

**Instructor:** Xiaohua Li  
**Office:** NTDP F101G  
**Phone:** 940-369-8020  
**Email:** xiaohua.li@unt.edu  
**Office Hours:** Tuesday & Thursday 3:30pm-5:00pm or by appointment.  
**Lecture Time:** Tu & Th 2:00pm-3:20pm room B140

**Required Textbook:** Introduction to Heat Transfer, 6<sup>th</sup> edition  
 Incropera, DeWitt, Berman, & Lavine  
 ISBN-13: 978-0-470-50196-2

**Course Description:**

3 hours. Fundamental concepts and properties of flow in differential and integral form, thermal boundary layers, pipe flow and heat transfer, turbulence, heat and fluid flow correlations for objects of simple shape. Basic concepts of steady and unsteady conduction, elements of radiation, black and gray body radiation, f-factor analysis, combined modes of heat transfer, simple heat exchange devices and systems

**Pre-requisites:** MEEN 3120 Fluid Mechanics.

**Course Learning Outcomes (CLO):**

Upon successful completion of this course, students will able to:

1. Apply conservation of mass, momentum, and energy to heat transfer problems.
2. Understand the concepts of one-dimensional steady-state heat conduction.
3. Understand the concepts of multi-dimensional steady-state heat conduction.
4. Understand the concepts of transient heat conduction.
5. Use thermal Ohm's law (thermal circuits) to solve heat transfer problems.
6. Understand the concepts of internal and external forced convection for both laminar and turbulent flows.
7. Understand the concepts of natural convection.
8. Perform heat exchanger analysis using both the e-NTU and LMTD method.
9. Understand the basic theory behind radiation heat transfer.

CLO	ABET Student Outcomes (SO)										
	SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	SO10	SO11
1	X				X						
2	X				X						
3	X				X						
4	X				X						
5	X				X						
6	X				X						
7	X				X						
8	X				X						
9	X				X						

<b>Grades:</b> Homework	15%	≥ 90%	A
Pop Quizzes (highest 4/5)	15%	80-89.9%	B
Midterm	30%	70-79.9%	C
Project	10%	60-69.9%	D
Final	30%	< 60%	F
Attendance (5/6)	5%		
Total	100%+5%		

### Homework:

- (1) Please turn in your homework on the due day before the lecture starts. **NO late homework will be collected.**
- (2) Definition of “late”: when class is finished and the instructor steps outside the classroom, homework turned in thereafter will be considered as “late” and will not be collected
- (3) Having no textbook is not a valid excuse for not doing your homework. It is the student’s responsibility to acquire textbook for his/her study
- (4) Exceptions (late homework will be collected): medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Proof must be submitted.
- (5) Homework can be turned in earlier than the due day
- (6) You can ask your friend/classmate to turn in homework for you
- (7) You can email the homework to the instructor before the class ends (3:20pm)
- (8) Homework must be stapled, instructor or TA will not responsible for lost loose homework

### Exam and Quiz:

- (1) Quizzes are open book and notes. Exams are closed book closed notes with formula sheets.
- (2) Formula sheets can be maximum 3 pages, A4 or letter sizes, both sides
- (3) Each student is responsible for preparing his/her own formula sheets.
- (4) Formula sheets could include anything BUT: solutions to homework or examples. Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.
- (5) Formula sheets must be turned in with the exam papers. Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.
- (6) **There will be NO make-up quiz.**
- (7) **There will be NO make-up exam.** Exceptions: medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Proof must be submitted.
- (8) **Final exam date: May 9<sup>th</sup> 2013, Thursday, 130pm-330pm, B140**

**Disability Accommodations:** If you need academic accommodations for disability you must have document which verifies the disability and makes you eligible for accommodations, then you can schedule an appointment with the instructor to make appropriate arrangements.

**Academic Dishonesty:**

There is a zero tolerance policy. Cheating of whatsoever will result in an automatic 'F' in this course and the matter will be turned over to the appropriate student disciplinary committee.

**Guidelines for Solving Homework and Exam Problems:**

Please provide the following information and clearly label it when completing homework and exam problems.

1. Schematic diagram of problem.
2. Given/Known: State the given information of the problem.
3. Find: State the variables which need to be found.
4. Solution: (a) If necessary show control volume on schematic diagram of the problem, (b) write out complete equations which govern the problem, (c) solve the governing equations and show all work, and (d) put a box around your final answer and do not forget to include proper units.
5. Sanity check: Make sure your answer makes sense and is reasonable.

**EXAM DATES**

**Midterm: 03/07/2013; Thursday (before spring break); 2:00pm-3:20 pm**

**Group Project: Final reports due on the final exam day;**

**Group presentations will be scheduled in the last lecture week.**

**Final: May 9<sup>th</sup> 2013, Thursday, 130pm-330pm, B140**

# MEEN 3210.001 Heat Transfer

## Schedule Overview (subject to change)

Week	Lecture Dates	Lecture Topic
1	01/15/13 01/17/13	Overview of syllabus Ch.1: introduction to heat transfer
2	01/22/13 01/24/13	Ch 2: introduction to conduction
3	01/29/13 01/31/13	Ch 3: One Dimensional, Steady-State Conduction
4	02/05/13 02/07/13	Ch 3: One Dimensional, Steady-State Conduction
5	02/12/13 02/14/13	Ch 4: Two-dimensional steady state conduction
6	02/19/13 02/21/13	Ch 5: Transient conduction
7	02/26/13 02/28/13	Ch 6: Introduction to convection
8	03/05/13 03/07/13	Ch 6: Introduction to convection <b>Midterm Exam (03/07 Thursday)</b>
9	03/12/13 03/14/13	<b>SPRING BREAK</b>
10	03/19/13 03/21/13	Ch 7: External Flow Ch 7: External Flow
11	03/26/13 03/28/13	Ch 8: Internal Flow
12	04/02/13 04/04/13	Ch 9: Free convection
13	04/09/13 04/11/13	Ch 11: Heat exchangers
14	04/16/13 04/18/13	Ch 11: Heat exchangers Ch 12: Radiation
15	04/23/13 04/25/13	Ch 12: Radiation
16	04/30/13 05/02/13	<b>Project Presentation</b>
17	05/09/13	<b>Final Exam /Final Project Reports</b>

### Document History:

Dr. Sandra Boetcher prepared on 1/08/2011

Dr. Xiaohua Li, modified on 1/10/2012

Dr. Xiaohua Li, modified on 1/13/2013