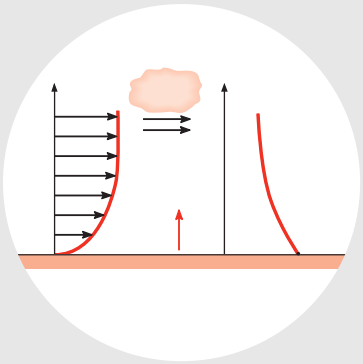

HEAT TRANSFER

ME 603

Instructor Info

Prof. Nathan Laxague

MWF 10:30 am - 11:30 am

Nathan.Laxague@unh.edu

Lecture Info

Prereq: MATH 527 & ME 608

Monday, Wednesday, & Friday

9:10 am - 10:00 am

HORT 210

Recitation Info

Tuesday

11:10 am - 12:30 pm

HS 205

TA Info

Shantanu Soumya

Arranged

Shantanu.Soumya@unh.edu

Dylan Kupetsky

Arranged

Dylan.Kupetsky@unh.edu

Overview

ME 603 is an undergraduate-level course in heat transfer. At the completion of this course, the student should be able to:

- Describe the principles of conductive, convective, and radiative heat transfer
- Apply these principles to basic heat transfer problems
- Analyze heat transfer problems using scientific computing

Material

Required Text

Bergman, Lavine, Incropera and DeWitt *Fundamentals of Heat and Mass Transfer*, 8th Ed., John Wiley and Sons, 2017, ISBN 978-1119444220.

Previous versions of this text are also acceptable. Please note, there is an electronic version of this text for a lower cost.

Other

Any other required reading materials will be provided through Canvas.

Lecture/Recitation Delivery

Students will be expected to attend lecture/recitation and take notes for themselves. If a student has a question, they may raise their hand and I will do my best to answer it succinctly. Extended questions may be addressed during scheduled office hours (see left panel).

Grading Scheme

20%	Homework Assignments (x9, lowest score dropped)
40%	Midterm Exams (20% per exam)
40%	Final Exam

	A	B	C	D	F
+		87-89	77-79	67-69	
	93-100	84-86	74-76	64-66	<60
-	90-92	80-83	70-73	60-63	

Graded Assignments

- Homework will be assigned on Mondays and due (via upload through Canvas) by the end of day the following Monday. Late homework will be marked down 10% per day, up to two days past the due date. Homeworks submitted after 11:59 PM Wednesday will get a zero. *There will be no exceptions to this rule.* The lowest individual homework grade will be dropped.

- Midterm examinations will be adminstered in person in our normal lecture hall.

Homework Assignments

Homework assignments are designed to be preparation for the material that is tested on the exams. Homework will be assigned at the end of class on Mondays and will be due by end of day the following Monday. Late homework will be marked down 10% per day, up to two days past the due date. Homeworks submitted after 11:59 PM Wednesday will get a zero. *There will be no exceptions to this rule*. The lowest individual homework grade will be dropped.

Homeworks will be submitted through Canvas (either written via stylus/tablet or scanned and combined into a single electronic document). In order to facilitate the grading of homework assignments, please adhere to the following requirements:

1. Every page should have your name written at the top of the page. The first sheet of your work shall have this information across the top: Course No./Course Title/H.W. Set No./Name (last, first).

2. Keep problems in the order assigned and separate each problem by a heavy line across the entire sheet. Identify answers by enclosing them in an oval or box.

3. A neat, labeled sketch of the problem setup should be included. The assumptions made for each problem must be clearly stated. Label all plots completely as to title and axes, including dimension and scales.

4. Include the proper complete units associated with the quantities calculated. Use the standard nomenclature of the S.I. or English system unless others are specified.

The Tuesday Recitation after each Homework is due, one of the TAs will present a thorough solution of the material for that assignment. You are encouraged to attend all Recitations to take advantage of this.

Exam Scheduling

Exams will be proctored in the usual lecture hall during marked exam dates. Exams will occur during the evening common exam time: 7:00 PM - 9:00 PM. Individuals with an excused, officially documented reason for absence on exam day will be expected to contact me as soon as possible in order to make alternative arrangements.

It is my goal to create a learning experience that is as accessible as possible. If you anticipate any issues related to the testing requirements of this course or need accommodations, please either discuss them directly with me or in conjunction with the Student Accessibility Services Office within the first week of classes to explore alternative options.

All Spring 2024 final exams will follow normal practice: Monday, May 13th, 2024, 1:00 pm - 3:00 pm.

Academic Integrity

You are required to comply with all University policies regarding Academic Honesty:
https://catalog.unh.edu/srrr/. Suspected violations of academic honesty are handled following Section 9.7, Procedures for Dealing with Academic Misconduct in the Student Rights, Rules, and Responsibilities Handbook, and may result in probation, deferred suspension, suspension, or expulsion. Do honest work; anything else deprives yourself of a learning opportunity that you only have for a short time.

Conduct and Respect for Peers

All participants in ME 603 (including myself, the TAs, and the students) shall treat each other with respect and collegiality. We endeavor to create a welcoming, friendly, and inclusive environment for everyone. To do otherwise marginalizes individuals who are here to learn and grow. Participation is of great importance to an intellectually vibrant class experience. To this end, in order to ensure a climate of learning for all, disruptive or inappropriate behavior (repeated outbursts, disrespect for others, etc.) may result in exclusion (removal) from this class.

Accommodations for Students with Disabilities

The University is committed to providing students with documented disabilities equal access to all university programs and facilities. If you have a disability requiring accommodations, please contact Student Accessibility Services (SAS) at 201 Smith Hall. If you have received an accommodation letter for this class, please contact me immediately so we can discuss the necessary arrangements. SAS may be contacted at https://www.unh.edu/diversity-inclusion/student-accessibility,
(603) 862-2607, sas.office@unh.edu.

Lecture Organization

WEEK (MONDAY DATE)	TOPIC	BOOK CHAPTER(S)
Week 01 (01/22/2024)	Introduction to Heat Transfer	Chap. 01
Week 02 (01/29/2024)	1D Steady-State Conduction	Chap. 03
Week 03 (02/05/2024)	1D Steady-State Conduction	Chap. 03
Week 04 (02/12/2024)	1D Transient Conduction	Chap. 05
Week 05 (02/19/2024)	1D Transient Conduction	Chap. 05
Week 06 (02/26/2024)	2D Steady-State Conduction	Chap. 04
Week 07 (03/04/2024)	Computational Heat Transfer	-
Week 08 (03/11/2024)	3D Transient Conduction	-
Week 09 (03/18/2024)	Spring Recess	-
Week 10 (03/25/2024)	Introduction to Convection	Chap. 06
Week 11 (04/01/2024)	External Flow Forced Convection	Chap. 07
Week 12 (04/08/2024)	External Flow Forced Convection	Chap. 07
Week 13 (04/15/2024)	Internal Flow Forced Convection	Chap. 08
Week 14 (04/22/2024)	Free Convection	Chap. 09
Week 15 (04/29/2024)	Radiation	Chap. 12
Week 16 (05/06/2024)	Course wrap-up	-

Homework Schedule

NAME	TOPIC	ASSIGNED
Homework 01	Differential & Integral Calculus	Week 02
Homework 02	Introduction To Heat Transfer	Week 03
Homework 03	1D Steady-State Conduction	Week 04
Homework 04	1D Transient Conduction	Week 05
Homework 05	1D Transient Conduction	Week 06
Homework 06	Computational Heat Transfer	Week 10
Homework 07	Introduction to Convection	Week 11
Homework 08	External Flow Forced Convection	Week 12
Homework 09	Internal Flow Forced Convection	Week 13

Exam Schedule

NAME	TOPIC	GIVEN
Midterm Exam 01	Conduction	March 14th, 2024 (Week 08)
Midterm Exam 02	Convection	April 25th, 2024 (Week 14)
Final Exam	E V E R Y T H I N G	May 13th, 2024 (Week 17)