

THE UNIVERSITY OF TEXAS RIO GRANDE VALLEY
College of Engineering and Computer Science
Department of Mechanical Engineering

MECE 3360-01 Heat Transfer – 3 Credits – Spring 2022

Room: EENGR 1.236

Time: TR 8:00 – 9:15 a.m.

Instructor: Dr. Constantine Tarawneh **Office:** EENGR 1.294D **Phone:** (956) 665-2607

Office Hours: MTWR 1:10 - 2:25 pm **Strict**, or by Appointment

Email: constantine.tarawneh@utrgv.edu **Website:** <http://faculty.utrgv.edu/constantine.tarawneh/>

Textbook:

F. P. Incropera and D. P. DeWitt, ***Fundamentals of Heat and Mass Transfer***, Seventh Edition, John Wiley & Sons, 2011. [ISBN-13: 978-0470501979]

Prerequisites:

A grade of “C” or better in MECE 3315 Fluid Mechanics.

Course Modality: Traditional Face-to-Face (TR)

This course will follow a traditional face-to-face modality. Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences (i.e., > 8 absences). UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; have been provided such an accommodation by Student Accessibility Services (SAS); for observance of religious holy days; or for military service. Accommodations related to COVID-19 should also go through SAS. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

All lectures and instructional materials have already been pre-recorded and made available on Blackboard so students can access the course material at any time and place. A weekly face-to-face recitation session will be scheduled to afford students the opportunity to ask questions about their homework assignments and seek input and assistance on the problems assigned. All students will be expected to show up to campus to take their three scheduled exams in the Engineering Auditorium EENGR 1.300 while following all health and safety guidelines. Absolutely no online exams will be permitted but special accommodations can be made with the instructor for extreme emergencies or for specific health concerns.

Course Description:

This course covers the following topics: theory of heat transfer by steady and transient conduction, free and forced convection heat transfer in external and internal flows, heat exchangers, and radiation heat transfer.

Course Outcomes & Assessment:

At the conclusion of this course, students will be able to:

1. Analyze problems dealing with conduction, convection and radiation heat transfer (H, Q, T).
2. Formulate and solve problems which deal with two or more of the three modes of heat transfer which includes continuity and the first law of thermodynamics (H, Q, T).
3. Design and optimize cooling systems for electronic components (H, Q, T).
4. Size heat exchangers to meet given design specifications (H, Q, T).
5. Understand the concepts of black and non-black body radiation (H, Q, T).

Key: H - Homework, Q - Quiz, T - Test

Grading Policy:

There will be weekly homework assignments (15%), quizzes (5%), and two in-class midterm exams (26.5% each), and a final exam (27%). Exams will be **closed book and notes**, but you will be provided with a booklet that contains all pertinent information. **Only** simple (nonprogrammable) scientific calculators will be allowed in the exams. [A ≥ 88%, 88% > B ≥ 78%, 78% > C ≥ 68%, 68% > D ≥ 58%, F < 58%].

Homework:

A homework will be assigned every week. The homework problems will be posted on Blackboard. To ensure that students do their own work, one of the problems, from each homework, will be chosen for a ten-minute quiz that will be administered the day the homework is due. The student's performance on the quiz will be used in grading the homework assignment. Any discrepancy between the student's performance on the quiz and the homework assignment may result in loss of credit in the total homework grade. After the homework is graded and returned, solutions will be made available on Blackboard.

In solving the homework assignment, the following four steps should be followed very carefully:

1. Briefly summarize the problem statement.
2. Provide a schematic diagram of the problem.
3. Solve the problem showing your work in detail by stating your assumptions and providing the equations you used and the numerical values you obtained.
4. Write a sentence or two discussing your findings and conclusions.

Failure to follow the abovementioned four steps will result in points deducted from your homework assignment.

Homework and Exam Policy:

1. **Absolutely no late** assignments will be accepted.
2. **Absolutely no** cell phones, laptops, iPads, iPods, or any other smart technology devices are allowed in exams.
3. Make-ups for in-class exams for **documented emergencies** will be scheduled during the last week of class.

<u>CHAPTER</u>	<u>TOPIC</u>	<u>SECTIONS COVERED</u>
1	<i>Introduction</i>	All
2	<i>Introduction to Conduction</i>	All
3	<i>One-Dimensional, Steady-State Conduction</i>	All
5	<i>Transient Conduction</i>	5.1 – 5.3
Midterm Exam 1 (Thursday 3/3/2022 from 6 – 8 p.m.)		
6	<i>Introduction to Convection</i>	All except 6.7
7	<i>External Flow</i>	All except 7.7 & 7.8
8	<i>Internal Flow</i>	8.1 – 8.6 & 8.10
Midterm Exam 2 (Thursday 4/21/2022 from 6 – 8 p.m.)		
9	<i>Free Convection</i>	9.1 – 9.6 & 9.11
11	<i>Heat Exchangers</i>	All except 11.6
12	<i>Radiation: Processes and Properties</i>	All
13	<i>Radiation Exchange between Surfaces</i>	13.1 – 13.3
Final Exam (Tuesday 5/10/2022 from 8:00 - 9:45 a.m.)		

Attendance Policy:

Attendance will be taken every time the class meets. Any student arriving to class **5 minutes** after the class has started will not be allowed in class. Students will be allowed a **maximum** of *three* absences for the whole semester. **One point** will be deducted from the total (100%) for each absence exceeding the maximum allowable unless documentation justifying that absence is provided. Students **will not** be permitted to leave the classroom during lectures and exams except for **extreme emergencies**.

Due to COVID-19, the attendance policy will be flexible to accommodate special circumstances. The use of recordings will enable you to have access to class lectures, group discussions, etc. in the event you have to miss a face-to-face class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA), UTRGV's acceptable-use policy, and UTRGV HOP Policy STU 02-100 Student Conduct and Discipline. A recording of class sessions will be kept and stored by UTRGV, in accordance with FERPA and UTRGV policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action under UTRGV HOP Policy STU 02-100 Student Conduct and Discipline.

COVID-19 Resources:

Please visit the [UTRGV COVID-19 protocols web page](#) for the most up-to-date COVID-19 campus information and resources. The [COVID-19 Frequently Asked Questions \(FAQs\) web page](#) offers additional guidance to specific questions. To submit a question for the FAQ, please email WelcomeBack@utrgv.edu.

UTRGV Vaccine Portal:

UTRGV Students are eligible to receive the COVID-19 Vaccine. Students may access and complete their vaccine profile via the [UTRGV Vaccine Portal](#). For additional information on the COVID-19 Vaccine, please visit the [UTRGV Vaccine web page](#).

Students with Disabilities:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive reasonable academic accommodations should contact **Student Accessibility Services (SAS)** for additional information. In order for accommodation requests to be considered for approval, the student must apply using the *mySAS* portal located at www.utrgv.edu/mySAS and is responsible for providing sufficient documentation of the disability to SAS. Students are required to participate in an interactive discussion, or an intake appointment, with SAS staff. Accommodations may be requested at any time but are not retroactive, meaning they are valid once approved by SAS. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations:

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to apply to **Student Accessibility Services** using the following link: [Pregnancy Accommodations Request Form https://www.utrgv.edu/pregnancy](https://www.utrgv.edu/pregnancy)

Student Accessibility Services:

Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

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

Academic Integrity:

Members of the UTRGV community uphold the [Vaquero Honor Code](#)'s shared values of honesty, integrity and mutual respect in our interactions and relationships. In this regard, academic integrity is fundamental in our actions, as any act of dishonesty conflicts as much with academic achievement as with the values of honesty and integrity. Violations of academic integrity include, but are not limited to: cheating, plagiarism (including self-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 (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). **All violations of Academic Integrity will be reported to Student Rights and Responsibilities through [Vaqueros Report It](#).**

Sexual Misconduct and Mandatory Reporting:

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (OIED@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and 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 that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

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.

Mandatory Course Evaluation Period:

Students are encouraged 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. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

Spring Module 1 (7 weeks) February 23 – March 1, 2022
Spring Regular Term 2022 April 15 – May 4, 2022
Spring Module 2 (7 weeks) April 20 – 26, 2022

Student Services:

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

Center Name	Brownsville Campus	Edinburg Campus
Advising Center AcademicAdvising@utrgv.edu	BMAIN 1.400 (956) 665-7120	ESWKH 101 (956) 665-7120
Career Center CareerCenter@utrgv.edu	BCRTZ 129 (956) 882-5627	ESSBL 2.101 (956) 665-2243
Counseling Center Counseling@utrgv.edu	BSTUN 2.10 (956) 882-3897	EUCTR 109 (956) 665-2574
Counseling and Related Services List		

Food Pantry FoodPantry@utrgv.edu	BCAVL 101 & 102 (956) 882-7126	EUCTR 114 (956) 665-3663
Learning Center LearningCenter@utrgv.edu	BMSLC 2.118 (956) 882-8208	ELCTR 100 (956) 665-2585
Writing Center WC@utrgv.edu	BUBLB 3.206 (956) 882-7065	ESTAC 3.119 (956) 665-2538

Blackboard Support:

If you need assistance with course technology at any time, please contact the [Center for Online Learning and Teaching Technology](#) (COLTT).

Campus:	Brownsville	Edinburg
Location:	Casa Bella (BCASA) 613	Education Complex (EEDUC) 2.202
Phone:	956-882-6792	956-665-5327

Toll Free: 1-866-654-4555

Office Hours: Monday - Friday, 7:30 a.m. - 6:00 p.m.

Support Tickets Submit a Support Case via our [Ask COLTT Portal](#)

24/7 Blackboard Support:

Need Blackboard assistance after hours? You can call our main office numbers, 956-882-6792 or 956-665-5327, to speak with a support representative.

Important Dates:

The UTRGV academic calendar can be found at <https://my.utrgv.edu/home> at the bottom of the screen, *prior to login*. Some important dates for Spring 2022 include:

January 18	<i>First day of classes</i>
January 23	<i>Last day to add a class or register for Spring 2022 classes</i>
March 14-19	<i>Spring Break – NO classes</i>
April 11	<i>Last day to drop a class or withdraw</i>
April 15-16	<i>Easter Holiday – NO classes</i>
May 5	<i>Study Day – NO classes</i>
May 6-12	<i>Final Exams</i>
May 16	<i>Grades Due at 3 p.m.</i>

Dean of Students Resources:

The Dean of Students office assists students when they experience a challenge with an administrative process, unexpected situation such as an illness, accident, or family situation, and aids in resolving complaints. Additionally, the office facilitates student academic related requests for religious accommodations, support students formerly in foster care, helps to advocate on behalf of students and inform them about their rights and responsibilities, and serves as a resource and support for faculty and campus departments.

[Vaqueros Report It](#) allows students, staff, and faculty a way to report concern about the well-being of a student, seek assistance in resolving a complaint, or report allegations of behaviors contrary to community standards or campus policies.

The Dean of Students can be reached by emailing dos@utrgv.edu, by logging into [Virtual Office hours](#) in which a representative is available Monday-Friday 9:00-11:00 a.m. and 1:00-4:00 p.m., or by visiting one of the following office locations: Cavalry (BCAVL) 204 or University Center (EUCTR 323). Phone: 956-665-2260.

ACKNOWLEDGMENT OF RECEIPT OF SYLLABUS

By signing below, I hereby affirm that I have received a copy of the syllabus for **MECE 3360 Heat Transfer** 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).

Student ID Number

Printed Name

Signature

Date