

The University of Texas Rio Grande Valley
College of Engineering and Computer Science
Department of Mechanical Engineering

MECE 3160 Heat Transfer Laboratory (Summer 2016)

Instructor: Lawrence Cano

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Office: ENGR 3.216

Office Hours: TW 1:00 PM – 2:00 PM

Room: ENGR 2.466

Time: MECE 3160 MTW

Section 01 9:40 AM – 12:40 PM

Website: faculty.utrgv.edu/samantha.ramirez

Section 02 2:40 PM – 5:40 PM

Course Prerequisite:

Credit for MECE 3315 & MECE 3360 and/or enrollment in MECE 3360

Prerequisite Knowledge:

- Derivatives, integrals, and their applications
- Use of computer spreadsheets
- Basic measurements and instrumentations
- Modes of heat transfer

Textbook:

Lab handouts

Course Objectives:

1. Learn the principle and applications of conduction heat transfer (thermal conductivity measurement).
2. Understand and measure the thermal conductivity of liquids and gases.
3. Learn the principle and applications of radiation heat transfer (thermal emissivity measurement).
4. Learn the principle and applications of free and forced convection heat transfer.
5. Get familiar with different kinds of heat exchangers.
6. Understand the refrigeration cycle; its components, operation, and temperature, pressure, and flow rate measurements.
7. Introduce the concept of the thermal boundary layer thickness.
8. Introduce the basic theory of boiling and condensation heat transfer.

Topics:

- Conduction Heat Transfer in Solids
- Conduction Heat Transfer in Liquids and Gases
- Free and Forced Convection Heat Transfer
- Radiation Heat Transfer
- Refrigeration Cycle
- Thermal Boundary Layer
- Boiling and Condensation Heat Transfer

<u>Grading Policy:</u>	Lab Reports	50%
	Final Project	25%
	Lab Notebook	15%
	Quizzes	10%

Equipment:

Safety glasses, permanently bound notebook, appropriate laboratory attire.

Attendance and Participation:

Attendance and participation in laboratory sessions are **mandatory**. No credit will be given for laboratory reports from missed laboratory sessions without an excused absence. If you must miss a laboratory session, see your professor about making up the lab.

Late Lab Reports:

Unless otherwise informed, lab reports are due one week after completing the laboratory and are to be handed in within the first 10 minutes of the laboratory meeting. Make every effort to turn in the lab reports on time. Once you get behind, it can be very difficult to catch up. Lab reports submitted late will have the score reduced by 20 points per day. Lab reports submitted more than 5 days late will not be accepted for credit and you will receive a 0 for that lab.

Lab Groups:

Lab groups will be determined the first day of lab. Each group will choose a leader. The group leader will be the line of communication between his/her group and the instructor. The group leader will be responsible to ensure that each member of the group has the needed data to complete the lab report. Each member of the group, including the group leader, will have to submit their own lab report.

Scholastic Integrity:

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

Drop Policy:

Students can withdraw from a course through the *Office of the Registrar* on or prior to:

- July 19th, 2016, Wednesday: Last day to drop a class before it appears on the transcript and counts toward the "6-drop" limit. Last day to receive a 100% refund for dropped classes (other policies apply when a student is withdrawing from all classes).

- August 10th, 2015, Wednesday: Drop/Withdrawal Deadline; last day for students to drop the course and receive a “DR” grade. After this date, students will be assigned a letter grade for the course that will count on the GPA.

Course Drops:

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

Students with Disabilities:

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time.

Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu.

Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

Sexual Harassment, Discrimination, and Violence:

In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

Course Evaluation:

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Online evaluations will be available Aug. 10 – Aug. 19, 2016. Students who complete their evaluations will have priority access to their grades.

Course Outcomes and Assessment:

The student should be able to

1. Understand the basis for common material behaviors.
2. Perform and utilize general techniques of measurement.
3. Perform basic statistical analysis.
4. Write technical memos or technical laboratory reports.
5. Read, interpret, and apply industrial or voluntary standards.
6. Function in a single or multi-disciplinary team.
7. Adhere to basic laboratory safety guidelines.
8. Record information in a technical laboratory notebook.

	1	2	3	4	5	6	7	8	S1	S2	S3	E1	E2	E3	E4	E5
1		X												X		
2		X													X	
3											X					
4					X										X	
5							X									X
6				X	X											
7						X										
8					X										X	

Mechanical Engineering Program Educational Objectives:

The educational objectives of the Mechanical Engineering Program at the University of Texas Rio Grande Valley are to produce graduates who have:

1. the knowledge and technical skills required to be and to remain productive in the field of mechanical engineering.
2. an understanding of the importance of professionalism, ethics, safety, and socioeconomic concerns in resolving technical problems.
3. the capability of functioning in diverse environments.

Educational Outcomes:

It will be demonstrated that the student:

1. is able to use knowledge of mathematics, basic sciences and engineering to analyze (identify, formulate, and solve) problems in mechanical engineering.
2. is able to design and conduct experiments and interpret results.
3. is able to design mechanical devices, systems or processes that meet given specifications.
4. is able to function in multi-disciplinary teams.
5. is able to communicate ideas effectively in graphical, oral, and in written media.
6. understands the professional responsibility of an engineer and how engineering solution impacts safety, economics, ethics, politics, and societal, cultural, and contemporary issues.
7. understands the need for lifelong learning to keep abreast of current practice.

8. is able to use state of the art computational hardware and software for analysis, design, and documentation (techniques, skills, and modern engineering tools necessary for engineering practice).

Fundamentals in Science and Mathematics:

It will be demonstrated that the student has the:

1. knowledge of chemistry and calculus-based physics with depth in at least one.
2. ability to apply advanced mathematics to problems involving thermal and mechanical systems.
3. ability to apply statistics and linear algebra to problems involving thermal and mechanical systems.

Fundamentals in Engineering:

It will be demonstrated that the student has the ability to:

1. create and annotate two-dimensional drawings, and generate three-dimensional computer based on solid models of technical components.
2. design and analyze components and systems for mechanical and energy performance.
3. specify and evaluate materials and manufacturing steps for mechanical components.
4. conceive and conduct experiments to measure the performance of materials, components and systems, and to communicate the results.
5. acquire new skills and specialized knowledge from published sources.

ACKNOWLEDGEMENT OF RECEIPT OF SYLLABUS

By signing below, I hereby affirm that I have received a copy of the syllabus for **MECE 3160 Heat Transfer Laboratory** and have been informed by the **Instructor** that it is my responsibility to **carefully** read and understand this document and abide by all its content. I also agree to prepare and submit to the **Instructor**, at the end of the semester, a folder that contains **all** my homework assignments, quizzes, exams, projects, reports and/or literature review (if applicable).

I also agree, that I will not submit any assignment(s) or labs(s) to the instructor via email, placement in faculty drop box, or any other method deemed “unconventional” by the instructor, without the instructors prior consent. Therefore, I understand that any assignment I submit out of class time and by “unconventional methods” without consent, may not be accepted and/or graded by the instructor.

Student ID Number

Printed Name

Signature

Date