



Dr. D.Y. PATIL COLLEGE OF PHYSIOTHERAPY

Dr. D.Y.PATIL VIDYAPEETH, PUNE

(DEEMED TO BE UNIVERSITY)

Re-accredited by NAAC with a CGPA of 3.62 on a four point scale at 'A' Grade.

(An ISO 9001:2008 Certified University)

LESSON PLAN

Subject : BIOMECHANICS
Class : BPT II year III Semester (2017)
Class Incharge : Dr. Amita Aggarwal (PT)
Subject Teacher/s : Dr. Divya Gohil, Dr. Neha Kulkarni (PT)
Total Hours prescribed: -144 (Didactic-64, Practical/laboratory-32, SPT- 48)

Sr No.	Topic	No. of hours required		Mode of teaching
		Th	Pr	
1	<u>Section- 1: Mechanics</u> <ul style="list-style-type: none"> • Introduction to mechanics including motion, forces, parallel forces system, kinetics, kinematics • Newton’s law of motion, concurrent force system- composition forces, muscle action line etc. • Centre of gravity, line of gravity, stability and equilibrium. • Introduction to bio-mechanics and terminology • Axes and planes with movements occurring at each joint in respective plan 	2 1 1	1 1	Lecture, Group discussion, Demonstrations
2	<u>Section-2- Muscle Structure and Function</u> <ul style="list-style-type: none"> • Muscle structure: composition, unit, structure, architecture of muscle • Classification of muscles • Functions of muscles and factors affecting its function. • Effect of immobilization, injury and aging on muscle • Group action of muscle 	3 1 1 1	2 1 1	PowerPoint presentation, Question and Answer Sessions, Demonstrations.
3	<ul style="list-style-type: none"> • Basic principles of joint design and a human joint 	1		PowerPoint presentation, Question and Answer

<ul style="list-style-type: none"> • Joint function 	2	1	Sessions, Demonstrations
<ul style="list-style-type: none"> • Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue. 	1		PowerPoint presentation, Question and Answer
<ul style="list-style-type: none"> • Classification of joints 	1	1	Sessions, Demonstrations.
<ul style="list-style-type: none"> • Recall anatomy and study the biomechanics in detail of following joints: 			PowerPoint presentation, Question and Answer
<ul style="list-style-type: none"> ➤ <u>Upper limb:</u> 	18	5	Sessions, Demonstrations
1. Biomechanics of shoulder			
<ul style="list-style-type: none"> • Introduction 	1		PowerPoint presentation,
<ul style="list-style-type: none"> • Kinematics 	3	1	Question and Answer
<ul style="list-style-type: none"> • kinetics 	3	1	Sessions, Demonstrations
2. Biomechanics of elbow:			
<ul style="list-style-type: none"> • Introduction and kinematics 	1	1	PowerPoint presentation,
<ul style="list-style-type: none"> • kinetics 	1		Question and Answer
3. Biomechanics of wrist:			Sessions, Demonstrations
<ul style="list-style-type: none"> • Introduction and kinematics 	1	1	PowerPoint presentation,
<ul style="list-style-type: none"> • kinetics 	1		Question and Answer
4. Biomechanics of hand:			Sessions, Demonstrations
<ul style="list-style-type: none"> • Introduction 	1	1	PowerPoint presentation,
<ul style="list-style-type: none"> • Kinematics 	3		Question and Answer
<ul style="list-style-type: none"> • kinetics 	3		Sessions, Demonstrations
<ul style="list-style-type: none"> ➤ <u>Lower limb:</u> 	18	5	
1. Biomechanics of hip			
<ul style="list-style-type: none"> • Introduction 	1		PowerPoint presentation,
<ul style="list-style-type: none"> • Kinematics 	3	1	Question and Answer
<ul style="list-style-type: none"> • kinetics 	2	1	Sessions, Demonstrations
2. Biomechanics of knee			
<ul style="list-style-type: none"> • Introduction 	1		
<ul style="list-style-type: none"> • Kinematics 	3	1	PowerPoint presentation,
<ul style="list-style-type: none"> • kinetics 	3	1	Question and Answer
3. Biomechanics of ankle			
<ul style="list-style-type: none"> • Introduction and kinematics 	1	1	PowerPoint presentation,
<ul style="list-style-type: none"> • kinetics 	1		Question and Answer
4. Biomechanics of foot			
<ul style="list-style-type: none"> • Introduction 	1	-	PowerPoint presentation,
<ul style="list-style-type: none"> • Kinematics 	1		Question and Answer
<ul style="list-style-type: none"> • kinetics 	1		Sessions, Demonstrations

	<ul style="list-style-type: none"> ➤ <u>Vertebral Column:</u> <ol style="list-style-type: none"> 1. Introduction 2. Biomechanics of Cervical spine: <ul style="list-style-type: none"> • Introduction • Kinematics and kinetics 3. Biomechanics of thoracic spine 4. Biomechanics of thoracic cage <ul style="list-style-type: none"> • Introduction • Kinematics and kinetics 5. Biomechanics of lumbar spine: <ul style="list-style-type: none"> • Introduction • Kinematics and kinetics 6. Biomechanics of sacroiliac joint.: <ul style="list-style-type: none"> • Introduction • Kinematics and kinetics ➤ Biomechanics of temporomandibular joint <ul style="list-style-type: none"> • Introduction • Kinematics and kinetics • Kinetics and kinematics of various activities of daily living: <ul style="list-style-type: none"> ➤ supine to sitting, sitting to standing, squatting, climbing up & down ➤ lifting, pulling, pushing, overhead activities ➤ walking, running and jogging. 	<p>11</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>5</p> <p>1</p> <p></p> <p>1</p> <p>1</p> <p></p> <p>1</p> <p>1</p> <p></p> <p>1</p> <p>1</p> <p></p> <p>4</p> <p>3</p> <p>2</p>	<p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p> <p>PowerPoint presentation, Question and Answer Sessions, Demonstrations</p>
4	<ul style="list-style-type: none"> • Biomechanical alterations of all joint due to muscle weakness, joint stiffness and its implications 	2	1	Lecture+ Assignment

Total Didactic Hours –

Theory: 64hours

Practical: 32 hours

SPT: 48 hours

Total scheduled hours – 144 hours

