The University of Texas at Tyler
Department of Civil and Environmental Engineering

ENGR 2301 Engineering Mechanics: Statics

Course Syllabus (Spring 2020)

Date: January 10, 2020. This version supersedes all earlier versions.

Time & venue	Class times: TR, 8:00 a.m. – 9:20 a.m., RBN 2012
Instructor	Dr. Matthew Vechione Office: RBS 1011 Email: mvechione@uttyler.edu Phone: (903) 565-5711 Office hours: MTW 9:30 a.m. – 10:30 a.m.
Teaching assistant	TBD
Course website	See UT Tyler's Canvas Website
Course objective	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 course work 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.
Prerequisite/Co-requisite	1. PHYS 2325 University Physics I; 2. PHYS 2125 University Physics I Laboratory; and 3. MATH 2414 Calculus II
Required text	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 (ASCE/ASME Meetings)
	      25% Exam 1
	      25% Exam 2
	      25% Final examination
	      15% Homework
	      5% Project
	
	In grading the homework, assignments, tests, exams, etc., no credit will be given to methods **not** covered in this class, although these methods, tables, formulae may appear in the textbook. Errors or outdated material in the textbook should not be the reason for claiming full credit on work done.
	
	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.

Attendance	During some class meetings, the instructor will return the graded homework, assignments or exams towards the end of the meeting by calling names. Students who are not there to collect their work will be marked absent. To protect your confidentiality, graded homework, assignments, and exams will not be placed at open area for collection. They will only be distributed by the instructor during class or office hours. Graded homework, assignments, and exams not collected after the final exam week will be disposed according to UT Tyler policy.
Exams	Exams are given during the class times. The dates of the Exams will be announced at least one week advance in class.
Final Exam	**The Final Exam is on 4/28, 8:00 a.m. – 10:00 a.m.** All material covered in the course will be tested.
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, which are not required as part of each homework assignment as well as 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. 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. If an unapproved calculator is found during any exam, it will be taken away immediately and only be returned to the student after the exam. No borrowing of other students' calculators is allowed during exam.
Field trip	To be announced/decided.
Design Project	The design project involves the use of the West Point Bridge Designer (WPBD) to design a truss bridge. You will do this project individually. A written report must be submitted as well as some outputs from the WPBD software.
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 homework sheet and course schedule. Only selected homework problems will be graded. 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), stapled at the top-left corner. 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. Do not expect all the homework problems be similar to the examples covered during class time. In some cases, you are expected to read additional examples in the text book or think of the solution yourself or discuss with your classmates.
Late homework/ assignment policy	Absolutely **NO** late homework will be accepted. If it is not in my hands when I leave the classroom on the due date, 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.
Re-schedule of examination	There is no make-up or rescheduling of the Final Examination. Make-up for the Exams will only be arranged if you inform the instructor **prior** to or on the day **before** the exam, with a strong valid reason. Examples of strong valid reasons are official UT Tyler travel, accident, illness, child-birth, passing of an immediate family member, jury duty, or court appearance. These are not expected and cannot be rescheduled. You will be required to show documentary evidence for the valid reason (e.g., doctor's letter, police report, court letter). Events that can be pre-scheduled or rescheduled are not considered valid reasons. Examples of non-valid reasons are traffic, wedding, driving test, sending car for service, clash with another course schedule, etc. Job interviews will be considered on a case by case basis (again, with documentary evidence). If an emergency happens during the exam day, you should contact the instructor at the earliest possible time (or call the Civil Engineering office, contact one of your classmates or TA who will then inform the instructor). Any make-up exam will be given on the Dead Day. Each student is only allowed one (1) make-up exam. That is, he/she can only make-up Exam 1 or Exam 2, but not both. To compensate for the fact that you may apply what you learn in the entire course when answering make-up Exams 1 or 2, the make-up exam will be more difficult than the original exam. Students who fail to show up for the make-up or final exam with an invalid reason will be given 0 points for that exam; or for a valid reason an incomplete "I" grade. He/she must take the exam the next time this course is being offered to have the "I" grade change to a letter grade. All the

	assessment components and marks will be retained for the calculation of the final letter grade. The letter grade will be benchmarked against the same class for the semester in which the exam had been missed.
Collaboration/ cheating	Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper without giving credit to the source of that information or wording: it is also not acceptable. Do not submit work under your name that you did not do yourself. You may not submit work for this class that you did for another class. If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UT Tyler catalog policy.
Audio/video recording	Recording of class instructions by any phone, audio or video device is not permitted. The only exception is at the request of Student Accessibility and Resources, or at the request of Department, College, or University for teaching evaluation.
Phone/iPod/iPad, laptop, etc.	Please turn off your cell phone or switch it to silent mode during class time. If you need to answer a phone call, please leave the class quietly and only answer outside the class door. You are not allowed to answer any phone calls during the examination.
Disability	In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA), and the ADA Amendments Act (ADAAA), the University of Tyler at Texas offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a 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 an Accessibility Case Manager. 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.

Tentative Schedule

Lesson	Date	Topic	Text	HW Assigned	HW Due
1	1/14	Course Introduction			
2	1/16	Force Vectors	1.1 – 1.6 2.1-2.4	HW1	
3	1/21	3D Vectors	2.5 – 2.8		
4	1/23	Dot Product	2.9		
5	1/28	Cross Product	4.2	HW2	HW1
6	1/30	Particle Equilibrium	3.1 – 3.3		
7	2/4	Particle Equilibrium in 3D	3.4	HW3	HW2
8	2/6	Force Systems	4.1-4.5		
9	2/11	Moments About an Axis	4.1-4.5		
10	2/13	Couples and Equivalent Systems	4.6 – 4.8	HW4	HW3
11	2/18	Equilibrium of Rigid Bodies	5.1 – 5.2		
12	2/20	Equilibrium of Rigid Bodies in 2D	5.3 – 5.4	HW5	HW4
13	2/25	Exam I Review			
	2/27	**Exam I**			
14	3/3	Truss Analysis: Method of Joints	6.1 – 6.3		
15	3/5	Truss Analysis: Method of Sections	6.4	HW6, Project	HW5
	3/10	No Class (Spring Break)			
	3/12	No Class (Spring Break)			
16	3/17	Frames and Machines	6.6		
17	3/19	Internal Forces	7.1	HW7	HW6, Project
18	3/24	Shear and Moment Diagrams	7.2 – 7.4		
19	3/26	Shear and Moment Diagrams	7.2 – 7.4	HW8	HW7
20	3/31	Friction Basics	8.1 – 8.2		
21	4/2	Multiple Surfaces and Belts	8.3 – 8.5	HW9	HW8
22	4/7	Centroids	9.1		
23	4/9	Composite Bodies	9.2	HW10	HW9
24	4/14	Exam II Review			
	4/16	**Exam II**			
25	4/21	Moments of Inertia and Parallel Axis Theorem	10.1 – 10.2		HW10
26	4/23	Final Exam Review			
	4/28	**Final Exam**			

Desired 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)

12. Reliably complete work and submit it in a timely fashion