition**.**

Reference Books:

1. Daniels and Worthingham's Muscle testing:Techniques of manual examination and Performance Testing, Avers,Dale Brown – 1st Edition.
2. Exercise Therapy Workbook f or Physiotherapy Students by PATEL B D- 1st Edition
3. Sullivan, Physical Rehabilitation - 7th Edition

List of Open Source Software/learning website:

- k-hub.in e library|A single platform for all e resources (K-hub, E-Resource)
  - User Name- KB4605VNG
  - Password- BL@69BX!

- knowledgegainer.delnet.in (Delnet , E-Resource)
  - User Name- gjspum

- Password- spu10924

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.	1 Remembering 2 Understanding 4 Analysis
CLO2	Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively.	1 Remembering 2 Understanding 3 Applying 5 Evaluate 6 Creating
CLO3	To demonstrate Passive movement, Stretching, Manual Therapy, general fitness guidelines exercise.	2 Understanding 3 Applying
CLO4	Acquire the skill to perform and evaluate PRE, PNF, Neuromuscular coordination, Balance and Functional Re-education.	2 Understanding 3 Applying 4 Analysis
CLO5	Evaluate and identify Normal and abnormal postures.	2 Understanding 3 Applying 4 Analysis 5 Evaluate
CLO6	Able to know the recent advances and able to Discuss evidence based practice.	2 Understanding 3 Applying 5 Evaluate 6 Creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)								Program Specific Outcomes (PSOs)							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
CLO1	M	H	H						H							
CLO2	H	M	M			M				H				M		M
CLO3				M							H	H				
CLO4					L								M		L	
CLO5							M	L						M	M	
CLO6					H				L							M

H: High, M: Medium, L: Low