Philadelphia University

Faculty of Engineering & Technology

Department of Mechanical Engineering

First Semester 2023/2024

Course Information

Course Title:	**Statics (62021)**
Prerequisite:	Calculus-1 (0250101)
Credit Hours:	3 credit hours (16 weeks per semester, approximately 44 contact hours)
Textbook:	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler
References:	Statics-7th edition by J. Meriam and L. Kraig
Website:	http://www.philadelphia.edu.jo/academics/nmusa
Course Description:	Force vectors, equilibrium of a particle, moment of a force, equilibrium of a rigid body. internal normal, shear forces, and bending moment. moment of inertia, and the centroid location.
Instructors:	**Dr. Nabil Musa** **Email**: nmusa@philadelphia.edu.jo **Office**: Engineering Building, room E61206, ext.:2343 **Office hours**: Sat, Sun, Mon Tues, 12:00-13:00 Mon
Course Coordinator:	**Dr. Nabil Musa** **Email**: nmusa@philadelphia.edu.jo **Office**: Engineering Building, room E61206, ext.:2343 **Office hours**: Sat, Sun, Mon Tues, 12:00-13:00 Mon
Technology Requirements:	• Personal computer, laptop, or mobile phone. • Internet Connection. • Access to Philadelphia University E-Learning Portal (MS Teams and Moodle)
Learning Style:	Blended
Communication:	• Announcement: the announcements will be posted in MS Teams or Moodle on a regular basis. • Email. • MS Teams or Moodle chats.
Course Objectives	• Introduction and Basic Concepts of Statics, Force vectors, 2-D, and 3-D scalar and vector formulation and its operations. • Equilibrium of a particle, Moment of a force, couple of moments. • Internal Forces, Shear force, and Bending Moment, and its

	diagram. • Centroid, the center of gravity, and moment of inertia.

Course Learning Outcomes (CLO) and Relation to ABET Student Outcomes		
CLOs	**Outcomes**	**ABET PLOs**
K1, K2	Draw the free-body diagram for a particle and a rigid-body	1
K2	Understand the basic concepts of force vectors and the moment of a force	1
K2	Apply the above-mentioned three basic concepts and understand their respective advantages.	1
K2	Explain the geometry of the equilibrium of particles and rigid bodies.	1
K2	Effectively communicate in writing an assignment.	1

Grading Policy and Assessment Instruments					
Graded Item	**Marks**	**Topic (s)**	**CLO(s)**	**Learning Portal** (Teams/ Moodle/ F2F/ Others)	**Week**
Assignment 1	5	2-D, and 3_D equilibrium of a particle	K1, K2	F2F	5
Assignment 2	5		K1, K2	F2F	11
Quiz 1	5	2- D moment of a force	K1, K2	F2F	4
Quiz 2	5	Principle of moments	K1, K2	F2F	6
Quiz 3	5	Resultant force and couple system	K1, K2	F2F	10
Quiz 4	5	3- D moment and couple	K1, K2	F2F	12
Mid Exam	30%	Weeks 1-8	K1, K2	F2F	8
Final Exam	40%	Week 1-15	K1, K2	F2F	16
Total Marks	**100%**				
Notes:	• Two written exams will be given. • Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero marks for that homework. • Quizzes: 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s). • Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date. • The final exam will cover all the class material.				

Course Content: Learning Resources/ References/ Activities/ Assessment Methods

Week	Lecture	Topic	CLOs	Learning Resources/ References/ Activities/ Assessment Method	Learning Style (F2F, Synchronous, Asynchronous)	Learning & Teaching Methods	Assessment Method
1	**L1**	Introduction and Basic Concepts of Statics	-	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. K	F2F	White board notes	-
	L2	Scalar and vectors	K1	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board notes	F2F questions
	L3	Vector operations	K1	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle	F2F questions
2	**L1**	Vector addition of forces	K1	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board note+ PPP	F2F questions
	L2	Addition of a system of coplanar forces	K2, S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board notes +PPP	F2F questions
	L3	Cartesian vectors	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	-
3	**L1**	Position vectors	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board notes + PPP	F2F questions
	L2	2-D equilibrium of a particle	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L.	F2F	White board notes	F2F questions

				Kraig		+ PPP	
	L3	3-D equilibrium of a particle	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	-
4	**L1**	Moment of a force Quiz 1	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board notes + PPP	F2F questions Quiz
	L2	Moment scalar formulation	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	White board notes + PPP	F2F questions
	L3	Moment vector formulation	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	F2F Quiz next lecture
5	**L1**	Principle of moments	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L2	Principle of moments scalar formulation	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L3	Principle of moments scalar formulation (lecture) Assignment 1	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	Discussion Assignment
6	**L1**	Principle of moments vector formulation (lecture)	K2, S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F question
	L2	Principle of moments vector formulation (lecture) Quiz 2	K2, S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + quiz

	L3	Moment of couple scalar formulation (problem-solving)	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	PPP + white board	Discussion in the class
7	**L1**	Moment of couple scalar formulation (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L2	Moment of couple vector formulation (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L3	Moment of couple vector formulation (problem-solving)	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	-
8	**L1**	Equivalent system of forces		Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	-	Written exam
	L2	Equivalent system of forces	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L3	Equivalent system of forces (problem-solving)	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	Report writing
9	**L1**	Equivalent system of forces (problem-solving)	K2, S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	-----
	L2	Equivalent system of forces (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L3	Resultant force and	S2	Philadelphia University E-learning System (Moodle).	Asynchrono	Moodle +	--

		couple system (lecture)			us	MS teams	
10	**L1**	Resultant force and couple system (lecture) Quiz 3	K2 , S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + quiz
	L2	Resultant force and couple system (problem-solving)	K2 , S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F question
	L3	Resultant force and couple system (problem-solving)	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	Class discussion
11	**L1**	Resultant force and couple system (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L2	Reduction of a force and couple system (lecture)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L3	Reduction of a force and couple system (lecture) Assignment 2	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	Discussion Assignment
12	**L1**	Reduction of a force and couple system (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L2	Reduction of a force and couple system (problem-solving) Quiz 4	K2 , S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + quiz
	L3	Reduction of a simple distributed loading (lecture)		Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	--------

13	**L1**	Reduction of a simple distributed loading (problem-solving)	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L2	Equilibrium of rigid bod	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions
	L3	Free body diagram and support reaction	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	--
14	L1	Center of gravity and centroid	K2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig Kraig	F2F	PPP + white board	F2F questions + students presentation
	L2	Composite bodies	K2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L3	Axis of symmetry and reference axis	S2	Philadelphia University E-learning System (Moodle).	Asynchronous	Moodle + MS teams	Report writing
15	**L1**	Moment of inertia	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation
	L2	Moment of inertia for composite areas	S2	Engineering Mechanics-Statics-12th edition by R. C. Hibbeler, and Statics-7th edition by J. Meriam and L. Kraig	F2F	PPP + white board	F2F questions + students presentation

16		Parallel-axis Theorem for an area	K2, S2		F2F	PPP + white board	

Notes:
For Blended and F2F Courses: L1 & L2 each 1 hour.
For Online Course: L1 and L2 each 1.5 hours.

Credit Hours Distribution Report	
Learning Style	**Credit Hours**
F2F	32
Synchronous	0
Asynchronous	16
Total	48

Academic Honesty/ Student Conduct	○ As a student at Philadelphia University, you are expected to follow the university regulations and guidelines for academic honesty/student conduct found in the student handbook. ○ This means that you should not cheat, plagiarize, and let another student use your account in LMS learning portals.
Attendance Policy	Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

October 2023