

ME 4112- Heat and Mass Transfer

Spring 2011

M,W,F 1:00 – 1:50 (VKH 221)

Professor: Daniel N. Pope, Ph.D.

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Office Hours: Mon, Wed, Fri 11:00-12:00, and Tue 3:00-4:00 (or by appointment)

Textbook: Required – Çengel, Yunus A. and Ghajar, Afshin J., *Heat and Mass Transfer: Fundamentals and Applications*, 4th Edition, McGraw-Hill (2011).

Course Web Page: We will use Moodle for the course website. To access the course site, go to the My Courses tab at the myU portal: <http://myu.umn.edu> or use the following link: <https://moodle.umn.edu/course/view.php?id=15792> (you will have to log in). Grades will be posted using eGradebook.

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/conduct/integrity/>
 - Student Conduct Code: http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.html
- 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:** It is the policy and practice of the University of Minnesota Duluth to create inclusive learning environments for all students, including students with disabilities. If there are aspects of this course that result in barriers to your inclusion or your ability to meet course requirements – such as time limited exams, inaccessible web content, or the use of non-captioned videos – please notify the instructor as soon as possible. You are also encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Please call 218-726-6130 or visit the DR website at www.d.umn.edu/access for more information.
- **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
ONE	Wed	19 Jan		Course Introduction	
	Fri	21 Jan	pp. 1-25	Chapter 1	
TWO	Mon	24 Jan	pp. 25-40	Chapter 1	
	Wed	26 Jan	pp. 63-78	Chapter 2	Hmwk #1
	Fri	28 Jan	pp. 78-98	Chapter 2	
THREE	Mon	31 Jan	pp. 99-106	Chapter 2	
	Wed	2 Feb	pp. 135-153	Chapter 3	Hmwk #2
	Fri	4 Feb	pp. 154-174	Chapter 3	
FOUR	Mon	7 Feb	pp. 174-184	Chapter 3	
	Wed	9 Feb	pp. 225-237	Chapter 4	Hmwk #3
	Fri	11 Feb	pp. 238-248	Chapter 4	
FIVE	Mon	14 Feb	pp. 249-256	Chapter 4	
	Wed	16 Feb	pp. 256-264	Chapter 4	Hmwk #4
	Fri	18 Feb	Review		
SIX	Mon	21 Feb	Exam 1 - Ch. 1-4		
	Wed	23 Feb	pp. 373-386	Chapter 6	
	Fri	25 Feb	pp. 386-395	Chapter 6	

SEVEN	Mon	28 Feb	pp. 395-403	Chapter 6	
	Wed	2 Mar	pp. 417-430	Chapter 7	Hmwk #5
	Fri	4 Mar	pp. 430-438	Chapter 7	

EIGHT	Mon	7 Mar	pp. 439-444	Chapter 7	
	Wed	9 Mar	pp. 465-477	Chapter 8	Hmwk #6
	Fri	11 Mar	pp. 477-488	Chapter 8	

Mon, 14 Mar – Fri, 18 Mar Spring Break

NINE	Mon	21 Mar	pp. 488-497	Chapter 8	
	Wed	23 Mar	pp. 519-533	Chapter 9	Hmwk #7
	Fri	25 Mar	pp. 534-542	Chapter 9	

TEN	Mon	28 Mar	pp. 542-551	Chapter 9	
	Wed	30 Mar	pp. 581-596	Chapter 10	Hmwk #8
	Fri	1 Apr	Review		

ELEVEN	Mon	4 Apr	Exam 2 - Ch. 6-9		
	Wed	6 Apr	pp. 596-610	Chapter 10	
	Fri	8 Apr	pp. 610-612	Chapter 10	

TWELVE	Mon	11 Apr	pp. 629-641	Project/Chapter 11	
	Wed	13 Apr	pp. 641-651	Chapter 11	Hmwk #9
	Fri	15 Apr		NO CLASS	

THIRTEEN	Mon	18 Apr	pp. 651-665	Chapter 11	
	Wed	20 Apr		Project/Chapter 11	Hmwk #10
	Fri	22 Apr	pp. 683-700	Chapter 12	

FOURTEEN	Mon	25 Apr	pp. 700-713	Chapter 12	
	Wed	27 Apr	pp. 731-746	Chapter 13	
	Fri	29 Apr	pp. 746-760	Chapter 13	

FIFTEEN	Mon	2 May	pp. 760-772	Chapter 13	Project Due
	Wed	4 May		Chapters 5 and 14	Hmwk #11
	Fri	6 May	Review		

Comprehensive Final Exam – Ch. 1-4, 6-13 Thursday, 12 May, 2:00-3:50 pm
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