INSTITUTE	**FACULTY OF PHYSIOTHERAPY**
PROGRAM	**BACHELOR OF PHYSIOTHERAPY**
SEMESTER	**1**
COURSE TITLE	**FUNDAMENTALS OF EXERCISE MODALITIES**
COURSE CODE	**BPT-104**
COURSE CREDITS	**8**

Objective:

1 Apply the principles of physics in describing human movement including force, inertia, and laws of motion.
2 Explain planes and axes of movement and methods of measuring joint movements.
3 Demonstrate the ability to measure joint movements using standard and electronic tools (including electronic goniometer).
4 Demonstrate fundamental and derived positions and identify associated muscle actions.
5 Perform basic physiotherapy assessment techniques including motor, sensory, coordination, and balance evaluation.
6 Demonstrate safe and effective transfer techniques and prescribe appropriate basic movement aids.

Course Outcomes: After completion of this course, student will be able to:

1 Apply the principles of physics in describing human movement including force, inertia, and laws of motion.
2 Explain planes and axes of movement and methods of measuring joint movements.
3 Demonstrate the ability to measure joint movements using standard and electronic tools (including electronic goniometer).
4 Demonstrate fundamental and derived positions and identify associated muscle actions.
5 Perform basic physiotherapy assessment techniques including motor, sensory, coordination, and balance evaluation.
6 Demonstrate safe and effective transfer techniques and prescribe appropriate basic movement aids.

Pre-requisite of course:A basic understanding of physics and human biology—bones and muscles is essential for exercise therapy.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
120	0	60	50	30	20	50	50

DR. ASHISH DHIRAJLAL KAKKAD (PT)
Digitally signed by (Name of HOD)

DR. ASHISH DHIRAJLAL KAKKAD (PT)
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
1	**Basic principles** Describe the aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, and Assessment of patient's condition – Measurements of Vital parameters , Apply the principles of mechanics applied to Exercise Therapy: Force, Composition, Resolution, Equilibrium- stable, unstable, neutral gravity-LOG-COG, levers-types, Speed, velocity, work, energy, power, acceleration, momentum, friction and inertia , Discuss Muscle work group action of muscles, angle of pull and mechanical efficiency of the muscles.	24
2	**Starting and Derived Positions** Demonstrate the starting positions, their muscle work, effects and uses and Standing, Kneeling, Sitting, Lying and Hanging., Demonstrate derived positions. Discuss the muscle work of each derived position Unit 3: Measurement of Joint Range , Demonstrate Different methods of measuring range of motion (ROM)., Discuss Reliability and validity of goniometry. Functional ROM and normal range of motion of various joint. Technique of Goniometry., Perform ROM measurement of individual joint's using goniometer.	24
3	**Muscle testing** Discuss the Principles & Aims, Indications & Limitations, and Techniques of MMT for group & individual testing, Demonstrate Manual Muscle testing procedure, Perform MMT for upper limb, lower limb spine and face muscles	24
4	**Classification of therapeutic exercise** Classify therapeutic exercises: Technique, effects, therapeutic use, Demonstrate Active Movements , Discuss active movements in terms of Definition of strength, power & work, endurance, muscle actions, Causes of decreased muscle performance, , Explain the Physiological adaptation to training: Strength & Power, Endurance., Demonstrate Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses , Demonstrate Active Assisted Exercise:, Discuss the principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses , Demonstrate Resisted Exercise: Discuss the principles, indications, contraindications, precautions &techniques, effects and uses Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise , Demonstrate Passive Movements: Discuss Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements demonstrate Mobilization exercises of the joints region-wise- passive, active	24

DR. ASHISH DHIRAJLAL KAKKAD (PT)
Digitally signed by (Name of HOD)

DR. ASHISH DHIRAJLAL KAKKAD (PT)
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
5	**Manipulation** Classify various types of soft tissue manipulation techniques., Discuss Physiological effects, therapeutic effects and contraindications of soft tissue manipulation. , Describe effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc., Perform effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.	24
Total Hours		**120**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Practical** Demonstrate the different types of muscle contraction, muscle work, group action of muscles and co-coordinated movements on self , Demonstrate various fundamental and derived positions. And describe muscle work, and uses on self, Measure the ROM of joints using hand held goniometer – upper limb, lower limb & trunk on human model , Demonstrate the relaxed passive movement of joints of upper limb and lower limb on human model , Instruct the patient to perform of the active mobilisation exercises of joints of upper limb and lower limb on human model , Perform passive mobilisation exercises of different joints region wise on self / human model , Demonstrate the testing of muscle strength/ function region wise – upper limb, lower limb and trunk On human model , Perform all the soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face On human model, Demonstration ONLY [to be shown to the student by the teacher] Digital goniometry,Pelvic inclinometry Dynamometry Accessory passive movement	60
Total Hours		**60**

Textbook :

1 Principles of Exercise Therapy, M. Dena Gardiner, CBS Publishers & Distributors, Delhi, 2023

2 Practical Exercise Therapy, Margaret Hollis, Blackwell Scientific Publications, 1999

3 Therapeutic Exercise: Foundations and Techniques, Carolyn Kisner, Lynn Allen Colby, John Borstad, F.A. Davis Company, 2023

4 Principles and Practice of Therapeutic Massage, Akhoury Gourang Sinha, Jaypee Brothers Medical Publishers, 2024

5 Massage for Therapists: A Guide to Soft Tissue Therapy, Margaret Hollis, Wiley, 2009

6 Muscles: Testing and Function with Posture and Pain, Florence Peterson Kendall et al., Lippincott Williams & Wilkins, 2005

7 Daniels and Worthingham’s Muscle Testing: Techniques of Manual Examination, Helen J. Hislop, Jacqueline Montgomery, W.B. Saunders / Elsevier, 2007

Textbook :

8 Measurement of Joint Motion: A Guide to Goniometry , Cynthia C. Norkin, D. Joyce White , F.A. Davis Company, 2017

References:

1 Therapeutic Exercise, Therapeutic Exercise, John V. Basmajian , Williams & Wilkins, 1984

2 Massage, Manipulation, and Traction , Massage, Manipulation, and Traction , Sidney H. Licht (Editor) , E. Licht (original), reprinted by R.E. Krieger Pub. Co., 1976

3 Global Strategy on Diet, Physical Activity and Health , Global Strategy on Diet, Physical Activity and Health , World Health Organization WHO, World Health Organization WHO, 2008

4 Exercise Physiology: Nutrition, Energy, and Human Performance , Exercise Physiology: Nutrition, Energy, and Human Performance , William D. McArdle, Frank I. Katch, Victor L. Katch , Lippincott Williams & Wilkins, 2010

5 Methods of Group Exercise Instruction , Methods of Group Exercise Instruction , Carol Kennedy-Armbruster, Mary M. Yoke , Human Kinetics, 2020

6 ACSM's Guidelines for Exercise Testing and Prescription, ACSM's Guidelines for Exercise Testing and Prescription, American College of Sports Medicine , Wolters Kluwer, 2021

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
0.00	0.00	35.00	35.00	30.00	0.00

Instructional Method:

1 Lecture

2 Flipped class

3 Video demonstration

4 Demonstration

5 Lab works

DR. ASHISH DHIRAJLAL KAKKAD (PT)

Digitally signed by (Name of HOD)

DR. ASHISH DHIRAJLAL KAKKAD (PT)

Digitally signed by (Name of Dean/ Principal)