هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification

(Bachelor)

Course Title:	Statics
Course Code:	CE 1101
Program:	Bachelor of Science in Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering and Architecture
Institution:	Umm Al Qura University
Version:	1
Last Revision Date:	31 January 2025

Table of Contents

A. General information about the course: 3

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods 4

C. Course Content 6

D. Students Assessment Activities 7

E. Learning Resources and Facilities 7

F. Assessment of Course Quality 8

G. Specification Approval 9

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 3/ 2nd Year)					
4. Course General Description:					
The course presents the basics and principles of mechanics-statics and how to analyze the force and moment vectors in 2D and 3D. In addition how to analyze structures and check their equilibrium and determine the centroid and inertia of composite bodies and friction analysis between different objects.					
5. Pre-requirements for this course (if any)**:**					
PHYS1110-Physics (1) for Engineering and MTH1182-Calculus (2) for Engineering					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The course aims to teach fundamental concepts of mechanics with the application of the laws of statics for solving engineering problems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Enable the students to demonstrate the principles and laws of statics and be able to apply them using vector analysis, derivatives, and integrals for solving problems.	K1	Lectures, class work and in-class discussions	Homework assignments and Classwork tests
1.2	Enable the students to outline the free body diagrams, determine reactions, analysis of forces in 2 & 3 dimensions, and state the resultant and moments of different force systems.	K1	Lectures, class work and in-class discussions	Homework assignments and Classwork tests
2.0	**Skills**			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.1	To select and apply appropriate mathematical methods for reactions calculations, section properties, and analysis.	S2	Lectures, projects, and discussions.	Homework assignments and evaluation of individual and group tasks and Classwork tests
2.2	To determine and analyze simple trusses, friction problems, and calculate centroids and moment of inertia for simple and composite sections.	S2	Lectures, projects, and discussions.	Homework assignments and evaluation of individual and group tasks and Classwork tests
2.3	Communicate with others and identify the objectives and thinking and analysis of solving a particular problem and how to demonstrate the different alternative solutions.	S4	Lectures, projects, and discussions.	Homework assignments and evaluation of individual and group tasks and Classwork tests
3.0	**Values, autonomy, and responsibility**			
3.1	To ethically integrate in professional disciplinary teams and use skills required to find out different solutions and different alternatives in the structural-related projects serving society.	V1	English communications, ethics practice, and respecting deadlines.	Written exams and homework assignments

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2	To demonstrate the ability of life-long learning by applying communication and logic using mathematical language in a suitable way.	V3	Small group work and activities related to projects serving society.	Written exams and homework assignments

C. Course Content

No	List of Topics	Contact Hours
1.	Mechanics, basic concepts, scalars and vectors, Newton's low, units.	3
2.	Force, 2-D force systems – rectangular components, moment and couple, resultants	3
3.	3-D force systems – rectangular components, moment and couple, resultants	3
4.	Moments and force equivalent	3
5.	Virginian's theorem - parallel forces	3
6.	Equilibrium in 2-D – system isolation and free-body diagram.	3
7.	Equilibrium conditions - reactions calculations for statically determinate structures	3
8.	Plane simple trusses	3
9.	Method of joints	3
10.	Method of section	3
11.	Frames and machines	3
12.	Mass centroid and centroid of line, Centroids of areas, volumes and composite bodies, beams- external effects	3
13.	Centroids of areas, volumes and composite bodies, beams- external effects	3
14.	Friction: friction phenomena, types of friction and dry friction	3
15.	Section properties (Area moments of inertia, rectangular and polar moment of inertia, radius of gyration, composite areas).	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Homework Assignments**	2-10	15%
2.	**Mid-term Exam**	8	35%
3.	**Final Exam**	16	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• J.L Meriam, L.G. Kraige, "Engineering Mechanics", Volume One, 7th Edition, John, Wiley & Sons, Inc. 2011
Supportive References	• J.L Meriam, L.G. Kraige, "Engineering Mechanics", Volume One, 5th Edition, John, Wiley & Sons, Inc. 2002 • Hibbeler, R. C., "Engineering Mechanics; Statics" 14th Edition, Prentice Hall, 2016 • Bedford, A; and Flower, W., "Engineering Mechanics; Statics", 3ed edition, Prentice Hall, 2001 • Beer, F.P., and Johnson, E.J., “Vector Mechanics for Engineers: STATICS”.
Electronic Materials	• PowerPoint files
Other Learning Materials	• Theoretical Mechanics, E. Neal Moore, John Wiley Publisher, 456 pages, 1983. • Principles of Mechanics, John l Synge, Byron Griffith, McGraw-Hill Book Company, 552 pages, 1959.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	The whiteboard needs to be replaced with a bigger one.
Technology equipment (projector, smart board, software)	A Smart Board is needed
Other equipment (depending on the nature of the specialty)	Printers and laptops for staff members with required computer software programs are required.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Faculty members who teach this course	• Students questioners running at the semester end. • Analysis of students` marks • Regular feedback of the students about the course and the teaching methods
Effectiveness of Students assessment	Faculty members who teach this course and those teaching other courses relevant to this course.	• Regular revising and improving of the course contents and consulting the faculty members who teach this course and those teaching other courses relevant to this course.
Quality of learning resources	Faculty members who teach this course	• Frequent improvement for teaching and learning techniques. • Frequent survey for latest references. • Encouraging the students in team work cooperation and writing reports.
The extent to which CLOs have been achieved	Independent member(s) teaching staff	• A sample of students' answer sheets is revised by a specified committee of the department.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CIVIL ENGINEERING COUNCIL
REFERENCE NO.	THE FIFTEENTH SESSION OF THE ACADEMIC YEAR 1446
DATE	30 APRIL 2025

