Statics Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: ENGR
Course and Section #: 2010-003
Course Title: Statics
Credits: 3

Course Description

Teaches principles of engineering mechanics as applied to bodies at rest. Discusses the concepts of position and force vectors, free body diagrams, equilibrium, center of gravity, centroids, distributed loading, friction, area and mass moments of inertia. Applies principles learned in the analysis of trusses, frames and machines.

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Paul McMullin

Student Learning Outcomes

1. Explain the difference between scalar and vector quantities.
2. Use vectors to represent forces and moments in static equilibrium problems.
3. Perform mathematical operations on vector quantities and equations.
4. Explain Newton's law for static equilibrium.
5. Establish conditions for static equilibrium of rigid bodies.
6. Solve structural analysis problems.
7. Analyze internal forces in structural members to draw shear and moment diagrams.
8. Solve static equilibrium problems that involve friction forces.
9. Calculate centroid, center of gravity, and Moment of Inertia of an object.

Course Materials and Texts

Vector Mechanics for Engineers: Statics, by F.P. Beer, E.R. Johnston, D.F. Mazurek, McGraw-Hill, 12th Ed.

Course Requirements

Course Assignments, Assessments, and Grading Policy

See the rubric for each assignments for a detailed understanding of what is expected. Assignments close at 11:59pm, the day they are due. I accept all late work. However, I do not grade or record it.

Tue Jan 7, 2025	Assignment Unit Conversion Review Homework (Not on Connect - hand submission only)
Mon Jan 13, 2025	Assignment Chapter 1. Introduction Assignment How to Use Connect
Tue Jan 14, 2025	Assignment Sub 1--2Day Statics Overview
Wed Jan 15, 2025	Assignment Chapter 2. Statics of Particles
Tue Jan 21, 2025	Assignment HW 2.1-Adding Planar Forces
	Assignment Section 2.1 Homework - Handwritten Work Submission
Thu Jan 23, 2025	Assignment HW 2.2-Add Vectors by Components
	Assignment Section 2.2 Homework - Handwritten Work Submission
Tue Jan 28, 2025	Assignment HW 2.3-Force & Equilib in Plane
	Assignment Section 2.3 Homework - Handwritten Work Submission
Wed Jan 29, 2025	Assignment Chapter 3: Rigid Bodies: Equivalent Systems of Forces
Thu Jan 30, 2025	Assignment HW2.4-2.5-3D Add Force & Equilib
	Assignment Section 2.4-2.5 Homework - Handwritten Work Submission
Mon Feb 3, 2025	Assignment Section 3.3 Homework - Handwritten Work Submission
Tue Feb 4, 2025	Assignment HW 3.1- 2D Moments
	Assignment Section 3.1 Homework - Handwritten Work Submission
Thu Feb 6, 2025	Assignment HW 3.2- 3D Moments, Point
	Assignment Section 3.2 Homework - Handwritten Work Submission
Tue Feb 11, 2025	Assignment HW3.3-3D Moments Axis
Wed Feb 12, 2025	Assignment Chapter 4: Equilibrium of Rigid Bodies
Thu Feb 13, 2025	Assignment HW 3.4- Simplify Force & Moment
	Assignment Section 3.4 Homework - Handwritten Work Submission
Tue Feb 18, 2025	Assignment Section 4.1 Homework - Connect
	Assignment Section 4.1 Homework - Handwritten Work Submission
Thu Feb 20, 2025	Assignment Section 4.2 Homework - Connect
	Assignment Section 4.2 Homework - Handwritten Work Submission
Tue Feb 25, 2025	Assignment Section 4.3 Homework - Handwritten Work Submission
Wed Feb 26, 2025	Assignment Chapter 6: Analysis of Structures
Thu Feb 27, 2025	Assignment Section 4.3 Homework - Connect
Tue Mar 4, 2025	Assignment Section 6.1 Homework - Connect
	Assignment Section 6.1 Homework - Handwritten Work Submission
Thu Mar 6, 2025	Assignment Section 6.2 Homework - Connect
	Assignment Section 6.2 Homework - Handwritten Work Submission
Mon Mar 17, 2025	Assignment Chapter 5: Distributed Forces: Centroids and Centers of Gravity
Tue Mar 18, 2025	Assignment Section 6.3 Homework - Connect
	Assignment Section 6.3 Homework - Handwritten Work Submission
Thu Mar 20, 2025	Assignment Section 5.2 & 5.4 Homework - Connect
	Assignment Section 5.2 & 5.4 Homework - Handwritten Work Submission
Tue Mar 25, 2025	Assignment Section 5.2 (Part 2) Homework - Connect

	Assignment Section 5.2 (Part 2) Homework - Handwritten Work Submission
Wed Mar 26, 2025	Assignment Chapter 9: Distributed Forces: Moments of Inertia
Thu Mar 27, 2025	Assignment Section 5.1, 5.3 & 5.4 Homework - Connect
	Assignment Section 5.1, 5.3 & 5.4 Homework - Handwritten Work Submission
Mon Mar 31, 2025	Assignment Chapter 7: Internal Forces and Moments
Tue Apr 1, 2025	Assignment Section 9.2 Homework - Connect
	Assignment Section 9.2 Homework - Handwritten Work Submission
Thu Apr 3, 2025	Assignment Section 7.1 Homework - Connect
	Assignment Section 7.1 Homework - Handwritten Work Submission
Tue Apr 8, 2025	Assignment Section 7.2 Homework - Connect
	Assignment Section 7.2 Homework - Handwritten Work Submission
Thu Apr 10, 2025	Assignment Design Project
	Assignment Section 7.3 Homework - Connect
	Assignment Section 7.3 Homework - Handwritten Work Submission
Mon Apr 14, 2025	Assignment Chapter 8: Friction
Thu Apr 17, 2025	Assignment Section 8.1 Homework - Connect
	Assignment Section 8.1 Homework - Handwritten Work Submission
Tue Apr 22, 2025	Assignment Sub 2--Beam Design
Fri Apr 25, 2025	Assignment Sub 3--Class Summary

Required or Recommended Reading Assignments
See above.

General Description of the Subject Matter of Each Lecture or Discussion

DAY	DATE	SUBJECT
1	January 7	Class Intro, M1 Video, 2-Day Statics O'View
2	January 9	2-Day Statics O'View
	January 14	1.1-1.6—Introduction, M2 Video & Activity
3	January 16	2.1—Addition of Planar Forces
4	January 21	2.2—Adding Vectors/Forces by Components
5	January 23	2.3—Forces and Equilibrium in a Plane
6	January 28	2.4-2.5—Adding Forces and Equilibrium in Space
7	January 30	3.1—2D Moments & Couples
8	February 4	3.2—3D Moments about a Point
9	February 6	3.3—3D Moments about an Axis & Couples
10	February 11	3.4—Simplifying Systems of Forces
11	February 13	4.1—Equilibrium in Two Dimensions
	February 18	4.2—Two Special Cases
12	February 20	4.3—Equilibrium in Three Dimensions
13	February 25	4.3—Equilibrium in Three Dimensions
14	February 27	6.1—Trusses, Method of Joints, M4 Video
	March 4	6.2—Trusses, Method of Sections
	March 6	6.3—Frames & Machines
15	March 11	NO CLASS Spring Break
16	March 13	NO CLASS Spring Break

17	March 18	5.2 & 5.4—Centers of Gravity and Centroids by Integration
18	March 20	5.2—Theorems of Pappus and Guldinus
19	March 25	5.1 & 5.3—Centers of Gravity and Centroids by Composite Methods
20	March 27	9.1 & 9.2—Moments of Inertia of Areas
21	April 1	7.1—Internal Forces in Members
22	April 3	7.2—Beams, M5 Video
23	April 8	7.3—Relations Among Load, Shear, and Bending Moment
24	April 10	Paper Beam Design
25	April 15	8.1—The Laws of Dry Friction + Problem Session
26	April 17	Test Paper Beams
27	April 22	Review

Required Course Syllabus Statements

Generative AI
You can use AI however you like. Confirm its accuracy by hand calculations.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation
UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.