

<b>COURSE</b>	<b>FACULTY OF PHYSIOTHERAPY</b>
<b>PROGRAM</b>	<b>BACHELOR OF PHYSIOTHERAPY</b>
<b>SEMESTER</b>	<b>2</b>
<b>COURSE TITLE</b>	<b>KINESIOLOGY</b>
<b>COURSE CODE</b>	<b>17PT0204</b>
<b>COURSE CREDITS</b>	<b>6</b>

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

- 1 Analyze normal human movement from a global perspective, integrating biomechanics, force, muscle mechanics and motor control theory.
- 2 Experience quantitative methods of movement analysis using various methods.
- 3 Apply the analytic methods to specific examples of normal human motor performance.
- 4 Use these methods for evaluation and treatment of disorders of the Musculoskeletal system.
- 5 Apply the analytic methods of different muscles and its effects on specific joints in the human body.
- 6 Acquire the knowledge about locomotion and its kinetic -kinematic analysis.

**Pre-requisite of course:** At the end of the course the candidate will be able to 1. Acquire the skill of assessment of isolated and group muscle strength subjectively and objectively. 2. Analyze normal human posture and its associated problems, its management. 3. Analyze the various normal musculoskeletal movements during breathing, gait and daily living activities and in terms of biomechanical and physiological principles.

#### Teaching and Examination Scheme

<b>Theory Hours</b>	<b>Tutorial Hours</b>	<b>Practical Hours</b>	<b>ESE</b>	<b>IA</b>	<b>CSE</b>	<b>Viva</b>	<b>Term Work</b>
120	0	0	25	15	10	0	0

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>General bio-mechanics</b> General bio-mechanics: Kinematics and Introduction to Kinetics, Description of motion (Kinematics) Types of motion, laws of motion, location of motion, direction of motion, magnitude of motion, Analysis of force (Kinetic) Definition of force, magnitude of force, point of application, direction of force, Components of force, composite effects of two or more forces, torque, Force of	15

	friction, force of inertia, force of gravity, equilibrium, Work 1. Lever: definition, orders of lever, anatomical lever, levers in Physiotherapy 2. Anatomical pulley, anatomical wheel & axis, Principles of stability Base of support, height, mass of body, the impact of forces (e.g. Gravity), segmentation, visual factors, psychological factors, physiological factors, Mechanism of joint motion a) Types of joints, structure of joints, joint function and motion, Materials Used in Human Joints b) General Properties of Connective Tissue c) General Changes with Disease, Injury, Immobilization, Exercise, and Overuse on joints, Mechanics of muscle action Classification of muscle, functional characteristics of muscle, line of pull, length-tension relationship, types of muscle contractions, group action of muscles, angle of pull, action of two joint muscle, Effects of Immobilization, Injury, and Aging on muscle	
2	<b>Skilled Movements</b> Rope climbing, cycling, running, ballistic and volitional movements	5
3	<b>Impetus</b> Impetus to external objects and receiving impetus	2
4	<b>Locomotion</b> Normal gait analysis: definition of gait, phases of normal gait, normal gait with kinetic and kinematics, abnormal pathological gaits, gait training	5
5	<b>Biomechanics of joints</b> Kinetics, kinematics and patho-mechanics of joint – hip , Kinetics, kinematics and patho-mechanics of joint – knee, Kinetics, kinematics and patho-mechanics of joint – ankle and foot complex, Kinetics, kinematics and patho-mechanics of joint – shoulder, Kinetics, kinematics and patho-mechanics of joint – elbow, Kinetics, kinematics and patho-mechanics of joint – wrist and hand complex, Kinetics, kinematics and patho-mechanics of – TM joint	70
6	<b>Biomechanics of spinal column</b> Spinal curves, articulations of spinal column joints, non contractile soft tissue of column, IV disc, ligaments, movements of spinal column and muscle mechanics, intrinsic equilibrium of spine	5
7	<b>Biomechanics of pelvic complex</b> Pelvis at rest, in standing body and in motion, patho mechanics of pelvis	5
8	<b>Biomechanics of thorax</b> Movements between ribs and vertebrae, sternum and ribs, patho mechanics of respiration	3
9	<b>Postural strain and occupational hazards</b> use of body mechanics at home, at school and work, recreation, particular application of body mechanics for patients, physiotherapists and other staff.	5

10	<b>Kinetics and kinematics of ADL</b> Supine to sitting, Sitting to standing, Squatting, Climbing up and down, pushing, pulling, overhead activities, walking, running, jogging.	5
<b>Total Hours</b>		

**References:**

Textbooks:

1. Joint structure and function - Cynthia Norkin

Reference books:

1. Therapeutic exercise - Kisner and Colby

2. Principles of exercise therapy - Dina Gardiner

3. Clinical kinesiology – Brunnstrom

4. Muscles: Testing & Function with posture & pain. Florence Peterson Kendall

5. Kinesiology: The Mechanics & Pathomechanics of human movement – Carol A. Otis

6. Kinesiology - Wells, Katharine F.

7. The Physiology of Joints: I. A. Kapanji

