

EML6157-25RT(25711) - Radiation Heat Trans

 Edit

Instructor: Subrata Roy, Rm. NEB 435, Email: roy@ufl.edu (<mailto:roy@ufl.edu>) (preferred)
Professor of Mechanical Engineering

Time and Place: T 8-9 periods R 9 period in MCCB 011108

Office hours: By appointment (please send an email to roy@ufl.edu (<mailto:roy@ufl.edu>) with subject EML6157)

Reference Books:

1. R. Siegel, J.R. Howell, and M.P. Menguc, *Thermal Radiation Heat Transfer*, 5th edition, ISBN-13: 978-1439805336.
2. M.F. Modest, *Radiative Heat Transfer*, 3rd edition, ISBN-13: 978-0123869449.
3. M.Q. Brewster, *Thermal Radiative Transfer and Properties*, Wiley, 1992.

Assignments: Paper reviews and homework.

Goals: Understanding principles of radiation heat transfer and methods for solving relevant engineering problems.

Topics	Approximate Class Hours
1. Basic concepts, blackbody radiation	4
2. Radiative properties of opaque surfaces	5
3. Radiation detectors and radiation thermometry	3
4. Radiative properties of solid thin films and layered structures	4
5. Configuration/View factor, radiation exchange between surfaces	6
6. Numerical methods in radiation heat transfer	5
7. Radiation transfer in absorbing, emitting, and scattering medium	9
8. Combined radiation with conduction and convection	2
9. Heat radiation at micro/nanoscales	2

Lecture Notes (<https://ufl.instructure.com/courses/549068/files/99438250?wrap=1>)

Project

30% of the grade for this course is based on the project report (20%) and presentation (10%). Around the 7th week of this course, students should submit a page of their project proposal. This is an advanced level graduate course. So, students can propose topics of their preference which will be discussed individually and finalized. Once a project topic is decided, students will have about 6-8 weeks (including holidays) to finish the project and submit the final report after the in-class presentation.

Links

<https://www.youtube.com/watch?v=sweVNjEQj0s>  (<https://www.youtube.com/watch?v=sweVNjEQj0s>)

(<https://www.youtube.com/watch?v=sweVNjEQj0s>)

(Cloaking etc)

<https://www.youtube.com/watch?v=f0iZraLdNuM>  (<https://www.youtube.com/watch?v=f0iZraLdNuM>)

(<https://www.youtube.com/watch?v=f0iZraLdNuM>)

(Metamaterial)

Monte Carlo Technique Example (<https://ufl.instructure.com/courses/549068/files/99211631?wrap=1>)

Vector Algebra Notes (<https://ufl.instructure.com/courses/549068/files/99211621?wrap=1>)

Grading Policy

The course grade will be determined by the following weight:

- 40% assignment (due dates: 9/12, 9/26, 10/17, 11/14, 11/21);
- 30% mid-term exam (**10/28**);
- 10% final project presentation (**12/9**);

20% final project report (12/10).

Class Policies:

- 1. Each student is responsible for all of the material presented in class and in the reading assignments.
- 2. All homework/assignments and projects are to be turned in at the beginning of the designated class period. In general, no late assignments will be accepted or makeup exams are given. Exceptions will be made for a valid excuse consistent with University Policy.
- 3. Each student is responsible for performing his or her own homework assignment.
- 4. **NO collaboration is allowed on exams.**
- 5. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
- 6. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting an accommodation. This process must be completed in advance.
- 7. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include: University Counseling Center, 301 Peabody Hall, 392-1575; SHCC Mental Health, Student Health Care Center, 392-1171; Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161. Career Resource Center, Reitz Union, 392-1601, for career development assistance and counseling.
- 8. Software Use – All faculty, staff, and student 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.

Course Summary:

Date	Details	Due
Fri Sep 12, 2025	 Assignment 1 (https://ufl.instructure.com/courses/549068/assignments/6769501)	due by 11:59pm
Fri Sep 26, 2025	 Assignment 2 (https://ufl.instructure.com/courses/549068/assignments/6769502)	due by 11:59pm

Date	Details	Due
Fri Oct 17, 2025	 Assignment 3 (https://ufl.instructure.com/courses/549068/assignments/6769503)	due by 11:59pm
Tue Oct 28, 2025	 Midterm Exam (https://ufl.instructure.com/courses/549068/assignments/6769507)	due by 5pm
Fri Nov 14, 2025	 Assignment 4 (https://ufl.instructure.com/courses/549068/assignments/6769504)	due by 11:59pm
Fri Nov 21, 2025	 Assignment 5 (https://ufl.instructure.com/courses/549068/assignments/6769505)	due by 11:59pm
Wed Dec 10, 2025	 Final Project Requirements (https://ufl.instructure.com/courses/549068/assignments/6769506)	due by 11:59pm
	 Midterm Exam Corrections (https://ufl.instructure.com/courses/549068/assignments/6769508)	