

Heat Transfer

EML 4140 Section 298S

Class Periods: MWF 7th period, 1:55 pm – 2:45 pm

Location: MCCB 1108

Academic Term: Fall 2023

Instructor:

Dr. J. N. Chung, Professor
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Office Hours: MW 8th Period (3-4 pm)

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

- [Jimmy Almacddissi, jimmyalmacddissi@ufl.edu](mailto:jimmyalmacddissi@ufl.edu), PERC 121, 2-3 pm Tu, Th

Course Description

Credits: 3; Steady state and transient analysis of conduction and radiation heat transfer in stationary media. Heat transfer in fluid systems, including forced and free convection.

Course Pre-Requisites / Co-Requisites

EML3353C and EML 3100.

Course Objectives

This course provides an intermediate level coverage of thermal transport processes via conduction, convection, and radiation heat transfer. It stresses fundamental engineering science principles applied to thermal energy transport analysis. Students will learn to apply the conservation of energy to control volumes and express the conservation of energy through mathematical formulations, including both steady state and transient analyses, with emphasis on the fundamental physics and underlying mathematics associated with heat transfer. Upon completion of this course, students are expected to understand basic heat transfer solution techniques, coupled with a strong foundation and appreciation for the physics of heat transfer.

Materials and Supply Fees

None

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Medium

5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	Not Covered
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Not Covered
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	high

Required Textbooks and Software

Fundamentals of Heat and Mass Transfer, T.L. Bergman, A.S. Lavine, F.P. Incropera, and D.P. DeWitt, 7th Edition, John Wiley & Sons, Inc., 2012, ISBN: 978-0-470-91785-5

(if course notes derived from various published sources are used, provide information above for each source)

(if course notes are developed by the instructor, so state)

Recommended Materials

- None

Course Schedule

Date	Topic	Date	Topic
Aug 23	1.1,1.2	Oct 20	7.6,7.9
Aug 25	1.3,1.4	Oct 23	8.1,8.2
Aug 28	1.5,1.6,1.7	Oct 25	8.2,8.3
Aug 30	2.1,2.2,2.3	Oct 27	8.3
Sept 1	2.3,2.4,2.5	Oct 30	8.3,8.4,8.5
Sept 4	(Labor Day)	Nov 1	8.5,8.6
Sept 6	2.5,3.1	Nov 3	9.1,9.2
Sept 8	3.1	Nov 6	9.4,9.5
Sept 11	3.3,3.4	Nov 8	Exam 2
Sept 13	3.5	Nov 10	Holiday
Sept 15	3.6	Nov 13	9.6,9.8
Sept 18	4.2,4.3	Nov 15	9.8,9.9
Sept 20	5.1,5.2	Nov 17	9.9,12.1
Sept 22	5.3	Nov 20	12.1,12.2
Sept 25	5.4,5.5	Nov 22	Thanksgiving Holiday
Sept 27	5.6	Nov 24	Thanksgiving Holiday
Sept. 29	6.1,6.2	Nov 27	12.3,12.4
Oct 2	6.2,6.3	Nov 29	12.4,12.5
Oct 4	Exam 1	Dec 1	12.7,12.8
Oct 6	(Home Coming)	Dec 4	13.1, 13.2
Oct 9	6.5	Dec 6	13.2
Oct 11	6.6	Dec 14	Final Exam (10:00 am -12:00 pm, Thursday)
Oct 13	6.7,6.8		
Oct 16	7.1,7.2,7.3		
Oct 18	7.4,7.5		

EXAM POLICY : There will be three exams. The 3rd exam will be given during Finals Week in the time slot specified by the University. Exams 1 and 2 will be through **Honorlock** and answers will be submitted on Canvas by the specified due time on the day of the exam. There will be no classes on the days of the first two exams. The final exam will be in-person on campus. None of the exams are comprehensive. Each exam will cover a portion of the course material as specified in this syllabus.

Attendance Policy and Class Expectations

Attendance is mandatory, it is extremely important that students attend the class regularly. Irregular attendance always results in poor or mediocre performance. Excused absences will be given for documented medical reasons, i.e., **UF business-related** travel or **confirmed** job interview travel. Documentation must be in the form of a doctor's note, or letter from the sponsor of the travel. **Re-grading Policy:** Any re-grade requests must be submitted in writing within one week after return of the graded paper. The written request must explain in detail what you want the grader to do and where you believe a mistake in grading was made. These requests will be accepted by Dr. Chung only. The request must have a date on the top of the page, your name, your telephone number(s), and e-mail address. **Policy on Homework Assignments:** Homework problem sets will be assigned on a weekly basis and each set will be due a week later **in class**. Only two of the assigned homework problems for each set will be graded in detail but solutions will be posted for all assigned problems. You may not turn homework assignments in early. Late homework is not accepted without a acceptable reason. Homework handed in after solutions are posted will not be accepted. **Miscellaneous Policies:** Students will be held responsible for knowledge of all scheduling and policy announcements made in class. You may contact Dr. Chung or send him an e-mail 24 hours a day, 7 days a week. Please make sure you leave a phone number if you want to talk to him. If you send an e-mail please also list a phone number where you could be reached. Sending an e-mail along with the voice message can also help alert him to your request. **Please note that e-mails are used for special requests or non-HW related issues (do not use e-mail to ask for home work solution guidance. Use offices hours of the instructor and TAs).**

Make-up Exam Policy: In general, there will be no make-up exams. Unless there is a **documentable medical or family emergency**, you must contact the instructor prior to the exam or no credit will be given for a missed exam. It is the student's responsibility to make sure he/she is available to take the exam. Two exams during the semester will be given according to the scheduled listed above. The final exam will be given according to the University final exam schedule.

Policy on General Behavior, Cell Phones, and Laptops: Proper behavior in class is always important and leads to a relaxed and productive educational environment. Thus, eating, drinking, texting, reading of newspapers, working on homework for this or other courses, or other activities that are not part of the class are not allowed. Students who do not comply with these requirements or who behave disorderly or disrespectfully WILL be asked to leave the classroom. Leaving your cell phone on, leaving early or arriving late can be VERY distracting, you should avoid it. All electronic devices (laptops, cell-phones, etc.) should be turned off or in silent mode. Use of smartphones, laptops, tablets or similar personal computers is not allowed unless explicitly requested by the individual student the first day of class and for note taking purposes only.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (10)	20 each	15%
Exam 1	100	25%
Exam 2	100	30%
Final Exam	100	30%

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWCoe Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.