Course Specification

(Bachelor)

Course Title:	Statics
Course Code:	ME 2213
Program:	Bachelor in Mechanical Engineering
Department:	Mechanical Engineering
College:	Engineering
Institution:	King Khalid University
Version:	1
Last Revision Date:	05/03/2024

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (3/2)					
4. Course general Description:					
Statics is a fundamental branch of engineering mechanics that deals with the equilibrium of particles and rigid bodies. It includes basic principles and mathematical operations related to force and position vectors, understanding rotational tendencies of forces and simplification of force systems, and equilibrium of bodies subject to friction. Geometric properties of various shapes and rigid bodies and their moment of inertia also is covered in this course. Statics serves as a foundation for other engineering courses, including Dynamics, Mechanics of Solids, and Fluid Mechanics. It equips engineers with problem-solving skills and mathematical modeling techniques.					
5. Pre-requirements for this course (if any)**:**					
NA					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
Upon completion of this course, students will be able to: • Understand the vector and scalar representation of forces and moments • Static equilibrium of particles and rigid bodies both in two dimensions and in three dimensions. • To understand and calculate Center of gravity and moment of inertia of a rigid body • Plot the bending moment diagram of a rigid body					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid • Traditional classroom		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	15
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		**30**

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define basic concepts of static, calculation of the moment, resultant force, and moment.	**KLO1**	• Lectures • E learning • Tutorials • Self-learning	• Short quizzes • Exams • Assignments
1.2	Describe the center of gravity of a rigid body.	**KLO1**	• Lectures • E learning • Tutorials	• Short quizzes • Exams • Assignments
...				
2.0	**Skills**			
2.1	Solve and interpret problems of static of real rigid body.	**KLO3**	• Lectures • E learning • Tutorials	• Assignments • Mid and Final exams • Tutorials
2.2	Construct the shear-bending diagram and plot the curve.	**KLO3**	• Lectures • E learning • Tutorials	• Assignments • Mid and Final exams • Tutorials

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	**Values, autonomy, and responsibility**			
3.1	**NA**			
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	General Introduction to Engineering Mechanics, coordinates in 2D and 3D of a point, calculation of the vector and scalar product	3
2.	Equivalent forces, internal and external forces, calculation of the moment about point and axes, moment transfer from different points, reduction of the forces and the moments	5
3.	Equilibrium of rigid body, calculation of the unknown forces by equilibrium law (2D and 3D), various supports	4
4.	Equilibrium of bodies subject to friction	4
5.	Calculation of the centroid of rigid body, composite area method, theorems of Pappus-Guldinus, calculation of the concentrated force from distributed load	4
6.	Moment of inertia of various geometries	4
7.	Analysis of structures, trusses, frame and machines, calculation of the force using equilibrium law, draw the shear force and bending moment for the concentrated load, draw the shear force and bending moment for the distributed force	6
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exams (Mandatory)	5,10	30% (30 Marks)
2.	Assignments	4,8	10% (10 Marks)
3.	Quiz	5,9	10% (10 Marks)
4.	Tutorial/Homework	12	10% (10Marks)
5.	Final Exam	15	40% (40 Marks)
...			

*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	• Meriam, J. and L.G. Kraige, " Engineering Mechanics: SI Version. Statics", John Wiley and Sons Inc, 2013. (ISBN: 1118164997, 9781118164990) • R. C. Hibbeler, Engineering Mechanics: Statics, SI Units, Pearson Education, 2022 (9781292443935, 1292443936)
Supportive References	• Anthony Bedford, Wallace Fowler, Engineering Mechanics: Statics & Dynamics 5th Edition, Pearson; 5th edition (July 18, 2007) ISBN: (0136142257, 978-0136142256) • Stefan Lindström, “Lectures on Engineering Mechanics: Statics and Dynamics”, Lindström Stefan 2019 ISBN: 978-91-981287-4-1 (2019)
Electronic Materials	**NA**
Other Learning Materials	Lecture Handouts and Tutorials

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats
Technology equipment (projector, smart board, software)	Projector and smart board
Other equipment (depending on the nature of the specialty)	Laptop / Computer system Multimedia teaching Calculators

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (through course evaluation survey)
Effectiveness of Students assessment	Faculty and Quality Committee	Direct (through Rubrics)
Quality of learning resources	Students and faculty	Indirect (through university experience and mission-vision-PEO surveys)

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Quality Committee	Learning Outcome Assessment Review
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	