MECH 3123: SOLID MECHANICS LABORATORY

Class Reference Number (CRN): 25836
Class Time: Wednesday- 4.30-7.20 PM

Classroom Lab room
LART 222, BUSN 302 E 107 (Lockheed Martin Lab)

Textbook/Resources
- No textbook is required.
- Reading materials will be posted.
- Laboratory manual and handouts should be used as references.

Instructor
Dr. Methaq Abed and German Valenzuela, PhD Student
Department of Mechanical Engineering
E-mail address: gvalenzuela10@miners.utep.edu
Office hours: Through MS Teams, by appointment
Recommended times: Monday and Wednesday: 10:40-12:40 AM

Course Overview
This course will provide you with hands-on experience dealing with practical issues in engineering experiments. In this lab, you will learn how to take the basic measurements of well-known phenomenon and analyze data, considering various sources of error and uncertainty in the setup.
Topics covered will include reviewing of some of solid mechanic’s theory, introduction to fracture mechanics, uncertainty analysis, statistical analysis, and error analysis.
There are six experimental test setups designed to test specific phenomenon. The following experiments listed below will be performed throughout the semester:

1. Tensile testing of different components using UTM
2. Energy absorbed at fracture for different materials
3. Bending analysis of an I beam
4. Torsional analysis of a hollow shaft
5. Bending analysis of a hollow shaft
6. Study of Bifilar suspension
7. Study of mass spring systems
8. Project

Note: You must follow the UTEP EH&S lab safety policy during lab sessions. Example: No shorts, flip/flops during lab sessions. Foods are not allowed inside the laboratory.
Course Objectives
The general purpose of this course is to strengthen the student’s understanding of engineering measurements and results reporting. Specifically, at the end of the course the student will be able to:

1. Understand how the fundamental equations can be applied to engineering measurements;
2. Become familiar with sources of experimental uncertainty and apply these concepts mathematically;
3. Be able to methodically record data and present it in a technical report format.

Attendance
You must come to your scheduled lab group sessions. No additional time will be allowed for late attendance. You will not be allowed to join other group for makeup. Online sessions are mandatory to attend. The Quiz/Exam will be based on (but not limited to) the materials covered in the class notes, examples, and handouts.

Lab Reports
You will get one week to prepare your lab report. One combined report per group is required. You must submit the lab report at the beginning of the next lab session/class. NO extensions will be given in the submission of reports. Include all necessary figures and tables in the report with suitable captions. A template will be provided for the laboratory reports, please follow these instructions. Your lab report will be graded based on the requirements listed in the template.

Quizzes/Short Midterm Exam
- The short Midterm Exams will be about 1-hour long. (Total two midterms)
- Quizzes/Exams will be given based on reading materials and class notes.
- The instructor MUST be notified of an absence PRIOR to the absence. A message may be left with the instructor by email. Written proof must be provided along with contact information for verification to request a makeup exam.

Grading
The final grade for these courses will be based on the followings

<table>
<thead>
<tr>
<th>Grades</th>
<th>Grade Scale</th>
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<tbody>
<tr>
<td>Laboratory Reports</td>
<td>A 90-100%</td>
</tr>
<tr>
<td>Mid Term Quiz</td>
<td>B 80-89%</td>
</tr>
<tr>
<td>Peer Review</td>
<td>C 70-79%</td>
</tr>
<tr>
<td>Project</td>
<td>D 60-69%</td>
</tr>
<tr>
<td>Class Performance</td>
<td>F &lt;60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
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</tbody>
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The instructor reserves the right to revise the grade plan.
**Academic dishonesty**

During exams and quizzes, you are not allowed to use any form of Wi-Fi enabled electronic device, including cell phones or other electronic communication devices or methods (wrist watches, earbuds, etc.). No wristwatch or other 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 are 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 perused.

If you have a disability that requires the use of an electronic device during exams you must have a letter of accommodation from the Center for Accommodations and Support Services (CASS). This accommodation must be coordinated in advance with the instructor.

During exams, you will not be allowed to leave the examination room until you complete the exam. This includes restroom breaks. Students with disabilities must have a letter of accommodation and coordinate this in advance with the instructor.

Instructors and/or proctors may record and/or use their personal cell phones to document activity during the exam. 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.

If you arrive more than 15 minutes late to an exam, you will not be allowed to enter the examination room.

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 administratively drop you from the class. This may adversely impact a visa and financial aid.

No food or drinks will be allowed in the examination room.

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 3 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.

**Harassment Policy**

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will 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.

**Reasonable Accommodation Policy**

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.
Course Calendar
May be updated throughout the semester. Always see the current version of the syllabus on Blackboard.

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
<th>Tasks of the Week</th>
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</table>
| 01/25/2023 W(4.30-7.3 PM) & 01/27/2023 F(8.00-11 AM) | Lecture 1  
• Mass Spring System  
• Project | 1  
• Complete Experiment and compose report.  
• Report Due: Mass Spring System |
| 02/03/2023 F |  | 2  
• Work on Project  
• Project report 1 submission. |
| 02/10/2023 F |  | 3  
• Complete Experiment and compose report  
• Report Due: Tensile Test |
| 02/15/2023 W(4.30-7.3 PM) & 02/17/2023 F(8.00-11 AM) | Lecture 2  
• Tensile Test  
• Energy absorbed at Fracture | 4  
• Complete Experiment and report.  
• Report Due: Energy absorbed at Fracture |
| 02/24/2023 F | Midterm Quiz | 5  
• Complete Experiment and compose report  
• Report Due: Energy absorbed at Fracture |
| 03/03/2023 F |  | 6  
• Complete Experiment and compose report.  
• Report Due: I Beam Bending |
| 03/10/2023 W/F | Lecture 3  
• I beam Bending  
• Hollow shaft torsion  
• Project Discussion | 7  
• Complete Experiment and compose report.  
• Report Due: Hollow Shaft Torsion |
| 03/22/2023 F |  | 8  
• Complete Experiment and compose report.  
• Report Due: Bifilar Suspension |
| 03/24/2023 F |  | 10  
• Complete Experiment and compose report.  
• Report Due: Hollow Shaft Torsion |
| 04/05/2023-04/07/2023—NO LABS | Lecture 4  
• Hollow Shaft Bending  
• Bifilar Suspension  
• Quiz Discussion | 11  
• Complete Experiment and compose report.  
• Report Due: Bifilar Suspension |
| 04/14/2023 F-Lecture |  | 11  
• Complete Experiment and compose report.  
• Report Due: Bifilar Suspension |
| 04/21/2023 F |  | 12  
• Complete Experiment and compose report.  
• Report Due: Bifilar Suspension |
| 04/28/2023 F | Midterm Quiz | 13  
• Complete Experiment and compose report.  
• Report Due: Bifilar Suspension |
| 05/05/2023 F |  | 14  
Final Project Report Submission |
Department of Mechanical Engineering Safety Statement

The Department of Mechanical Engineering at the University of Texas at El Paso is committed to a model of excellence in education that includes providing a safe and healthy environment for its students, staff, faculty and the general public.

Our goal is to maximize education and research training that can only occur if you, the individual, minimize hazards and risks. This can be done by:

- Providing adequate control of the health and safety risks arising from any and all activities;
- Consulting with employees on matters affecting their health and safety;
- Providing and maintaining safe laboratories and equipment;
- Ensuring safe handling and use of substances;
- Ensuring all employees are competent to do their task and have adequate training; and
- Maintaining clean, safe and healthy working conditions.

The principal investigator or individual in charge of each laboratory is ultimately responsible for safety in that respective lab. This includes training and ultimate release of the laboratory. Within the Department, we hold every employee (staff, faculty, and student) responsible for implementing our safety practices and our departmental safety policy. We hold every employee (staff, faculty, and student) responsible for providing leadership within our department to establish effective environmental safety and occupational health standards.