

**Department of Ocean and Mechanical Engineering
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours	
EML 4142 – Heat Transfer	# 3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: EGN 3343 Engineering Thermodynamics EML 3701 Fluid Mechanics EGN 2538 Computer Applications in ME I	
3. Course logistics	
<i>Term:</i> Spring 2015 This is a classroom lecture course Class – MWF 9:00 PM-9:50AM (GS116)	
4. Instructor contact information	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Myeongsub "Mike" Kim Engineering West (EG-36), Room 181 M-W 10:00 AM- 12:00 PM. Anytime by appointment. (561) 297-3442 kimm@fau.edu
5. TA contact information	
<i>TA's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Samar Kaddouri Engineering West (EG-36), Room 256 TBA skaddouri2012@fau.edu
6. Course description	
Modes of heat transfer, one and two-dimensional steady state heat conduction, unsteady heat conduction, numerical methods, computer program projects, empirical relations for forced and free convection, radiation properties, shape factors, radiation heat exchange between gray bodies.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	To acquaint engineering students with analyzing and solving problems that arise in conduction, convection, and radiation modes of heat transfer.
<i>Student learning outcomes & relationship to ABET a-k objectives</i>	The students will be able to <ol style="list-style-type: none"> 1. Identify, analyze, and solve problems on the steady and transient heat conduction problems. (a,e,k) 2. Be familiar with both forced and natural convection, the underlying mechanisms, and empirical correlations, including solving skills. (a,e,k) 3. Explain the principle of radiation heat transfer, view factors, and use them in radiation heat transfer calculations. (a,e,k) 4. Solve heat transfer problems as part of a group-effort class project. (a,e,d,k)

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8. Course evaluation method

Homework – 20%
Midterm Exams – 50% (two exams, 25% each)
Final Examination – 30%

9. Course grading scale

Grading Policy:

Letter Grade	Percentage (%)
A	≥ 95
A ⁻	≥ 90
B ⁺	≥ 85
B	≥ 80
B ⁻	≥ 75
C ⁺	≥ 70
C	≥ 65
C ⁻	≥ 60
D ⁺	≥ 55
D	≥ 50
F	< 50

Note: The minimum grade required to pass the course is C.

10. Policy on makeup tests, late work, and incompletes

Homework

- You are encouraged to work along with your colleagues, but each of you must provide your own individual solution set. **Plagiarism** will result in a **zero** for that set.
- **All** assignment are due on the specified due date **in class**. **No late returns** will be accepted.

Exam

- There will be two midterm exams and a comprehensive final exam. These tests will be given open book and open note.
- **No make-up exam or assignments** will be given unless a medical or other emergency was the reason for missing the exam or the assignments.

11. Special course requirements

12. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions. In addition, no food except drinks will be allowed during the class.

13. Disability policy statement

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In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

14. Honor code policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001 Code of Academic Integrity.pdf

15. Required texts/reading

Textbook: Heat and Mass transfer: Fundamentals and Applications, 5th Edition by Yunus Cengel, Afshin Ghajar, McGraw-Hill, (ISBN: 978-0073398181)

16. Supplementary/recommended readings

Class notes
Textbook reading in advance at each class is strongly recommended

17. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Course Topics

1. Modes of heat transfer
2. Heat Conduction
3. Steady and Transient Conduction
4. Numerical Methods in Heat Conduction
5. Forced Convection
6. Natural/Free Convection
7. Heat Exchangers
8. Radiation Heat Transfer

Tentative Course Schedule

Week	Topics	HWs
1 (1/5, 7, 9)	Introduction, Modes of Heat Transfer (Ch. 1)	
2 (1/12, 14, 16)	Thermal Conductivity, Heat Equation (Ch. 2)	#1
3 (1/19, 21, 23)	Thermal Resistances (Ch. 3), 19: <i>M.L. King Jr. Holiday</i>	
4 (1/26, 28, 30)	Energy Generation, Fins (Ch.3)	#2
5 (2/2, 4, 6)	Lumped Capacitances, Separation of Variables, (Ch. 4)	#3
6 (2/9, 11, 13)	Midterm #1 Finite Difference Methods, Transient Conduction (Ch. 5)	#4
7 (2/16, 18, 20)	Boundary Layers, Flow-Thermal Analogy (Ch. 6)	#5
8 (2/23, 25, 27)	External Forced Convection (Ch. 7)	#6
9 (3/2, 3/4, 3/6)	<i>Spring Break</i>	
10 (3/9, 11, 13)	Internal Forced Convection (Ch. 8)	#7
11 (3/16, 18, 20)	Free Convection (Ch. 9)	#8
12 (3/23, 25, 27)	Midterm #2 Boiling and Condensation (Ch. 10)	#9
13 (3/30, 4/1, 3)	Heat Exchangers (Ch. 11)	#10

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14 (4/6, 8, 10)	Heat Radiation, Emission/Absorption (Ch.12)	#11
15 (4/13, 15, 17)	View Factors, Radiation Exchange (Ch. 13)	
16 (4/20)	Review	
17	Final Exam	

*HW due is every Friday in the following week.