

South Plains College
Common Course Syllabus: ENGR 2301
Revised December 2022

Department: Mathematics, Engineering, and Computer Science

Discipline: Engineering

Course Number: ENGR 2301

Course Title: Engineering Mechanics - Statics

Available Formats: hybrid

Campuses: Levelland

Course Description: Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; and moments of inertia.

Prerequisite/Corequisite: Successful completion of 'C' or better in PHYS 2425 and enrollment in MATH 2414

Credit: 3 Lecture: 3 Lab: 1

Textbook: Please refer to the instructor's course syllabi

Supplies: Please see the instructor's course information sheet for specific supplies.

This course partially satisfies a Core Curriculum Requirement: None

Core Curriculum Objectives addressed:

- Communications skills—to include effective written, oral and visual communication
- Critical thinking skills—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Empirical and quantitative competency skills—to manipulate and analyze numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes: Upon completion of this course and receiving a passing grade, the student will be able to:

1. State the fundamental principles used in the study of mechanics.
2. Define magnitude and directions of forces and moments and identify associated scalar and vector products.
3. Draw free body diagrams for two- and three-dimensional force systems.
4. Solve problems using the equations of static equilibrium.
5. Compute the moment of force about a specified point or line.
6. Replace a system of forces by an equivalent simplified system.

7. Analyze the forces and couples acting on a variety of objects.
8. Determine unknown forces and couples acting on objects in equilibrium.
9. Analyze simple trusses using the method of joints or the method of sections.
10. Determine the location of the centroid and the center of mass for a system of discrete particles and for objects of arbitrary shape.
11. Analyze structures with a distributed load.
12. Calculate moments of inertia for lines, areas, and volumes.
13. Apply the parallel axis theorem to compute moments of inertia for composite regions.
14. Solve problems involving equilibrium of rigid bodies subjected to a system of forces and moments that include friction.
15. Solve problems involving dry sliding friction, including problems with wedges and belts.

Student Learning Outcomes Assessment: A pre- and post-test questions will be used to determine the extent of improvement that the students have gained during the semester

Course Evaluation: There will be departmental final exam questions given by all instructors.

Attendance/Student Engagement Policy: Attendance and engagement are the most critical activities for success in this course. The instructor maintains records of the student's attendance and submission of assignments throughout the semester. The student is expected to attend at least eighty percent (80%) of the total class meetings and submit at least eighty percent (80%) of the total class assignments to have the best chance of success. If the student fails to meet these minimum requirements, the instructor may remove the student from the class with an X, upon their discretion, to help the student from harming their GPA. If the student can not receive an X, the instructor will assign an F.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain an unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;

8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect from the student and the instructor. Neither the instructor nor the student should be subject to others' rude, disruptive, intimidating, aggressive, or demeaning behavior. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

South Plains College policies concerning diversity, disabilities, non-discrimination, Title IX Pregnancy Accommodations, and Campus Concealed Carry Statements can be found here: <https://www.southplainscollege.edu/syllabusstatements/>.

South Plains College policies, return to campus plan, and protocols regarding COVID-19 can be found here: <https://www.southplainscollege.edu/emergency/covid19-faq.php>.

SPC Bookstore Price Match Guarantee Policy: If you find a lower price on a textbook, the South Plains College bookstore will match that price. The difference will be given to the student on a bookstore gift certificate! The gift certificate can be spent on anything in the store.

If students have already purchased textbooks and then find a better price later, the South Plains College bookstore will price match through the first week of the semester. The student must have a copy of the receipt and the book has to be in stock at the competition at the time of the price match.

The South Plains College bookstore will happily price match BN.com & books on Amazon noted as *ships from and sold by Amazon.com*. Online marketplaces such as *Other Sellers* on Amazon, Amazon's Warehouse Deals, *fulfilled by Amazon*, BN.com Marketplace, and peer-to-peer pricing are not eligible. They will price match the exact textbook, in the same edition and format, including all accompanying materials, like workbooks and CDs.

A textbook is only eligible for price match if it is in stock on a competitor's website at time of the price match request. Additional membership discounts and offers cannot be applied to the student's refund.

Price matching is only available on in-store purchases. Digital books, access codes sold via publisher sites, rentals and special orders are not eligible. Only one price match per title per customer is allowed.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

TexBook Program: *This course is in the SPC TexBook program, so you do not need to purchase a textbook or access code for this course.*

- **What is TexBook?** The required textbook/digital content for this course is available to you in Blackboard from the first day of class. The charge for the textbook/digital content is the lowest price available from the publisher and bookstore and is included in your tuition.
- **How do I access my TexBook?** Your course material is in your Blackboard course from the first day of class. Access to your course material is provided either by

VitalSource or other links inside your Blackboard course. VitalSource (and many publisher's) eBook features include the ability to hear the text read aloud, highlight, take notes, create flash cards, see word definitions, build study guides, print select pages, and download 100% of the book for offline access.

- **Help with TexBook issues and support:** check with your professor or visit: <https://support.vitalsource.com/hc/en-us/requests/new> (available 24/7 via chat, email, phone, and text)
- **Opting out of TexBook:** Participating in TexBook is not mandatory, and you can choose to opt out. However, by opting out you will lose access to the course textbook/digital content and competitive pricing, and you will need to purchase the required course material on your own. If you drop the class or opt-out before the opt-out deadline, the TexBook fee will be automatically refunded to your SPC account. The opt-out deadline for Fall and Spring is the twelfth class day. The opt-out deadline for shorter terms varies between the second and third class day.

Please consult with your professor before deciding to opt-out.* If you still feel that you should purchase the course textbook/materials on your own, send an **opt-out email to **pwells@texasbook.com**. Include your first name, last name, student ID number, and the course you are opting out of. Once you have been opted-out, you will receive a confirmation email. If you need assistance with the process, contact the SPC Bookstore:

Email: pwells@texasbook.com / **Phone:** 806-716-2097

Email: agamble@texasbook.com / **Phone:** 806-716-4610

The primary objective of this course is to develop a thorough understanding of the action of forces on objects at rest. The knowledge that you gain in this course will be important in many areas of engineering, particularly in structural engineering. By the end of the semester, you should be able to draw free body diagrams; determine the point of action, direction, and magnitude of all external forces on a wide variety of physical objects and structures; determine the resultant force necessary to maintain the object in equilibrium; and calculate the internal forces on a wide variety of structural objects, including trusses, frames, machines, and beams. Calculate centroids, centers of mass, and mass moments of inertia. A second and equally important objective of this course is to develop broad engineering skills. Engineering requires the mastery of complex concepts and development

of critical thinking and problem solving skills. While these skills come naturally to some people, most of you will need to learn, develop, and practice techniques to enhance your ability to learn and apply engineering concepts. The skills that you develop and sharpen in this course may improve your performance in future engineering courses and determine your eventual success as a practicing engineer.

HOMEWORK: Access through Blackboard.

Week No	Date	Topic
1	8/25, Tue	Introduction, Chapter 1
	8/27, Thu	Chapter 2
2	9/1, Tue	Chapter 2
	9/3, Thu	Chapter 2
3	9/8, Tue	Chapter 2
	9/10, Thu	Chapter 2
4	9/15, Tue	EXAM #1
	9/17, Thu	Chapter 3
5	9/22, Tue	Chapter 3
	9/24, Thu	Chapter 3
6	9/29, Tue	Chapter 3
	10/1, Thu	Chapter 3
7	10/6, Tue	Chapter 3
	10/8, Thu	Chapter 4
8	10/13, Tue	EXAM #2
	10/15, Thu	Chapter 4
9	10/20, Tue	Chapter 4
	10/22, Thu	Chapter 4
10	10/27, Tue	Chapter 4, Quiz #2 (Time permitting)
	10/29, Thu	Chapter 5
11	11/3, Tue	Chapter 5
	11/5, Thu	Chapter 5
12	11/10, Tue	EXAM #3
	11/12, Thu	Chapter 6
13	11/17, Tue	Chapter 6
	11/19, Thu	Chapter 6
14	11/24, Tue	Chapter 6
	11/26, Thu	Thanksgiving Break
15	12/1, Tue	Chapter 7
	12/3, Thu	Chapter 7, Chapter 8
16	12/8, Tue	FINALS

NOTE: The Schedule given below is only a guideline. Please follow instructions in class.