

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

<b>1. Course title/number, number of credit hours</b>	
EOC 4193 – Ocean Thermal Systems	# 3 credit hours
<b>2. Course prerequisites, corequisites, and where the course fits in the program of study</b>	
<b>Prerequisites:</b> EGN 3343 Engineering Thermodynamics, with a grade of C or above <b>Co-requisite:</b> EOC 3123 Ocean Engineering Fluid Mechanics	
<b>3. Course logistics</b>	
<i>Term:</i> Spring 2021 This is a classroom lecture course Class location and time: GS 102, WF 12:30 A.M. - 01:50 A.M.	
<b>4. Instructor contact information</b>	
<i>Instructor's Name</i> <i>Office Address</i> <i>Office Hours</i> <i>Contact Telephone Number</i> <i>Email Address</i>	Dr. Francisco Presuel Engineering West (EG-36), Rm 105 W 2pm-4pm, Available by appointment. (561) 297-3442 <a href="mailto:kimm@fau.edu">kimm@fau.edu</a>
<b>5. TA contact information</b>	
<i>TA's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	N/A
<b>6. Course description</b>	
Basic concepts of heat and mass transfer concepts with application to the ocean and ocean systems. Applications will include power cycles and heat exchangers in ocean systems. The interactive environmental processes involving solar radiation, convective ocean circulation, evaporation and mixtures will be considered.	
<b>7. Course objectives/student learning outcomes/program outcomes</b>	
<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 &amp; relationship to ABET a-k objectives</i>	The students will be able to <ol style="list-style-type: none"> <li>1. Identify, analyze, and solve problems on the steady and transient heat conduction problems. (a,e,k/1,2,6)</li> <li>2. Be familiar with both forced and natural convection, the underlying mechanisms, and empirical correlations, including solving skills. (a,e,k/1,2,6)</li> <li>3. Explain the principle of radiation heat transfer, view factors, and use them in radiation heat transfer calculations. (a,e,k/1,2,6)</li> <li>4. Solve heat transfer problems as part of a group-effort class project. (a,e,d,k/1,2,5,6)</li> </ol>

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**8. Course evaluation method**

Attendance – 10%; Midterm I – 20%; Midterm II – 20%; Design Project – 30%; Final Examination – 20%

Design project (30%) – Required by the Department

- A subject of the project will be given by professor in the middle of the semester
- A group of 3 people will team up for the project (email your group list to [kimm@fau.edu](mailto:kimm@fau.edu) by **Jan. 24**)
- At the end of the semester, each group will present their work in 15 min with 5 min Q&A
- Evaluation: Presentation 60% (Professor 90 + Attendance 10 = 100 points) + Report 40%
- Report/Presentation File Due date: **April 16, 12 P.M.**
- See detailed instructions for the “*directions for design project*” in the Canvas website.

During the lecture, **Bonus Points** will be given to the students who answer the review questions by the professor for the previous lectures.

**9. Course grading scale**

Grading Policy:

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

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

**10. Policy on homework and exams**

**Homework (will not be collected)**

- In general, HWs will be given on Fridays when each chapter is finished
- Solutions will be posted in the following week
- Some questions on midterm and final exam might be based on some HWs

**Exam**

- There will be two midterm exams and a comprehensive (or uncomprehensive) final exam. **Open book only.**
- Engineering calculator allowed, but no equation solver or program allowed.
- **No make-up exam** will be given unless a medical or other emergency was the reason for missing the exam or the assignments.
- **No cell phones, laptops, restroom (if possible)**
- If you need to take your exam at Student Accessibility Services, you should email me your name by **January 17**.

**11. Special course requirements**

- Use Professor’s office hours (please minimize a number of sudden visits)
- Visit the University CANVAS system for important course materials and announcements

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- **Missing classes:** If you will miss the lecture for a medical or other emergency, you should notify me **IN ADVANCE** by an email and must bring a supporting document later.

**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**

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585) — and follow all SAS 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](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

Cell phones are not allowed during exams. If cell phones are detected during any exam periods, this will result in a **grade of "zero" on that exam and a note in the student's academic file.**

**15. Counseling and Psychological Services Center**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

**16. Required texts/ readings**

Class notes

- Textbook reading in advance at each class is strongly recommended.
- Course materials will be uploaded in the Blackboard web site.

**17. Supplementary/recommended readings**

None

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

**Course Topics**

1. Modes of Heat Transfer
2. Steady and Transient Conduction
3. Numerical Methods in Heat Conduction
4. Forced Convection
5. Boiling/Condensation
6. Heat Exchangers
7. Radiation Heat Transfer

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**Tentative Course Schedule (Chapters 1 – 13)**

Week (first day)	Topics Covered	Exam
1 (1/8)	Introduction, Basic Concepts (Ch. 1), Heat Equations (Ch. 2)	
2 (1/15)	Heat Equations (Ch. 2), Steady Heat Conduction (Ch. 3)	
3 (1/22)	Thermal Resistances (Ch. 3)	
4 (1/29)	Transient Heat Conduction (Ch.4)	
5 (2/5)	Numerical Methods (Ch. 5), Fundamentals of Convection (Ch. 6)	<b>Midterm I</b>
6 (2/12)	External Convection (Ch. 7)	
7 (2/19)	External Forced Convection (Ch. 8), Internal Forced Convection (Ch. 8)	
8 (2/26)	Internal Forced Convection (Ch. 8)	
9 (3/5)	<b>Spring Break</b>	
10 (3/12)	Natural Convection (Ch. 9), Boiling and Condensation (Ch. 10)	<b>Midterm II</b>
11 (3/19)	Heat Exchangers (Ch. 11)	
12 (3/26)	Heat Exchangers (Ch. 11), Fundamentals of Radiation (Ch. 12),	
13 (4/2)	Fundamentals of Radiation (Ch. 12), <b>Last day to drop without "F" (4/6)</b>	
14 (4/9)	Radiation Heat Transfer (Ch. 13)	
15 (4/16)	<b>Design Project Presentation</b>	
16 (4/23)	Review, <b>Last Day of Class (4/23), Final Exam (4/27, 10:30am-01:00pm), Grades due (5/7)</b>	<b>Final</b>