ME 6300 Syllabus

Intermediate Heat Transfer, Section A, 3 Credits

Fall 2026

Instructor Information

Instructor: Prof. Satish Kumar

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General Course Information

Description

Intermediate study of heat transfer, transport coefficients, steady state conduction, transient conduction, radiative heat transfer, and forced and natural convection. Become proficient with the analytical and numerical techniques and tools that will allow you to solve a wide range of heat transfer problems. Understand underlying principles through physical concepts and dimensionless governing parameters and appreciate the interconnected nature of several thermal science disciplines.

Course Learning Outcomes

Develop an ability to understand the heat transfer by conduction, radiation, and convection modes

Develop an understanding of the concept of conservation of energy and its application to problems involving conduction, radiation, and/or convection heat transfer

Learn methods of formulating practical conduction heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique and evaluating the significance of results.

Learn the methods to solve engineering problems involving radiation heat transfer among black surfaces and among diffuse gray surfaces and in closed enclosures

Learn methods to formulate and solve engineering problems involving forced convection heat transfer for internal and external flows

Required Course Materials

Nellis, G.F. and S.A. Klein, Heat Transfer, Cambridge University Press, (2009)

Grading Policy:

Homework:	20%
Computer project:	15%
Midterm-1:	32%
Midterm-2:	32%
Participation (In class or office hrs):	*1%*

Description of Graded Components

Homework: You are expected to read the relevant sections of the textbook before each lecture and review examples in text before doing homework. There will be 6-8 homework assignments, due during class one week after they are assigned. Solutions will be posted on the class web page. Homework problems solutions must follow the format described below to receive full credit, unless specifically stated by the instructor. The solution should be concise, written neatly and follows logical steps that include: (a) assumptions and their justification if needed; (b) step by step analysis; and (c) the final answer with the appropriate units and placed in the box. You are encouraged to discuss the homework solving strategies with your friends and classmates, but what you submit for grading should be the result of your and only your own efforts. Your score is partially based on the soundness of your approach, not just the correct answer.
Many of the homework sets will require knowledge of a computer software package (*e.g.*, MATLAB). Engineering Equation Solver (EES) can be used to complete assignments if suggested.

Computer Project: A computer project is required for the section of the course on numerical methods in heat transfer. It could be done by a team that should have ~ 3-4 students. The selection of the team members is voluntary, and all members of the team will receive the same grade. The short (7-8 page maximum) report will be required for grading, and it must include the following: (1) statement of the problem, (2) governing equations and boundary conditions, (3) solution method, (4) results with plots and discussion, and (5) conclusions.

Examinations: There will be two in-class midterm exams (~1 hr 15 minutes).
Midterm exams will be conducted in-person for section A. Make-up examinations will only be given in extreme situations (e.g., serious illness with a note from a physician).

Class Participation:

Students are strongly encouraged to come to Instructor's office hrs to discuss concepts,

assignments, etc. Office hours could be utilized to discuss your progress, ask questions to clarify heat transfer concepts, exam problems, homework problems, etc. (1 % of grade).

Course Policies

Attendance and/or Participation

All students enrolled in section A will take classes in-person. 90 % attendance is required to pass this course.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Not Applicable

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Collaboration, Group Work, and Use of Generative AI

You are allowed to work in groups on all homework and out-of-class assignments, but any work you turn in must be written in your own hand. In-class tests and exams are to be your own work.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Late homework will be penalized accordingly. Make-up exams are given for illness, approved Institute activities or religious observances.