

Mech 3113-01: Thermo-Fluids Lab

CRN: 24929

Class time: Friday 11:00 AM – 13:50 PM

Textbook/Resources

- No textbook is required.
- Reading materials will be posted.
- Laboratory manuals and handouts should be used as references.

Instructor: Dominic Austen
Graduate Student (PhD in mechanical engineering)
Department of Aerospace and Mechanical Engineering
E-mail Address: dhausten@miners.utep.edu
Office hours: Tuesday 10am – 11 am ACES C001

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 run, measure, or calculate and analyze the data that comes from the pump experiment, solar heater experiment, wind tunnel experiment, wind blower experiment, Rankine cycle experiment, etc.

Topics covered will include reviewing of works the basic aspects of thermos-fluids, the basic principle of how the experimental system works, evaluation and characterization of thermo-fluids properties, and their physical significance. Some practical problems and their consequences originated in thermodynamic systems at different operating conditions will also be discussed.

There are ten experimental test setups designed to test specific phenomena. The following experiments listed below will be performed throughout the semester:

1. Viscosity Experiment
2. Centrifugal Pump Lab
3. Wind Turbine
4. Wind Tunnel
5. Heat Exchanger Conduction
6. Heat Exchanger Convection
7. Heat Exchanger Counterflow/Crossflow
8. Flat Panel Solar Collector
9. Parabolic Solar Panel

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 thermo-fluids. Specifically, at the end of the course the student will be able to:

1. Become familiar with different thermos-fluids based systems
2. Generate ideas and apply mathematical concepts to thermo-fluids systems
3. Methodically record data and present it in a technical report format

Attendance

Students will make an appointment with the lab over the week to conduct the experiments. Confirm attendance with the lab assistants.

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 groups for makeup. Class attendance is strongly encouraged as 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 and Exam

- The exam will be about 1 hour long.
- The quizzes will be conducted throughout the semester with prior notice.
- 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 to 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 following:

| Grades | |
|--------------------|------|
| Laboratory Reports | 80% |
| Class performance | 10% |
| Quizzes | 10% |
| Total | 100% |

| Grade Scale | |
|-------------|-----------|
| A | 90 – 100% |
| B | 80 – 89% |
| C | 70 – 79% |
| D | 60 – 69% |
| F | < 60% |

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 (wristwatches, earbuds, etc.). No wristwatch or other electronic devices may be worn. No electronic version of the book, loose paper printouts 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 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 for 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 accommodation, please contact The Center for Accommodations and Support Services (CASS) on 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.

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 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 substance
- Ensuring all employees are competent to do their task and have adequate training
- 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.

Thermo-fluids Laboratory
Fall 2023 Class Schedule

- Report Submission on Each **Friday** by midnight.

| Week | Activity | Task |
|------------|------------------------------|--|
| 1/19/2024 | Introduction, Course Outline | |
| 1/26/2024 | Viscosity | |
| 2/02/2024 | Centrifugal Pump Lab | Report Due: Viscosity |
| 2/09/2023 | Wind Turbine | Report Due: Centrifugal Pump Lab |
| 2/16/2024 | Wind Tunnel | Report Due: Wind Turbine |
| 2/23/2024 | Heat Exchanger Conduction | Report Due: Wind Tunnel |
| 03/01/2024 | Quiz | Report Due: Heat Exchanger Conduction |
| 3/08/2024 | No Class | |
| 3/15/2024 | Spring Break | |
| 3/22/2024 | Heat Exchanger Convection | |
| 3/29/2024 | Heat Exchanger Counterflow | Report Due: Heat Exchanger Convection |
| 4/05/2024 | Flat Panel Solar Collector | Report Due: Heat Exchanger Counterflow |
| 4/12/2024 | Parabolic Solar Collector | Report Due: Flat Panel Solar Collector |
| 4/19/2024 | Quiz | Report Due: Parabolic Solar Collector |
| 4/26/2024 | Reserve date | |
| 5/03/2024 | Reserve date | |

***May be updated throughout the semester. Always see the current version of the syllabus on Blackboard**