ENGI-241: ENGINEERING MECHANICS: STATICS

Effective Term
Fall 2026

CC Approval
12/05/2025

AS Approval
12/11/2025

BOT Approval
12/18/2025

COCI Approval
01/25/2026

SECTION A - Course Data Elements

CB04 Credit Status
Credit - Degree Applicable

Discipline

Minimum Qualifications	And/Or
Engineering (Master's Degree)	

Subject Code
ENGI - Engineering
Course Number
241

Department
Engineering

Division
Science and Engineering (SE)

Full Course Title
Engineering Mechanics: Statics

Short Title
Engineering Mechanics: Statics

CB03 TOP Code
0901.00 - Engineering, General (requires Calculus) (Transfer)

CIP Code
14.0101

CB08 Basic Skills Status
NBS - Not Basic Skills

CB09 SAM Code
E - Non-Occupational

Rationale
Update due to CCN changes.

SECTION B - Course Description

Catalog Course Description
This course is a study of rigid bodies in static equilibrium when acted upon by forces and couples in two-dimensional and three-dimensional space. Topics include analysis of equilibrium of rigid bodies, trusses, frames, and machines, as well as the calculation of centers of mass, centroids, friction, distributed forces, beams, shear and moment diagrams, and moments of inertia.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit
No

Repeatability
Not Repeatable

Grading Options
Letter Grade Only

Allow Audit
Yes

Requisites

Prerequisite(s)
Completion of MATH-C2220 and PHYS-140 with a minimum grade of C.

Requisite Justification

Requisite Description
Course Not in a Sequence

Subject
PHYS
Course #
140

Level of Scrutiny
Required by 4-Year Institution

Explanation
Calculus-Based Physics for Scientists and Engineers: A (C-ID PHYS 205) listed as a required prerequisite on the C-ID descriptor for Statics (C-ID ENGI 130)

Requisite Description
Course Not in a Sequence

Subject
MATH
Course #
C2220

Level of Scrutiny
Required by 4-Year Institution

Explanation
Single Variable Calculus II – Early Transcendentals (C-ID MATH 220) listed as a required prerequisite on the C-ID descriptor for Statics (C-ID ENGI 130)

SECTION D - Course Standards

Is this course variable unit?
No

Units
3

Lecture Hours
36

Lab Hours
54

Outside of Class Hours
72

Total Contact Hours
90

Total Student Hours
162

Distance Education Approval

Is this course offered through Distance Education?
Yes

Online Delivery Methods

DE Modalities	Permanent or Emergency Only?
Entirely Online	Permanent
Hybrid	Permanent
Online with Proctored Exams	Permanent

SECTION E - Course Content

Student Learning Outcomes

	Upon satisfactory completion of the course, students will be able to:
1.	Demonstrate knowledge and understanding of the equilibrium of rigid bodies, centroids, centers of gravity, and forces on submerged surfaces.
2.	Solve two- and three-dimensional engineering problems using vector mechanics, discuss results both qualitatively and quantitatively, and explain design applications and limitations.
3.	Demonstrate knowledge and understanding in analyzing trusses, frames, and beams, including shear and moment diagrams and friction.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1.	Solve two-and-three-dimensional engineering problems involving equilibrium conditions using vector mechanics.
2.	Analyze design problems requiring absolute values of loads on compound bodies, machines, trusses and other structures.
3.	Resolve centroids and centers of gravity.
4.	Solve problems in hydrostatics and related fields.
5.	Resolve shearing and bending movements in beams and related structures.
6.	Explain physical principles involved in bending, torquing.
7.	Set up and solve problems involving friction.

Course Content

1. Statics of Particles
   a. Forces in a Plane
   b. Forces in Space
2. Rigid Bodies: Equivalent Systems of Forces
3. Equilibrium of Rigid Bodies
   a. Equilibrium in Two Dimensions
   b. Equilibrium in Three Dimensions
4. Distributed Forces: Centroids and Centers of Gravity
   a. Areas and Lines
   b. Volumes
5. Analysis of Structures
   a. Trusses
   b. Frames and Machines
6. Forces in Beams
7. Friction

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Lab	Lab Experiments: 2-D and 3-D Force Systems, Structural Analysis, Shear Force and Bending Moment Diagrams, Friction
Lecture	Presentation of course material
Observation and Demonstration	Demonstrations using simulations
Discussion	Problem Solving Techniques, Statics vs Dynamics

Online Adaptation

Types	Examples of learning activities
Lab	Lab Experiments: 2-D and 3-D Force Systems, Structural Analysis, Shear Force and Bending Moment Diagrams, Friction
Directed Study	Response and Reflection to Videos: Applications of Statics, Structures in the Real World
Discussion	Problem Solving Techniques, Statics vs Dynamics
Lecture	Presentation of course material

Instructor-Initiated Online Contact Types

Announcements/Bulletin Boards
Chat Rooms
Discussion Boards
E-mail Communication
Video or Teleconferencing

Student-Initiated Online Contact Types

Chat Rooms
Discussions
Group Work

Course design is accessible

Yes

Methods of Evaluation

Methods of Evaluation

Types	Examples of classroom assessments
Exams/Tests	Multiple Choice Questions, Conceptual Questions, and Numerical Problems Final Exam -- Multiple Choice Questions, Conceptual Questions, and Numerical Problems

Projects	Structures in the Real World, Applications of Statics
Homework	Textbook problems, Problems from handouts
Lab Activities	Pre-labs, Execution of labs, Lab Reports

Assignments

Reading Assignments

Sample Reading Assignment

1: Read Section 7.1 - Internal Forces Developed in Structural Members Sample Reading Assignment

2: Read Section 8.4 - Frictional Forces on Screws

Writing Assignments

Complete Laboratory Reports, Responses and Reflection to Applications of Statics

Outside-of-Class Assignments

Homework Problems

Sample Problem 1: Two particles have a mass of 8 kg and 12 kg, respectively. If they are 800 mm apart, determine the force of gravity acting between them. Compare this result with the weight of each particle.

Sample Problem 2: A chain is suspended between points at the same elevation and spaced a distance of 60 ft apart. If it has a weight per unit length of 0.5 lb/ft and the sag is 3 ft, determine the maximum tension in the chain.

SECTION F - Textbooks and Instructional Materials

Material Type

Textbook

Author

R.C. Hibbeler

Title

Engineering Mechanics Statics

Edition/Version

15th

Publisher

Pearson

Year

2022

ISBN #

9780134814971

Material Type

Textbook

Author

Michael Plesha, Gary Gray, Robert J. Witt, and Francesco Costanzo

Title

Engineering Mechanics: Statics

Edition/Version

3rd

Publisher

McGraw Hill

Year

2023

ISBN #
9781264975532

SECTION G - Diversity, Equity and Inclusivity

How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?
TBD

Course Codes (Admin Only)

CB00 State ID
CCC000310891

CB10 Cooperative Work Experience Status
N - Is Not Part of a Cooperative Work Experience Education Program

CB11 Course Classification Status
Y - Credit Course

CB13 Special Class Status
N - The Course is Not an Approved Special Class

CB23 Funding Agency Category
Y - Not Applicable (Funding Not Used)

CB24 Program Course Status
Not Program Applicable

Allow Pass/No Pass
No

Only Pass/No Pass
No