ENGR 2301 – Engineering Mechanics: Statics

Course Times & Classroom:

- Asynchronous online
- No in-person meeting

Professor: Dr. Chi Tian

Email: ctian@uttyler.edu (Preferred communication method)

Office Hours: by appointment (via Zoom)

Course Dates: June 2nd, 2025 – July 5th,2025

Teaching Assistant: TBD

Email Policy

- Please use the following format for your email subject line: [ENGR 2301 + HW#/Exam#/Lecture#].
- Practice writing professional emails in this class, as it is an essential skill for the job market.
- I will respond as soon as possible, but please allow up to 2 business days for a reply.

AI Policy:

- You can only use AI for grammar checking for this course assignment.
- You need to clearly acknowledge the use of AI in your homework.

Course Overview

Welcome to ENGR 2301 (Statics), the first of three courses you may take in Engineering Mechanics (Statics, Dynamics, and Mechanics of Materials). During the upcoming semester, I believe you will find our study of Statics to be interesting, challenging, and rewarding. It is a basis from which all of the rest of your engineering coursework will be derived, so learn it well.

In this course, you will learn that fundamental Statics is concerned with the analysis of loads (forces, torques/moments) on physical systems in static equilibrium, that is, in a state where the relative positions of subsystems do not vary over time, or where components and structures are at rest under the action of external forces of equilibrium. When in static equilibrium, the system is either at rest or moving at constant velocity through its center of mass. You will be applying the principles from previous math and physics courses throughout this course. In addition, our goal is to provide you with a solid foundation in understanding equilibrium and statics for application in future courses.

Student Learning Outcomes

In this course, you will learn to:

1. Develop an organized approach to solving engineering mechanics (statics) problems
2. Apply the general principles of engineering mechanics (statics) to solving problems
3. Apply the equations of equilibrium to solve static problems
4. Solve structural analysis problems for simple trusses using method of joints
5. Solve structural analysis problems for simple trusses using method of sections
6. Calculate the internal forces (shear and bending moment) in a simply supported beam
7. Calculate static friction forces on an object
8. Find the center of gravity and centroid of an object
9. Calculate the Moment of Inertia of an object
10. Draw and use a Free-Body-Diagram in order to solve engineering mechanics problems.
11. Communicate using the terminology of engineering mechanics (statics)

Prerequisite/Co-Requisite

1. PHYS 2325 University Physics I
2. PHYS 2125 University Physics I Laboratory
3. MATH 2414 Calculus II

Textbooks and Readings

No required textbook. The recommended textbook used for this class is:

- Engineering Mechanics: Statics & Dynamics, Fourteenth Edition by R. C. Hibbeler, 2015, ISBN 978-0133915426

Grading

Contributions towards final grade (out of 100%)

- 5% Professional Practice (3 Videos)
- 20% Homework
- 25% Exam 1
- 25% Exam 2
- 25% Final Examination

Letter grades will be assigned based on the final course grade:

- A 90 and above
- B 80 to 89.99
- C 70 to 79.99
- D 60 to 69.99
- F below 60

Grading Policies

Late submissions: It is a basic principle of professionalism that "Professionals are not late". Deductions to your assignments grade for late submission will be given as follows:

- 0-24 hours late a deduction of 25% of the earned grade
- 24-48 hours late a deduction of 50% of the earned grade
- More than 48 hours late **No credit**

No letter grade will be released until it is official on PeopleSoft.

In consistency with the College of Engineering's policy, a student who does not score 50% or more of the total points allocated to the Final Examination will automatically receive an F grade

Professional Practice

You must watch three professional practice videos to receive full credit for the professional practice portion of your grade in this course. The videos are already posted to Canvas under the Professional Practice Assignment. When you watch a video, you are expected to complete the template Word file and discuss what you learned. The template can also be found on Canvas.

Exams

All exams are closed book. You are only allowed to bring your writing instruments, erasers, and NCEES-approved calculators. Topics to be tested will be announced in class and on Canvas one week prior to the exam.

The instructor will set questions from material taught in class. The meaning of "taught in class" includes verbal instructions or written notes on the white board and Canvas, briefing/ presentation during field trips, observation during field work/ experiments. They do not necessary appear in the textbook, distributed class notes, or homework. It is very important that you attend the class activities and take additional notes.

To discourage students from focusing narrowly on only a few questions, **no** practice exam will be given. There are enough self-practice problems in the textbook at the end of each chapter.

Calculators

In line with the Civil Engineering Department's policy, only calculators permitted by NCEES for use in the current semester's FE exam are permitted to be used in the ENGR 2301 examinations. No other model of calculator will be allowed. Models previously allowed by NCEES in the past but are no longer valid for the current FE exam are prohibited in the ENGR 2301 exams. Please check www.ncees.org for the latest permitted calculator models. Examples include, but are not limited to:

- Hewlett Packard: HP 33s, HP 35s, and no others
- Casio: All FX 115 models
- Texas Instruments: All TI30X or TI-36X models

It is the student's responsibility to check the validity of his/her calculator model, purchase, and be familiar with the functions of the permitted calculators prior to the exam. At the discretion of the course instructor, any calculator not meeting the requirements stated (especially in the case of a graphing calculator) may be used but only after an inspection of the device and a clearing of all the memory within the device, performed for the instructor at a time immediately prior to the exam. At any time during the exam, your

calculator is subject to a random search by the instructor. Failure or refusal to clear all memory or to surrender your calculator to search will disqualify you from the exam immediately, unless you can produce a calculator meeting the requirements as stated above. No borrowing of other students' calculators is allowed during exam.

Homework

About 60 - 70 homework problems will be assigned out of the textbook. The homework problems will be assigned at the completion of a topic and will be due in class on the day stated in the course schedule.

In all your homework and exam solutions, you are expected to present, in written form, the formulae used, the variable values, intermediate calculations, final answers, and their units. Draw a box around your final answer. Not having any of the above will lead to points being deducted.

Tentative Schedule

Lesson	Date	Topic	Textbook	HW Assigned	HW Due
Week 1					
1	06/02	Course Introduction		HW 0	
2	06/02	Force Vectors	1.1 – 1.6 2.1 – 2.4	HW1	
3	06/03	3D Vectors	2.5 – 2.8		HW0
4	06/04	Dot Product	2.9		
5	06/04	Cross Product	4.2	HW2	HW1
6	06/05	Particle Equilibrium	3.1-3.3		
7	06/06	Particle Equilibrium in 3D	3.4	HW3	HW2
Week 2					
8	06/09	Force Systems	4.1-4.5		
9	06/09	Moments About an Axis	4.1-4.5		
10	06/10	Couples and Equivalent Systems	4.6-4.8	HW4	HW3
11	06/11	Equilibrium of Rigid Bodies	5.1-5.2		
12	06/12	Equilibrium of Rigid Bodies in 2D	5.3-5.4	HW5	HW4
13	06/13	Exam I Review			
Week 3					
	06/16	**Exam I (6:00 – 7:50 pm via Zoom)**			
14	06/17	Truss Analysis: Method of Joints	6.1-6.3		
15	06/18	Truss Analysis: Method of Sections	6.4	HW6	HW5
16	06/19	Frames and Machines	6.6		
17	06/20	Internal Forces	7.1	HW7	HW6
Week 4					
18	06/23	Shear and Moment Diagrams	7.2-7.4		
19	06/24	Shear and Moment Diagrams	7.2-7.4	HW8	HW7
20	06/25	Friction Basics	8.1-8.2		
21	06/26	Multiple Surfaces and Belts	8.3-8.5	HW9	HW8
22	06/27	Centroids	9.1		
Week 5					

23	06/30	Composite Bodies	9.2	HW10	HW9
24	06/30	Exam II Review			
	07/01	**Exam 2 (6:00 – 7:50 pm via Zoom)**			
25	07/02	Moments of Inertia and Parallel Axis Theorem	10.1-10.2		HW10
26	07/02	Final Exam Review			
	07/03	**Final Exam (Take-Home, 24 Hours)**			

Resources available to UT Tyler Students

- UT Tyler Counseling Center (available to all students)
- MySSP App (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- Student Assistance and Advocacy Center
- Military and Veterans Success Center (supports for our military-affiliated students)
- UT Tyler Patriot Food Pantry
- UT Tyler Financial Aid and Scholarships
- UT Tyler Student Business Services (pay or set up payment plans, etc.)
- UT Tyler Registrar's Office
- Office of International Programs
- Title IX Reporting
- Patriots Engage (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class

Students may withdraw (drop) from this course using the Withdrawal Portal. Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully read the implications for withdrawing from a course and the instructions on using the Withdrawal portal..

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped includes those from other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. **CAUTION #1**: Withdrawing before census day does not mean you get a full refund. Please see the Tuition and Fee Refund Schedule. **CAUTION #2**: All international students must check with the Office of International Programs before withdrawing. All international students are required to enroll full-time for fall and spring terms. **CAUTION #3:** All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. CAUTION #4: All veterans or military-affiliated students should consult with the Military and Veterans Success Center.

* Students who began college for the first time before 2007 are exempt from this law.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to

honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. *Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).*

Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade *only when **all** of the following conditions are met*: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.
The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was

issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the Registrar's Form Library.

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler/ and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at https://www.uttyler.edu/disability-services, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, or call 903.566.7079."

Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The Military and Veterans Success Center (MVSC) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.
- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.
- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the Student Conduct and Discipline policy in the Student Manual Of Operating Procedures (Section 8).

FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in University Policy 5.2.3. The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities

This course follows the practices related to Excused Absences for University Events or Activities as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to Excused Absences for Religious Holy Days as noted in the Catalog.

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the Pregnant and Parenting Self-Reporting Form.

Campus Carry

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php.