



Course Specification

— (Bachelor)

Course Title: **Statics**

Course Code: **101-GEC-3**

Program: **Bachelor of Science in Engineering**

Department: **Mechanical Engineering**

College: **College of Engineering**

Institution: **Najran University**

Version: **1.0**

Last Revision Date: **02/27/2024**



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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: Second Year \ Level 3

4. Course general Description:

Statics is the branch of engineering mechanics that is concentrated with the analysis of forces on bodies in statics equilibrium. The course covers seven major areas of study: (1) analysis of force systems and vectors (2) free-body diagrams and equilibrium of particles and rigid bodies, (3) structural analysis of internal and external forces of trusses and frames, (4) principles and application of friction; (5) centroids and centers of gravity, and (6) area moments of inertia (7) Friction

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

1. Analyze 2D and 3D force system and calculate moment.
2. Analyze beam and frame structures using equilibrium equation.
3. Analyze truss structure using various methods.
4. Locate centroid of composite cross section and evaluate moment of inertia about different axes.
5. Analyze and solve friction related equilibrium problems.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid		





No	Mode of Instruction	Contact Hours	Percentage
	<ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	15
2.	Laboratory/Studio	NIL
3.	Field	NIL
4.	Tutorial	45
5.	Others (specify)	NIL
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Analyze the 2D and 3D forces in terms of vector and scalar form.	1	<p>Knowledge and understanding</p> <p>TS-1: In-class, lecture using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p>	<p>Quizzes</p> <p>-Midterm exams</p> <p>-Assignments</p> <p>-Final exam</p>





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	
1.2	Locate the position of centroid for rectangular and composite structure	7	<p>TS-1: In-class, lecturing using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p> <p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	<p>-Quizzes</p> <p>-Midterm exams</p> <p>-Assignments</p> <p>-Final exam</p>
...				
2.0	Skills			
2.1	Analyze problem related to different forces on the body.	2	<p>Skills</p> <p>TS-1: In-class, lecture using power point where the</p>	<p>•Locally Developed Exams such as Mid & Final</p>



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p> <p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	<p>Exams with scoring rubrics</p> <ul style="list-style-type: none"> •Assignments involving critical and logical thinking questions
2.2	Solve problem related to truss and frame.	6	<p>TS-1: In-class, lecture using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p> <p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	<p>Quizzes</p> <p>-Midterm exam</p> <p>Assignments</p> <p>-Final exams</p>



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Ability to work independently and as part of team.	3	<p>Values, autonomy, and responsibility</p> <p>TS-1: In-class, lecture using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p> <p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	<p>-Quizzes</p> <p>-Midterm exams</p> <p>-Assignments</p> <p>-Final exam</p>
3.2	Ability to formulate mathematical solution	4	<p>TS-1: In-class, lecture using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p>	<p>Quizzes</p> <p>-Midterm exams</p> <p>-Assignments</p> <p>-Final exam</p>



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	
3.3	Ability to ask questions	3	<p>TS-1: In-class, lecture using power point where the previous knowledge is linked to the current and future topics</p> <p>TS-2: Tutorial discussions in the Class</p> <p>TS-3: Reading (books, internet search)</p> <p>TS: 4 – Associating the topics in each chapter with the CLO.</p> <p>TS:5 –Discussion with the students in the class hours</p>	<p>Quizzes</p> <p>-Midterm exams</p> <p>-Assignments</p> <p>-Final exam</p>

C. Course Content

No	List of Topics	Contact Hours
1.	Force systems; vector analysis, moments and couples in 2d and 3D	6
2.	Equilibrium of force systems	6
3.	Analysis of structures; plane trusses and frames	10





4.	Distributed force system	8
5.	Centroid of simple and composite bodies	8
6.	Area moments of inertia	10
7.	Analysis of beams	6
8.	Friction	6
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	1-10	10%
2.	Quizzes	Every 3 weeks	10%
3.	Mid-term	4 & 8	30%
4.	Labs	NA	NA
5.	Final exam	15	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	Engineering Mechanics- Statics (Sixth edition (SI Unit)), by JL Meriam & LG Kraige, John Wiley & Sons
Supportive References	RC Hibbler (2010). Engineering Mechanics, Statics, Twelfth Edition.
Electronic Materials	NA
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms with minimum 20 seat capacity
Technology equipment (projector, smart board, software)	Smart Projector, MS Excel, Word and Power point
Other equipment (depending on the nature of the specialty)	NA



F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT OF MECHANICAL ENGINEERING
REFERENCE NO.	
DATE	02/27/2024

