

# ME 4112- Heat and Mass Transfer

## Fall 2008

M,W,F 1:00 – 1:50 (KPlz 312)

**Professor:** Daniel N. Pope, Ph.D.

E-mail: [dpope@d.umn.edu](mailto:dpope@d.umn.edu)

Office: VKH 113

Phone: 726-6685

Office Hours: Mon, Wed, Fri 10:00-11:00, and Tue 3:00-4:00 (or by appointment)

**Textbook:** Required – Çengel, Yunus A., *Heat and Mass Transfer, A Practical Approach*, 3<sup>rd</sup> Edition, McGraw-Hill (2007).

**Course Web Page:** [http://www.d.umn.edu/~dpope/me4112/me\\_4112.htm](http://www.d.umn.edu/~dpope/me4112/me_4112.htm) Assignments, notes, etc. will be posted on the website. Note that several of the links require you to log in using your UMD email username and password.

**Course Catalog Description:** (3.0 cr; Prereq ME 3211, Math 3298, BSME or BSChE cand or #, =ChE 3112; A-F or Aud, fall, spring, every year) Theory and practice of heat and mass transfer. Fundamentals of diffusion, conduction, convection, and radiation with application to the design of heat and mass transfer equipment and systems.

**Prerequisites:** ME 3211, Math 3298, BSME or BSChE cand or #, =ChE 3112

**Course Components:** The coursework consists of weekly homework, two midterm exams, a final exam and one project.

### Homework:

- Weekly homework assignments will be announced in class and posted on the web page. They will be due in class (usually the following Wednesday).
- Homework solutions will be posted on the course web page.
- The specific format for the homework is given on the course web page.

### Exams:

- The exams will be OPEN BOOK, CLOSED NOTES.
- You may use one page of handwritten (or typed) notes for each midterm.
- The final exam is comprehensive and you may use three pages of handwritten (or typed) notes.

**Grading:** The final percentage grade in the course is based on the following components:

Component	Percentage
Homework	15
Project	15
Two Midterm Exams (20% each)	40
Final Exam	30
Total	100

The corresponding minimum letter grade a student will receive is listed in the table below.

Percentage Grade		Letter Grade
Greater than or equal to	Less than	
0.0	59.5	F
59.5	66.5	D
66.5	69.5	D+
69.5	72.5	C-
72.5	76.5	C
76.5	79.5	C+
79.5	82.5	B-
82.5	86.5	B
86.5	89.5	B+
89.5	92.5	A-
92.5		A

The final letter grade awarded for the class may be higher than the minimum “earned” letter grade but will never be lower. Additional grading policies are listed in the **Attendance/Policies** section below.

**Attendance/Policies:** Attendance at all lectures is mandatory. Exceptions to this attendance policy will be made under extraordinary circumstances (e.g. personal or family emergency) or when the student arranges for an absence in advance.

The following additional policies apply during this course.

- Late assignments (unless prior arrangements are made) will be penalized 25%.
- Assignments that are handed in after solutions have been posted will not be given credit.
- Students are expected to act with honesty and respect (see the following)
  - Student Academic Integrity Policy: <http://www.d.umn.edu/assl/conduct/integrity>
  - Student Conduct Code: <http://www.d.umn.edu/assl/conduct/code>
- Unless specific instructions are given to the contrary, working with others on a given assignment is permissible (and encouraged).
- Copying someone else’s work is NOT permissible. Copied assignments will be given NO CREDIT.

- Using figures or text from a source without citing the source (plagiarism) is NOT permissible. If there is significant plagiarism within an assignment, the assignment will receive NO CREDIT.
- **Disabilities:** Individuals with any disability, either temporary or permanent, which might affect their ability to perform in this course, are encouraged to inform the instructor at the start of the semester. Adaptation of methods, materials, and/or testing may be modified as required to provide for equitable participation.
- **Equal Opportunity:** The University of Minnesota is committed to the practice that all of its students shall have equal educational opportunities. The University expressly forbids discrimination on the basis of race, color, gender, sexual orientation, disability, veteran's status, ethnicity, religion, creed, national origin, or marital status.

## Class Assignment and Reading Schedule

Week	Day	Date	Reading Assignment	Topic	Assignment Due
<b>ONE</b>	Wed	3 Sep		Course Introduction	
	Fri	5 Sep	pp. 1-25	Chapter 1	
<b>TWO</b>	Mon	8 Sep	pp. 25-40	Chapter 1	
	Wed	10 Sep	pp. 61-77	Chapter 2	Hmwk #1
	Fri	12 Sep	pp. 77-97	Chapter 2	
<b>THREE</b>	Mon	15 Sep	pp. 97-101	Chapter 2	
	Wed	17 Sep	pp. 131-149	Chapter 3	Hmwk #2
	Fri	19 Sep	pp. 150-169	Chapter 3	
<b>FOUR</b>	Mon	22 Sep	pp. 169-179	Chapter 3	
	Wed	24 Sep	pp. 285-302	Chapter 5	Hmwk #3
	Fri	26 Sep	pp. 217-229	Chapter 4	
<b>FIVE</b>	Mon	29 Sep	pp. 229-240	Chapter 4	
	Wed	1 Oct	pp. 240-248	Chapter 4	Hmwk #4
	Fri	3 Oct	pp. 248-256	Chapter 4	
<b>SIX</b>	Mon	6 Oct	pp. 311-323	Chapter 5	
	Wed	8 Oct	<b>Review</b>		Hmwk #5
	Fri	10 Oct	<b>Exam 1 - Ch. 1-4</b>		

<b>SEVEN</b>	Mon	13 Oct	pp. 355-366	Chapter 6	
	Wed	15 Oct	pp. 367-376	Chapter 6	
	Fri	17 Oct	pp. 376-384	Chapter 6	

<b>EIGHT</b>	Mon	20 Oct	pp. 395-408	Chapter 7	
	Wed	22 Oct	pp. 408-417	Chapter 7	Hmwk #6
	Fri	24 Oct	pp. 417-423	Chapter 7	

<b>NINE</b>	Mon	27 Oct	pp. 451-463	Chapter 8	
	Wed	29 Oct	pp. 463-473	Chapter 8	Hmwk #7
	Fri	31 Oct	pp. 473-482	Chapter 8	

<b>TEN</b>	Mon	3 Nov	pp. 503-517	Chapter 9	
	Wed	5 Nov	pp. 517-525	Chapter 9	Hmwk #8
	Fri	7 Nov	pp. 525-532	Chapter 9	

<b>ELEVEN</b>	Mon	10 Nov	pp. 561-576	Chapter 10	
	Wed	12 Nov	<b>Review</b>		Hmwk #9
	Fri	14 Nov	<b>Exam 2 - Ch. 6-9</b>		

<b>TWELVE</b>	Mon	17 Nov	pp. 576-591	Chapter 10	
	Wed	19 Nov	pp. 591-597	Chapter 10	
	Fri	21 Nov	pp. 609-622	Project/Chapter 11	

---

<b>THIRTEEN</b>	Mon	24 Nov	pp. 622-631	Chapter 11	
	Wed	26 Nov	pp. 631-645	Chapter 11	Hmwk #10
	Fri	28 Nov	<b>Thanksgiving Break</b>		

<b>FOURTEEN</b>	Mon	1 Dec	pp. 663-679	Chapter 12	
	Wed	3 Dec	pp. 679-692	Chapter 12	
	Fri	5 Dec	pp. 709-724	Chapter 13	

<b>FIFTEEN</b>	Mon	8 Dec	pp. 724-739	Chapter 13	<b>Project Due</b>
	Wed	10 Dec	pp. 739-752	Chapter 13	
	Fri	12 Dec	<b>Review</b>		Hmwk #11

<p><b>Comprehensive Final Exam</b>  <b>Friday, 19 December, 8:00-9:55 am</b></p>
--