Philadelphia University	PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	**Approval date:**
Faculty: Allied Medical Sciences		**Version: 1**
Department: Physical Therapy		**Credit hours: 2**
Academic year 2022/2023	**Course Syllabus**	**Bachelor**

Course information

Course#	Course title	Pre-requisite	
1120226	**Biomechanics**	**General Physics for Health Sciences (0216135)**	
Course type		**Class time**	**Room #**
☐ University Requirement ☐ Faculty Requirement ☐ Major Requirement ☐ Elective ☒ Compulsory		**Mon: 8.15am - 9.15am** **Wed: 8.15am - 9.15am**	**421**

Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Dr. J. Madhanagopal	**15409**	**0785302488**	**Sun: 11.15am-1.15pm** **Mon: 2pm-4pm** **Wed: 11.15am-1.15pm**	**mjagannathan@philadelphia.edu.jo**

Course Delivery Method

Course Delivery Method			
☒ **Physical**	☐ **Online**	☐ **Blended**	
Learning Model			
Precentage	**Synchronous**	**Asynchronous**	**Physical**
			100%

Course Description

This course is designed to impart the knowledge to students about biomechanical principles and its analysis in the context of physical therapy. This course covers the structure, kinematics and kinetics of all joints of the human body including posture and gait which enhances their critical thinking skills.

Course Learning Outcomes

	Number	Outcomes	Corresponding Program outcomes
	Knowledge		
1	**K2**	Explain the kinetics and kinematics of joints of the human body using the biomechanical principles	**KP2**
2	**K4**	Classify the normal gait and its deviation, optimum posture and abnormal posture using the biomechanical principles	**KP2**
	Skills		
1	**S3**	Demonstrate the biomechanical analysis of joints on human simulator	**SP3**
2	**S3**	Display the posture and abnormal postures assessment using REEDCO posture scale and observational skills and pathological gait evaluation by observation	**SP2**
	Competencies		

Learning Resources

Course textbook	**Joint Structure and function: A comprehensive Analysis, Pamela K. Levangie, Cynthia C. Norkin and Micheal D. Lewek ,6th edition; 2019; ISBN-13: 978-0-8036-5878-3**
Supporting References	Basic Biomechanics, Susan J. Hall, 8th edition; 2018: ISBN-9781260085549
Supporting websites	www.ebesco.com
Teaching Environment	☒**Classroom** ☒ **laboratory** ☐**Learning platform** ☐**Other**

Meetings and subjects timetable

Week	Topic	Learning Methods	Learning Material
1	**Course syllabus, Vision, Mission, Aim and LO of the Program** **Introduction to Biomechanics and its principles** Kinematics Descriptions of motion Newton's laws	Lecture	**Vision, Mission, Aim and LO of the Program** **Text book Chapter 1** **Supporting Ref: Chapter 1& 2**
2	**Kinetics** Force systems	Lecture	**Text book Chapter 1** **Supporting Ref:**

	Lever systems Force components		**Chapter: 3**
3	**Shoulder complex** Components, Structure Kinematics	Lecture	**Text book Chapter 7** **Supporting Ref: Chapter: 7**
4	**Shoulder complex** Kinetics	Lecture & Problem solving based learning	**Text book Chapter 7** **Supporting Ref: Chapter: 7**
5	**Elbow complex** Components, Structure Kinematics Kinetics	Lecture & Problem solving based learning	**Text book Chapter 8** **Supporting Ref: Chapter: 7**
6	**The Wrist and Hand complex** Components, Structure Kinematics Kinetics	Lecture	**Text book Chapter 9** **Supporting Ref: Chapter: 7**
7	**Hip Joint** Components, Structure Kinematics	Lecture	**Text book Chapter 10** **Supporting Ref: Chapter: 8**
8	**Hip Joint** Kinetics	Lecture& Case based learning	**Text book Chapter 10** **Supporting Ref: Chapter: 8**
9	**Knee Joint** Components, Structure Kinematics Kinetics	Lecture	**Text book Chapter 11** **Supporting Ref: Chapter: 8**
10	**Patellofemoral Joint** Components, Structure Kinematics Kinetics	Lecture & Problem solving based learning	**Text book Chapter 11** **Supporting Ref: Chapter: 8**
11	**Ankle and foot complex** Components, Structure Kinematics Kinetics	Lecture	**Text book Chapter 12** **Supporting Ref: Chapter: 8**

12	Posture Static and dynamic Kinematics and kinetics Analysis of sitting, lying and standing posture	Lecture & Problem solving based learning	**Text book Chapter 13**
13	Gait Kinetics and kinematics Stair climbing Abnormal gait	Lecture & Problem solving based learning	**Text book Chapter 14**
14	**Cervical and Thoracic** Components, Structure Kinematics Kinetics	Lecture	**Text book Chapter 4 Supporting Ref: Chapter: 9**
15	**Lumbopelvic** Components, Structure Kinematics Kinetics	Lecture	**Text book Chapter 4 Supporting Ref: Chapter: 9**
16	**Final Exam**		

* includes: Lecture, flipped Class, project- based learning, problem solving based learning, collaborative learning

☐ Online session

Course Contributing to Learner Skill Development

Using Technology
Learnt evidence based assessment tools in this course will develop their critical thinking and problem solving skills
Communication skills
Develops interpersonal skills while interacting with the simulator
Application of concepts learnt
Learnt concepts in this course will facilitate critical thinking, clinical reasoning and decision making skills while assessing the patients/simulator

Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Midterm exam	**30%**	**7**	**K2**
Term Work* 1) Quiz* 2) Assignment* 1 and 2	**30%**	**14 & 15**	**K4 & S3**
Final Exam	**40%**	**16**	**K2**
Total	**100%**		

* includes: quiz, in class and out of class assignment, presentations, reports, videotaped assignment, group or individual projects.

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Learning Method*	Assessment Method**
Knowledge			
K2	Explain the kinetics and kinematics of joints of the human body using the biomechanical principles	Lecture	**Exam**
K4	Classify the normal gait and its deviation, optimum posture and abnormal posture using the biomechanical principles	Lecture & Problem solving based learning	**Exam & Quiz**
Skills			
S3	Demonstrate the biomechanical analysis of joints on human simulator	Lecture & Problem solving based learning	**Assignment 1**
S3	Display the posture and abnormal postures assessment using REEDCO posture scale and observation and pathological gait evaluation by observation	Lecture & Problem solving based learning	**Assignment 2**
Competencies			

* includes: Lecture, flipped Class, project- based learning, problem solving based learning, collaborative learning

** includes: quiz, in class and out of class assignment, presentations, reports, videotaped assignment, group or individual projects.

Course Polices

Policy	Policy Requirements
Passing Grade	The minimum pass for the course is (50%) and the minimum final mark is (20%).
Missing Exams	• Anyone absent from a declared semester exam without a sick or compulsive excuse accepted by the dean of the college that proposes the course, a zero mark shall be placed on that exam and calculated in his final mark. • Anyone absent from a declared semester exam with a sick or compulsive excuse accepted by the dean of the college that proposes the course must submit proof of his excuse within a week from the date of the excuse's disappearance, and in this case, the subject teacher must hold a compensation exam for the student. • Anyone absent from a final exam with a sick excuse or a compulsive

	excuse accepted by the dean of the college that proposes the material must submit proof of his excuse within three days from the date of holding that exam.
Attendance	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to 3 lecture days and 4 lectures days. If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory or compulsive excuse accepted by the dean of the faculty, he is prohibited from taking the final exam and his result in that subject is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college that is considered. The article is introduced, it is considered withdrawn from that article, and the provisions of withdrawal shall apply to it.
Academic Honesty	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as cheating, plagiarism (academic theft), collusion, intellectual property rights

Program Learning Outcomes to be assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Target Performance level
KP2	The program will graduate students able to acquire knowledge in basic medical sciences, various medical conditions and surgical treatments, and determine their impact on the individual and society.	**Biomechanics**	**Theory Exam & Quiz**	75% of students have a minimum score 6 out of 10
SP3	The program will graduate students able to effectively use the scientific resources related to physiotherapy and use of appropriate tools of planning and analyzing disease cases in order to reach the appropriate treatment plan	**Biomechanics**	**Assignment**	75% of students have a minimum score 6 out of 10
SP2	The program will graduate students able to perform a safe, systematic and appropriate assessment and intervention for different physiotherapy circumstances.	**Biomechanics**	**Assignment**	75% of students have a minimum score 6 out of 10

Description of Program Learning Outcome Assessment Method

Number	Detailed Description of Assessment
KP2	This intended program learning outcome (IPLO) will be assessed by theory exam (MCQ and Essay questions), Assignment and Quiz
SP2	This IPLO will be assessed by using out of class assignment. The following rubrics will be used to evaluate the student's skills.
SP3	This IPLO will be assessed by using out of class assignment. The following rubrics will be used to evaluate the student's skills.

Assignment Rubrics

	Criteria	Weak (0-3)	Average (4-6)	Satisfactory (7-9)	Competent (10-12)	Score
1	**Identify the main issue/ problem**	Unable to identify issue/problem in complex situations. Uncertain and unable to assess adequately.	Able to identify an issue/problem in a complex situation but less able to assess adequately.	Able to identify a problem with clarity but moderately able to assess and justify the situation.	Able to identify issue/ problem in a complex situation and able to assess and justify the situation.	___ x 2
2	**Analysis of the issue/problem**	Unable to analyze issue/problem in complex situations and uncertain and unable to assess adequately.	Able to analyze issue/ problem in a complex situation but less able to assess adequately.	Able to analyze issue/problem with clarity but moderately able to assess and justify the situation.	Able to analyze issue/problem in a complex situation and able to assess and justify the situation.	___ x 2
3	**Generate ideas and alternative solutions/strategies**	Unable to provide ideas and alternative solutions.	Moderately able to think but lack the capability to offer some solutions.	Able to analyze a discussion at certain level but with very limited capability to develop ideas.	Able to develop and improve thinking skills. Able to analyze and clearly explain a situation and assess the discussion.	___ x 2
4	**Information management**	Poorly updated the information and lack of correlation	Minimum updated information and needs improvement	Adequate updated information lack of correlation	High correlation of information with current trends and advances	___ x 2
5	**Plagiarism**	More than 80%	Between 40-80%	Between 20-40%	Less than 20 %	___ x 1
6	**Relevance and List**	No relevance	Sufficient	Good	Excellent	___ x

	of references	and fails to use the references in a correct way	relevance, partially fulfill the required number of references	relevance, fulfill and appropriate use of references	relevance and exceed the required number of references	1