Master 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 #: 2010-04
Course Title: Engineering 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. Lab access fee of $45 for computers applies. Canvas Course Mats $85/McGraw applies.

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: Professor Joshua Fernquist

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

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

Text (required) —*Vector Mechanics for Engineers: Statics*, by F.P. Beer, E.R. Johnston, D.F. Mazurek, McGraw-Hill, 12th Ed.

-
    - An electronic version of the textbook is **included** with class registration and is available through Canvas and/or McGraw-Hill's online component. If desired, a reduced-price, loose-leaf hardcopy of the textbook is also available through BookMatch at my.uvu.edu/bookmatch

Text (optional) —*Engineering Mechanics, Statics, by R.C. Hibbeler, Pearson, 14th Ed.*

Course Requirements

Course Assignments, Assessments, and Grading Policy

Class Attendance

An in-person format will be used for class time which will be conducted during the scheduled class time and used to discuss statics principles, answer questions and work through example problems. It is expected that you will be prepared for each class by reading the assigned sections and being ready to actively participate in the in-person lectures.

Homework

An important part of learning to solve statics problems is to **practice** solving statics problems. Doing problems will help you become proficient with the many principles we will learn. The homework is also an opportunity to practice your technical communication skills through the calculations you will perform.

- Problems will be assigned each class. Most, if not all, will use the online interactive McGraw-Hill Connect component available with this textbook and accessed through Canvas.
- All work (including assignments using Connect) should be completed on paper. You will submit this work for credit. See the Calc Layout Download Calc Layout sheet for an example of how this should look.
- All solutions should represent your own work and must be complete and clear.
- *It is strongly encouraged to find a partner or group to study with for this course.*
- Late homework will not be accepted for this course.

Reading Quizzes

A part of coming to class prepared is reading the section/topic material before it is covered in class. Reading quizzes will be given to be completed prior to the day that material will be covered in class. This will typically consist of short comprehension quizzes that will be completed with the online McGraw-Hill Connect resource. **Quizzes cannot be made up or submitted late.**

Exams

There will be one mid-term exam and one final exam to help you determine if you have achieved the course learning objectives.

Design Project

Near the end of the semester, you will be given a design problem and asked to apply what we have learned in class this semester to solve this hypothetical problem. This project will require you to analysis a problem, complete calculations, then report back your results in a professional manner to the instructor.

Grading Scale:

The following grading standards will be used in this class:

Grade	**Percent**	**Grade**	**Percent**
A	94-100	C	73-76
A-	90-93	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	E	0-59

Assignment Categories

Assignment Categories

Activity	**Percent**
Class Participation	5%
Reading Assignments	10%
Homework	30%
Exams	40%
Design Project	15%

Required or Recommended Reading Assignments

All readings will be assigned from the course textbook.

General Description of the Subject Matter of Each Lecture or Discussion

- Chapter 2: Vectors and Scalers

- Chapter 3: Moments and Couples
- Chapter 4: Equilibrium in 2D and 3D
- Chapter 6: Trusses and Frames
- Chapter 5: Centers of Gravity and Centroids
- Chapter 9: Moments of Inertia
- Chapter 7: Beams and Internal Forces
- Chapter 8: Laws of Dry Friction

Required Course Syllabus Statements

Generative AI
This course requires you to complete assignments that assess your understanding and application of the material. You are expected to do your own work, and the use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is strictly prohibited for any part of your assignments. Using these tools will be considered academic dishonesty and will be handled according to the university's policy. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

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.