STATICS: MECH 1321

Class Reference Number:	25325
Prerequisite:	MATH 1411 Calculus
Textbook:	**Engineering Mechanics: Statics 15th ed.** by R.C. Hibbeler
Class Meeting:	MW 3:00- 4:20 pm
Class Room:	UGLC 342
Instructor:	Mohiuddin Ahmad, Ph.D. Aerospace and Mechanical Engineering Office: A315 E-mail: mahmad@utep.edu
Office Hours:	TBD
Teaching Assistant:	TBD

Course Objectives

At the end of the course, students will learn the principles that govern the behavior of rigid-body mechanical engineering systems in static equilibrium. Specifically, students will be able to do the following:

1. Identify an engineering problem appropriate for engineering mechanics analysis.
2. Draw a free-body diagram and identify all forces and moments acting on an object at rest.
3. Represent force and moment systems with equivalent systems.
4. Perform an analysis to identify all forces and moments acting internally or externally on an object.
5. Determine the geometric properties of one, two and three-dimensional objects

Topics covered

1. General Principles (Chapter 1)
2. Force Vectors (Chapter 2)
3. Equilibrium of a Particle (Chapter 3)
4. Force System Resultants (Chapter 4)
5. Equilibrium of a Rigid Body (Chapter 5)
6. Structural Analysis (Chapter 6)
7. Internal Forces (Chapter 7)
8. Friction (Chapter 8)
9. Center of Gravity and Centroid (Chapter 9)
10. Moment of Inertia (Chapter 10)

Grades

Your grade for this course will be assessed based on your performance in the following:

Exam 1 (30 %)
Homework (20 %)
Quizzes (10 %)
Class Performance (5%)
Exam 2 (35 %)

Several quizzes will be given throughout the semester. The lowest quiz score will be eliminated. The content of a quiz could be from the materials covered in previous sessions or to be covered that day. There will be no make-up quizzes.

Your final grade will be calculated based on the points you have accumulated as follows:

A	$\geq$88
B	$\geq$78 but <88
C	$\geq$68 but <78
D	$\geq$58 but <68
F	<58

Important note:
Every week, you will have a practice class or workshop as in your weekly schedule. You must attend all the workshops. Even though you get a good score, if you don't attend the workshop regularly, you may have a lower grade. Below is the requirements for grades in addition to the score mentioned above.
A = 10 or more workshops
B = 8 or more workshops
C and D = 6 or more workshops

Allowed Calculators

The following will be the only calculators allowed in exams:

- Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
- Hewlett Packard: The HP 33s and HP 35s models but no others.
- Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

These are the same calculators that are currently being allowed in the Fundamental of Engineering (FE) and Professional Engineering (PE) exams (http://www.ncees.org/exams/calculators/). It is your responsibility to get acquainted with the features of the calculator you decide to use. I recommend that you use this calculator for all your work (including other courses) since this will help you learn how to use all the features of your calculator.

Homework

Late homework will be penalized by 10% deduction per day after the deadline. You have 2 trials to submit the correct answer.

Dropping Class Deadline: April 4th, 2025

Academic Honesty

During exams and quizzes, you are not allowed to use any form of wifi-enabled electronic device, including cell phones or other electronic communication devices or methods (wristwatches, earbuds, etc.). No wristwatch or another electronic device may be worn.

No electronic version of the book, loose paper print-outs of the book, or extra sheets of paper of any kind is allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if you have a cellphone or other electronic device capable of communication on your person; or if any proctor sees or hears any electronic device during the exam or if you share your work with someone else, you will be reported to the proper authorities, and you may receive a zero on the exam and an F in the class. Other actions, including suspension, may also be pursued.

If anyone leaves the exam room during an exam, they must be accompanied by a proctor. This includes restroom breaks. University-approved recording devices may also be located at various locations in the room and may be out of sight of the students. These recordings will be managed according to the UTEP-approved regulations for such media.

If you are suspected of scholastic dishonesty, you may not be directly confronted about your conduct by the instructor or proctor. You will, however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR), and your exam will not be admissible. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes.

There will be no makeup exams administered. If you have a university approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given.

If you miss more than one exam, the instructor may choose to drop you from the class administratively. This may adversely impact a visa and financial aid.

Any food or drink brought into the examination room is subject to careful inspection by a proctor.

Departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam.

Scholastic dishonesty on homework, lab assignments, and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

Class Attendance Policy

Attendance is mandatory. Anyone with 5 or more absences will be dropped from the class. A drop for not attending will count toward the State Allowed Six-Drop Limit. If you are failing the class at the time of the drop, you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid, and other programs.

As per UTEP rules, you may be asked to show a UTEP ID at any time during class. Anyone who is present and not registered in the class will be subject to disciplinary action unless the instructor gives prior approval.

Excused Absence for Exams

The UTEP catalog allows Exam Absence to be excused ONLY for University-Recognized Activities and very specific other situations.

Harassment Policy

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment would be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made, or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment, but repeated questions about a grade or an administrative decision are.
- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.
- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.
- Similar behavior towards department staff and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students and should be treated with due respect.

ACES & Tutoring Center

Students are reminded of the tutoring services available in the ACES and the library. These services are provided to you by the University. Check the schedules and make use of the services.

Study Aids

Instructor's Office Hour

During the specified office hours, you can drop by the office for any questions regarding the subjects discussed in the class without making an appointment. Of course, you are always welcomed to visit me at any other times, but I may not be available for discussion because of other commitments. Leave me a note, call for an appointment, or send me an e-mail will be the most effective way to catch me for your questions. Remember, do not pile up questions and expect me to answer all your questions the day before an exam. I prefer MS team for additional questions.

Teaching Assistant

There will be a teaching assistant (TA) assigned to each session. The TA will assist the instructor in grading homework, proctoring exams, and answering questions. In addition to the instructor's office hour, there will be TA's office hours to answer your questions. The TA's schedule will be announced in the second week of the class.

References

Students are encouraged to study materials related to the subjects discussed in the class. There are many books that can help students to improve their understanding of the subjects and their problem-solving skills. Some of the books that you can find in the library are:

Wolstenholme and Cantab, *Elementary Vectors*. QA433.W64
Davis and Snider, *Introduction to Vector Analysis*. QA433.D38
Jensen and Chenoweth, *Statics and Strength of Materials*. TA351.J4
Spiegel and Limbrunner, *Applied Statics and Strength of Materials*. TA351.S64
Beer and Johnston, *Vector Mechanics for Engineers: Statics and Dynamics*. TA350.B3552
Meriam and Kraige, *Engineering Mechanics: Statics*. Fourth Edition. TA350.M458, 1997
D. Rylance, *Mechanics of Materials*. TA405.R794, 1996
R. Craig, *Mechanics of Materials*. TA405.C89, 1996
W. Riley, L.D. Sturges, and D.H. Morris, *Mechanics of Materials*. TA450.R55, 1999

Schedule

Week	Date	Chapter	Sections	Assigned Problems	Due Date
1	1/20-1/26	2	2.1 - 2.4 2.1 Scalars and Vectors 2.2 Vector Operations	Jan 20-Holiday	
2	1/27-2/2	2	2.3 Vector Addition of Forces 2.4 Addition of a System of Coplanar Forces 2.5 Cartesian Vectors		

			2.6 Addition and Subtraction of Cartesian Vectors		
3	2/3-2/9	2	2.7 Position Vectors 2.8 Force Vector Directed Along a Line 2.9 Dot Product		
4	2/10-2/16	3	3.1 – 3.4 (**Equilibrium of a Particle)** 3.1 Condition for the Equilibrium of a Particle 3.2 The Free-Body Diagram 3.3 Coplanar Force Systems 3.4 Three-Dimensional Force Systems		
5	2/17-2/23	4	4.1 – 4.3 4.1 Moment of a Force–Scalar Formulation 4.2 Cross Product 4.3 Moment of a Force–Vector Formulation		
6	2/24-3/2	4	4.4 Principle of Moments 4.6 Moment of a Couple 4.7 Simplification of a Force and Couple System		
7	3/3-3/9	4	4.8-4.9 4.8 Further Simplification of a Force and Couple System 4.9 Reduction of a Simple Distributed Loading		

8	3/10-3/16	5		Spring Break	
9	3/17-3/23	5	Exam 1: Chapter 2-4 5 **Equilibrium of a Rigid Body** 5.1 – 5.3 5.1 Conditions for Rigid-Body Equilibrium 5.2 Free-Body Diagrams	Exam 1 3/19 Chapter 2-4	
10	3/24-3/30	5	5.3 Equations of Equilibrium 5.4 Two- and Three- Force Members 5.5 Free-Body Diagrams		
11	3/31-4/6	5	Equilibrium in Three Dimensions **5.5 – 5.7** 5.6 Equations of Equilibrium 5.7 Constraints and Statical Determinacy 6.1 – 6.4 **Trusses** 6.1 Simple Trusses		
12	4/7-4/13	6	6.2 The Method of Joints 6.3 Zero Force Members 6.4 The Method of Sections 6.6 Frames and Machines		
13	4/14-4/20	6 & 7	7 **Internal Forces** 7.1 – 7.2 7.1 Internal Forces Developed in Structural Members		
14	4/21-4/27	9	9.1 – 9.2 **Centroid** 9.1 Center of Gravity, Center of Mass and the Centroid of a Body 9.2 Composite Bodies		
15	4/28-5/4	10	10 **Moments of Inertia** 10.1 – 10.4 10.1 Definition of Moments of Inertia for Areas 10.2 Parallel Axis Theorem for an Area 10.3 Radius of Gyration of an Area		

			10.4 Moments of Inertia for Composite Areas 10.8 Mass Moment of Inertia		
16	5/5-5/8			**Exam 2: 5,6,7,9,10**	