

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

**ENGR 2301 Engineering Mechanics: Statics**

**Course Syllabus (Summer I 2020)**

**This version supersedes all earlier versions.**

Time & venue	Class times: MTWRF on Canvas. From June 1 to July 3. This is an asynchronous online class, which means it is not a real-time class.
Instructor	Dr. Zafer Miqdadi Email: <a href="mailto:zmiqdadi@uttyler.edu">zmiqdadi@uttyler.edu</a> Office hours: MTWRF on Canvas
Teaching assistant	N/A
Course website	See UT Tyler's Canvas Website
Course objective	<p>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.</p> <p>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.</p>
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.

	<p><b>This is your primary text. Any additional material posted on Canvas can not be considered a replacement.</b></p>
Grading	<p>Contributions towards final grade (out of 100%)</p> <ul style="list-style-type: none"> <li>10% Attendance and participation</li> <li>15% Exam 1</li> <li>15% Exam 2</li> <li>30% Final examination</li> <li>30% Homework</li> </ul> <p>In grading the homework, assignments, tests, exams, etc., no credit will be given to methods <b>not</b> covered in this class, although these methods, tables, formula may appear in the textbook. Errors or outdated material in the textbook should not be the reason for claiming full credit on work done.</p> <p>Letter grades will be assigned based on the final course grade:</p> <ul style="list-style-type: none"> <li>A 90 and above</li> <li>B 80 to 89.99</li> <li>C 70 to 79.99</li> <li>D 60 to 69.99</li> <li>F below 60</li> </ul> <p>No letter grade will be released until it is official on PeopleSoft.</p> <p>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 <b>Final Examination</b> will automatically receive an <b>F</b> grade.</p>
Attendance and participation	Attendance and participation will be taken based on student activity on Canvas.
Exams	Exams will be given on Canvas. The dates and timeframes of the Exams will be announced at least 1 week advance in class.
Final Exam	<b>The Final Exam is on 7/3.</b> All material covered in the course will be tested.
General Exam Rules & Cheat Sheet	<p>All exams are closed book. You are only allowed to use your writing instruments, erasers, and NCEES approved calculators.</p> <p>Topics to be tested will be announced in class and on Canvas one week prior to the exam.</p> <p>To discourage students from focusing narrowly in only a few questions, <b>no</b> 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.</p>

Calculators	In line with the Civil Engineering Department's policy, only calculators permitted by NCEES for use in the <u>current semester's FE exam</u> 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 <a href="http://www.ncees.org">www.ncees.org</a> 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	N/A
Design Project	N/A
Homework	<p>Numerous homework problems will be assigned in this class. The homework problems will be assigned at the completion of a topic and will be <b>due on Canvas on the day/time stated in assignment tab. Only selected homework problems will be graded. Homework solution must be submitted on Canvas as one document. You can use engineering paper (scan it or take pictures), Word or Excel.</b></p> <p>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. <b>Draw a box around your final answer.</b> Not having any of the above will lead to points being deducted.</p> <p>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 textbook or think of the solution yourself or discuss with your classmates.</p>
Late homework/ assignment policy	<p>Absolutely <b>NO</b> late homework will be accepted. If it is not posted on Canvas assignment tab on the due date, I will not grade it and you will receive a zero for the assignment. No exceptions.</p> <p>Homework solutions are usually posted on Canvas after grading your homework.</p>
Re-schedule of examination	<p>There is no make-up or rescheduling of the Final Examination.</p> <p>Make-up for the Exams will only be arranged if you inform the instructor <b>prior</b> to or on the day <b>before</b> the exam, with a strong valid reason.</p>

	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Collaboration/ cheating	<p>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.</p> <p>Students must submit their own, <b>independent</b> solutions (i.e. you may not just copy someone else's homework).</p> <p><b>Do not submit work under your name that you did not do yourself.</b> You may not submit work for this class that you did for another class. <b>If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UT Tyler catalog policy.</b></p>
Academic Dishonesty	<p>Representation of other’s work as your own will not be tolerated. <b>Cheating on examinations, quizzes, and homework and the false representation of work will be interpreted as academic dishonesty.</b> Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of Policies and Procedures for Student</p>

	Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies will provide no protection from the consequences.
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.	N/A.
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 <a href="https://hood.accessiblelearning.com/UTTyler">https://hood.accessiblelearning.com/UTTyler</a> and fill out the <u>New Student</u> application. The <b>Student Accessibility and Resources</b> (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 <a href="http://www.uttyler.edu/disabilityservices">http://www.uttyler.edu/disabilityservices</a> , the SAR office located in the University Center, # 3150 or call 903.566.7079.

Grade Replacement/Forgiveness. If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

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 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard. Petitions for exemptions must be

submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079. Additional information may also be obtained at the following UT Tyler Web address: <http://www.uttyler.edu/disabilityservices>

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.

### **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, waterpipes (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](http://www.uttyler.edu/tobacco-free).

## Tentative Schedule

Lesson	Date	Topic	Text	HW Assigned	HW Due
1	6/1	Course Introduction	1.1 – 1.6	HW1	
2	6/2	Force Vectors	2.1-2.4		
3	6/3	3D Vectors	2.5 – 2.8		
4	6/4	Dot Product and Cross Product	2.9, 4.2	HW2	HW1
5	6/5	Particle Equilibrium	3.1 – 3.3		
6	6/8	Particle Equilibrium in 3D	3.4	HW3	HW2
7	6/9	Force Systems and Moments About an Axis	4.1 – 4.5		
8	6/10	Couples and Equivalent Systems	4.6 – 4.8	HW4	HW3
9	6/11	Equilibrium of Rigid Bodies	5.1 – 5.2		
10	6/12	Equilibrium of Rigid Bodies in 2D	5.3 – 5.4	HW5	HW4
<b>11</b>	<b>6/15</b>	<b>Exam I</b>			
12	6/16	Truss Analysis: Method of Joints	6.1 – 6.3		
13	6/17	Truss Analysis: Method of Sections	6.4	HW6	HW5
14	6/18	Frames and Machines	6.6		
15	6/19	Internal Forces	7.1	HW7	HW6
16	6/22	Shear and Moment Diagrams	7.2 – 7.4		
17	6/23	Shear and Moment Diagrams	7.2 – 7.4	HW8	HW7
18	6/24	Friction Basics	8.1 – 8.2		
19	6/25	Multiple Surfaces and Belts	8.3 – 8.5	HW9	HW8
20	6/26	Centroids	9.1		
<b>21</b>	<b>6/29</b>	<b>Exam II</b>			
22	6/30	Composite Bodies	9.2	HW10	HW9
23	7/1	Moments of Inertia	10.1 – 10.2		
24	<b>7/2</b>	Other topics			HW10
<b>25</b>	<b>7/3</b>	<b>Final Exam</b>			



## **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