RKUNIVERSITY

SYLLABUS

Biokinesiology I

Course Title	BIOKINESIOLOGY I
Course Code	PT208
Course Credit	Lecture: 3
	Practical: 2
	Clinical Training: 0
	Total: 5

Course Objectives

On completion of unit students should be able to

1. Understand the fundamentals of Biokinesiology, concept of structural stability and functional mobility related to various diseases and disorders.
2. Apply knowledge of kinesiology in professional physiotherapy practice.
3. Demonstrate and practice concepts of biomechanics and pathomechanics of axial & appendicle joints.
4. Analyse Normal human posture, gait, other physical & function activities like sitting to standing etc.

#	Detailed Syllabus	Hours	
	Section I	**T**	**P**
1.	**INTRODUCTION OF MECHANICS AND HUMAN MECHANICS RELATING TO PHYSICAL THERAPY**		
	Basic Concepts in Biokinesiology :		
	Kinematics and Kinetics. Types of Motion, Location of Motion, Direction of Motion Magnitude of Motion.	1	0
	Definition of Forces, Force of Gravity, Reaction forces, Moment arm of force, Force components, Force of friction, Concurrent force system, Parallel force systems	1	0
	Joint Axis & Plane	1	0
	Equilibrium, Objects in Motion, Work, Equilibrium of levers	2	0
2.	**Joint structure and Function**		
	Joint design	1	0
	Materials used in human joints	1	0
	General properties of connective tissues	1	0
	Human joint design	1	0
	Joint function and Joint motion	1	0
	General effects of disease, injury and immobilization	1	0
3.	**Muscle structure and function**		
	Mobility and stability functions of muscles	2	0
	Elements of muscle structure	2	0
	Muscle function	1	0

	Effects of immobilization, injury and aging	1	0
4.	**Goniometry**		
	Principles of goniometry	1	2
	Types of goniometers	1	0
	Normal range of various Upper limb joints	1	0
	Measurement of individual joint range using goniometers 1. **Shoulder Joint** 2. **Elbow joint** 3. **Radioulnar joint** 4. **Wrist joint** 5. **MCP, PIP, DIP joint**	3	 4 2 2 2 4
5.	**The Shoulder complex :**		
	Components of shoulder complex	1	0
	Scapulo thoracic and gleno humeral contributions	1	2
	Sterno clavicular and acromioclavicular contributions	1	0
	Structural dysfunction of shoulder muscles and shoulder pathomechanics.	1	0
	Section II		
6.	**The elbow complex**		
	Structure of elbow joint, Axis of motion, Muscle of motion	2	0
	Mobility and stability of elbow complex	2	0
	Applied pathomechanics	1	0
7.	**The wrist and hand complex** :		
	Radio carpal joint structure, Midcarpal joint structure	2	0
	Function of wrist complex	1	0
	Flexor mechanism, Extensor mechanism	2	0
	Structure of thumb	1	0
	Prehension, Power grip, Precision handling	1	2
	Functional position of the wrist and hand and applied pathomechanics	2	0
8.	**Biokinesiology of the Thorax and Chest wall:**		
	Structure and Function of rib cage, Coordination and Integration of Ventilatory Motions	2	0
	Pathomechanics of rib cage	1	0
	Biomechanics of Respiration	2	2
9.	Advance Bio kinesiology in physiotherapy practice.	1	2
	Applied Bio kinesiology in sports and physical performance.	2	0
	Biokinesiology in functional outcome measures	2	0
10.	**Goniometry**		
	Normal range of various Upper limb joints	1	0
	Measurement of individual joint range using goniometers	2	0

	1. **Hip joint** 2. **Knee joint** 3. **Ankle joint** 4. **Foot Complex**		5 2 2 3

Instruction Method

1. Teaching and training sessions will be carried out through active learning. Active participation and contribution in group discussion and seminars are mandatory for students
2. Lectures to be conducted with the help of black board and/or audio-visual aids that includes multi-media projector, OHP, etc.
3. Problem based and/or case based assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
4. The course includes a laboratory where the students have an opportunity to build and appreciation for the concepts being taught in lectures.
1. Instruction method will be integrated with clinical training, bedside / class room teaching and tutorials as necessary.

Text Books

1. Joint Structure and Function: A Comprehensive Analysis: 5th edition. Levangie PC; Norkin CC. F. A. Davis Company

Reference Books

1. **Basic Biomechanics of the Musculoskeletal System: 4th edition.** Nordins M; Frankel VH. LWW
2. **Kinesiology: The Mechanics and Pathomechanics of Human Movement**: Carol A. Oatis
3. **Brunnstrom's Clinical Kinesiology: 6th edition.** Houglum PA; Bertoti DB. JP Bros Medical Publishers, Bangalore