Statics Syllabus – Spring 2024

Course Information

Course Number/Section	MECH 2310.002
Term	Spring 2024
Lecture time	**TR 11:30 a.m. – 12:45 p.m.**
Lecture classroom	**ECSW 3.210**

Professor/Teaching Assistant (TA) Contact Information

Professor	**P.L. Stephan Thamban**
Office Phone	972-883-4687
Office	ECSW 2.150E
Email Address	stephan@utdallas.edu (course in subject line, complete sentences, basic email etiquette is expected)
Office Hours	**Wednesdays (1:00 p.m. – 2:00 p.m.)**
TA	**Bharath Ravichander**
TA's Email Address	BharathBhushan.ravichander@utdallas.edu
TA Office	ECSW 3.150
TA *Office Hours*	By appointment (contact via email to schedule it)

Prerequisites: MECH 1208 and (PHYS 2325 and PHYS 2125). Prerequisite or Corequisite: MATH 2415 or MATH 2419 or equivalent.

Course Description

Course material includes vector representations of forces and moments, free body diagrams, equilibrium of particles, center of mass, centroids, distributed load systems, equivalent force systems, equilibrium of rigid bodies, trusses, frames and machines, internal forces in structural members, shear forces and bending moments in beams, friction, area and mass moments of inertia, the principle of virtual work.

Student Learning Objectives/Outcomes

Introduce various types of force systems at rest using the classical Newtonian mechanics that governs physical systems at rest. Specifically, the course will

1. Apply knowledge in mathematics, science and engineering to understand and formulate relations describing static equilibrium.
2. Solve statics problems for systems modeled as particles and rigid bodies.
3. Work in teams to apply knowledge of statics to solve real-world problems.
4. Apply static equilibrium principles to model mechanisms and various friction effects.
5. Apply computational tools to solve static equilibrium problems.
6. Calculate centroids and mass properties of engineering shapes and bodies.

Required Textbooks and Materials

Required textbook: You can choose from the following options for the copy of the textbook

- Engineering Mechanics: Statics & Dynamics (hard cover) plus Modified MasteringEngineering with Pearson etext Access Card package, 15th edition, R.C. Hibbeler (or)
- Engineering Mechanics: Statics & Dynamics (loose leaf) plus Modified MasteringEngineering with Pearson eText, 15th edition, R.C. Hibbeler, Prentice Hall, ISBN 9780137519170 (or)
- **Engineering Mechanics: Statics & Dynamics, 15th edition, R.C. Hibbeler, etext with Modified MasteringEngineering access**

Required online registration

Along with the copy of the textbook, you are required to be registered on Pearson's MyLab & Mastering to complete HW assignments. You will have to purchase the access code or use the one that is available with your copy of the textbook (you can use the access code that you purchased earlier to get registered). To register on that access the Pearson's MyLab & Mastering link available in the eLearning course homepage in the tools section on the left side of the webpage.

Textbooks and some other bookstore materials can be ordered online or purchased at the UT Dallas Bookstore.

Tentative schedule

Week #	Course Material	Chapter	Discussion topics
1,2	Introductory remarks, vector mathematics	1,2	Systems of units, general principles in analysis, Vector operations, position vectors
2	Equilibrium of a particle	3	FBDs, analysis in cartesian, n-t-b, cylindrical/polar systems
3	Force system resultants	4	Moment of a Force, Moment of a couple, Simpliications of a system, Distributed loading
4	Equilibrium of a rigid body	5	Conditions for equilibrium, reaction forces, FBDs, Two force and multi-force members
5	Structural analysis	6	Truss analysis
6	**First midterm test – Feb 20th or 22nd (in class)**		
6-8	Structural analysis	6	Frames, Machines.
9	Internal forces	7	Normal/shear and bending moments, relationships between internal forces, Shear-Bending moment diagrams.
10	Friction	8	Dry friction, Wedges.
11	**Second midterm test – Apr 2nd or 4th (in class)**		
11	Friction - continuation	8	Friction in screws, belt friction.
12	Centroid	9	Centroids of continuous objects and composite objects
13,14	Moments of inertia	10	Area/mass MOI of continuous objects and composite objects
15	Virtual work	11	Introductory remarks (time permitting)
Last day of class 5/3/24			
Final exam – TBD (May 6th – 10th)			

Grading Policy

Two midterm tests	: 40%
Final Exam	: 25%
Homework	: 20%
Project	: 10%
Rewritten class notes	: 5%

Notes:

- There will be two midterm tests during the semester and a final exam.
- Specific details regarding tests/exam will be given as we get closer to the test/exam date.
- During the course of the semester, details regarding the project will be given.
- Instructor reserves the right to flex the grade range slightly to accommodate "borderline" students who have demonstrated efforts towards success in the course to the next higher grade.
- **After the final exam, no remedial** measures can be given to improve the grade. Students are expected to monitor their progress to assess where they stand in the course based on the grading policy above. Instructor may include curve points.

Grade components

- Rewritten notes:
  - Rewritten lecture notes will have to be turned-in once a week on Tuesdays (by 11:59 p.m.).
  - Rewritten notes (RWNs) will be a pdf document uploaded to eLearning. You can write your RWNs on paper and scan it using your phone camera or other devices to pdf format and upload it. Before you upload, ensure that the document is **readable**.
  - RWNs will be graded on a "Completed" (1)/ "Not Completed" (0) basis.
- Homework:
  - Homework (assigned almost every week) is due by midnight (11:59 p.m.) on due date.
  - If there are solution entry difficulties for specific HW problems, contact the instructor about those specific situations.
  - Solutions for homework problems will be available with the instructor/TA.
- Other assignments files:
  - Matlab® related assignments have to be turned-in on eLearning.
  - Files/documents related to the project will be collected through eLearning.

Course Policies

Make-up exams

Make-up test/exam will be given only for special situations (upon verifying documentation).

Extra Credit

Instructor may include special assignment(s) to complement any of the above grade components.

Late Work Policy

- If due to an unavoidable circumstance (health, family & other emergencies) a student has to turn-in work after it is due, upon verifying supporting documents that attest such an emergency, the instructor may waive the penalty for late work. It will be dealt with on a case-by-case basis by the instructor.
- Late work will be considered only for special situations.
- Missed tests due to health reasons or family/other emergencies have to be supported by acceptable documentation to be considered for make-up arrangements. It will be dealt with on a case-by-case basis by the instructor.

Class Participation

Students will have to attend lecture sessions. Tests/exam may include material exclusively (not in the textbook) covered during lectures. During a lecture, the instructor will assume that students had been present for previous lectures as it relates to continuity of discussions. Students are expected to be present for lectures on time (**11:30 a.m.**).

Suggestion for success

Do not skip attending lectures. Course ramps up on a weekly basis. So, develop a habit of keeping up on a weekly basis - there is no room for getting "left behind" and "catching up". If you have difficulties, identify them early and bring it to the attention of the instructor immediately so remedial measures can be suggested. Lot of practice is required to have a higher success percentage in problem-solving given the time frame you will operate in tests/exams. So, it is highly recommended that students work on problems beside the ones assigned for homework.

Academic Honesty

Refrain from getting solutions from sources not permitted by the instructor. When in doubt ask if it is allowed. https://www.utdallas.edu/conduct/integrity/

You can discuss with your peers on HW problems, but do not copy their solutions. Academic dishonesty will be handled per the guidance provided in this link https://www.utdallas.edu/conduct/manage-dishonesty/

Class Materials

The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class,or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Attendance

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students.

Please see http://go.utdallas.edu/academic-support-resources.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.