The University of Texas at Tyler
Department of Civil Engineering

ENGR 2301: Engineering Mechanics: Statics

Course Syllabus (Fall 2024)

Date: August 19, 2024. This version supersedes all earlier versions.

Time & Venue	Class times: TR, 9:30 a.m. – 10:50 a.m., RBN 3039
Instructor	Dr. Matthew Vechione Office: RBS 1011 Email: mvechione@uttyler.edu Phone: (903) 565-5711 Office hours: MWF 10:00 a.m. – 11:00 a.m. or by appointment
Teaching Assistant	Name: TBD
Course Website	See UT Tyler's Canvas website. Canvas will be used to manage the course material for the semester. There you will find announcements, homework assignments, solutions, handouts, lesson videos, and other material pertaining to the class. **Please check there regularly.**
Catalog Description	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.

Course 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; and 3. MATH 2414 Calculus II
Required Text	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 Student Organization Meetings) • 15% Project • 15% Homework • 20% Exam 1 • 20% Exam 2 • 25% Final Examination **Note:** There will be no makeup work or extra credit allowed/granted at the end or during the semester unless allowed/granted to everyone by the instructor. All assignments must be turned in at the appropriate time to receive credit. 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 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 attend **three professional practice meetings** to receive full credit for the professional practice portion of your grade in this course. You can attend ASCE, ITE, CMSA, IEEE, ASME, SAE, etc. student chapter meetings or when these student chapters host guest speakers. When you attend a meeting, you are expected to complete the template Word file and take a picture of yourself at the meeting as proof of your attendance. The template can be found on Canvas.
Exams	There will be 2 midterm examinations (held during the scheduled class time) and one final examination. The exams are **TENTATIVELY** scheduled for: • Exam 1: October 10th • Exam 2: November 21st • Final Exam: December 12th Exams dates may be moved up or pushed back depending on the progress of the lectures. You can use a calculator and instructor-approved reference material. Solutions to exams will **NOT** be posted. No make-up exams will be given except for medical or other similar hardships where advanced arrangements are made with the instructor; or in case of non-selective medical emergencies with appropriate physician's note or documentation. Other than circumstances described above, failure to take the exam at the scheduled time will constitute a grade of zero on the exam.
General Exam Rules & Cheat Sheet	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.
Field Trip	To be announced/decided.
Design Project	The design project involves your participation in the Ratliff Relay (cardboard canoe, bottle rocket, robotics, etc.). You will be assigned into groups of 4 – 5 based on your major (i.e., Civil, Mechanical, Electrical, Chemical). More details concerning the project can be found on Canvas.
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. **Homework will be uploaded to Canvas as a single Word document (.doc or docx) or PDF.** All homework solutions **must** be submitted on engineering paper (you can buy them in the Civil Engineering Department Office for $5.00, at Office Depot, or online). Homework solutions not submitted on engineering paper will received only 90% of the graded credit. 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.

Late Homework/ Assignment Policy	Absolutely **NO** late homework will be accepted. If it is not uploaded to Canvas before the submission window closes, I will not grade it, and you will receive a zero for the assignment. No exceptions. Homework solutions are usually posted on Canvas two days after the due date.
Grace Day Coupon	**ENGR 2301 Homework Grace Day Coupon** To allow for emergencies that may arise, you may use this coupon for one "grace day" for homework.* In other words, one homework can be turned in 24 hours late without penalty. Cut out (or take a screenshot) of this coupon and submit in lieu of your homework assignment. *Not transferable to another student. *Only valid for homework assignments. *You are not required to use this coupon. If you do not use this coupon on a homework assignment, turn it in with your final exam for an additional 5 bonus points on the final exam.
Final Day to Withdraw	The final day to withdraw from the course without penalty is **November 4th.**
Census Dates	The university requires that instructors report the attendance to the Registrar's Office at various points in the semester. Therefore, on **September 10th.** I will report the attendance for the class.
UT Tyler Honor Code	Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.
Students' Rights and Responsibilities	To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php
Campus Carry	We respect the right and privacy of students 21 and over 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
UT Tyler: A Tobacco-Free University	All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

	There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.
Grade Replacement / Forgiveness and Census Date Policies	Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include: • Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit. • Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date) • Schedule adjustments (section changes, adding a new class, dropping without a "W" grade) • Being reinstated or re-enrolled in classes after being dropped for non-payment • Completing the process for tuition exemptions or waivers through Financial Aid State-Mandated Course Drop Policy
State-Mandated Course Drop Policy	Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

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 you have 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 Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.
Student Absence due to Religious Observance	Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.
Student Absence for University-Sponsored Events and Activities	If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time, the instructor will set a date and time when make-up assignments will be completed.
Social Security and FERPA Statement	It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.
Emergency Exits and Evacuation	Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.
Student Standards of Academic Conduct	Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. i. **"Cheating"** includes, but is not limited to: • copying from another student's test paper;

	• using, during a test, materials not authorized by the person giving the test; • failure to comply with instructions given by the person administering the test; • possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test; • using, buying, stealing, transporting, or soliciting in whole or part the contents of a non-administered test, test key, homework solution, or computer program; • collaborating with or seeking aid from another student during a test or other assignment without authority; • discussing the contents of an examination with another student who will take the examination; • divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student; • substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment; • paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program; • falsifying research data, laboratory reports, and/or other academic work offered for credit; • taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and • misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially. ii. **"Plagiarism"** includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit. iii. **"Collusion"** includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a

	violation of any section of the rules on scholastic dishonesty. iv. All written work that is submitted will be subject to review by plagiarism software.
UT Tyler Resources for Students	• UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu • UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu • The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses. • UT Tyler Counseling Center (903.566.7254)
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. For this course, AI is encouraged during the course, and appropriate acknowledgment is expected. You can use AI programs (ChatGPT, Copilot, etc.) in this course. These programs can be powerful tools for learning and other productive pursuits, including completing assignments in less time, helping you generate new ideas, or serving as a personalized learning tool. However, your ethical responsibilities as a student remain the same. You must follow UT Tyler's Honor Code and uphold the highest standards of academic honesty. This applies to all uncited or improperly cited content, whether created by a human or in collaboration with an AI tool. If you use an AI tool to develop content for an assignment, you must cite the tool's contribution to your work.

Tentative Schedule

Lesson	Date	Topic	Text	HW Assigned	HW Due
1	8/27	Course Introduction		Project	
2	8/29	Force Vectors	1.1 – 1.6 2.1-2.4	HW 1	
3	9/3	3D Vectors	2.5 – 2.8		
4	9/5	Dot Product	2.9		
5	9/10	Cross Product	4.2	HW 2	HW 1
6	9/12	Particle Equilibrium	3.1 – 3.3		
7	9/17	Particle Equilibrium in 3D	3.4	HW 3	HW 2
8	9/19	Force Systems	4.1-4.5		
9	9/24	Moments About an Axis	4.1-4.5		
10	9/26	Couples and Equivalent Systems	4.6 – 4.8	HW 4	HW 3
11	10/1	Equilibrium of Rigid Bodies	5.1 – 5.2		
12	10/3	Equilibrium of Rigid Bodies in 2D	5.3 – 5.4	HW 5	HW 4
13	10/8	Exam I Review			
	10/10	**Exam I**			
14	10/15	Truss Analysis: Method of Joints	6.1 – 6.3		
15	10/17	Truss Analysis: Method of Sections	6.4	HW 6	HW 5
16	10/22	Frames and Machines	6.6		
17	10/24	Internal Forces	7.1	HW 7	HW 6
18	10/29	Shear and Moment Diagrams	7.2 – 7.4		
19	10/31	Shear and Moment Diagrams	7.2 – 7.4	HW 8	HW 7
20	11/5	Friction Basics	8.1 – 8.2		
21	11/7	Multiple Surfaces and Belts	8.3 – 8.5	HW 9	HW 8
22	11/12	Centroids	9.1		
23	11/14	Composite Bodies	9.2	HW 10	HW 9
24	11/19	Exam II Review			
	11/21	**Exam II**			
	11/26	No Class (Thanksgiving)			
	11/28	No Class (Thanksgiving)			
25	12/3	Moments of Inertia and Parallel Axis Theorem	10.1 – 10.2		HW 10
26	12/5	Final Exam Review			
	12/12	**Final Exam**			