

**EML 3100 - Thermodynamics, Spring 2020 (February 4, 2020)**  
**5<sup>th</sup> Period (303 MAEA, Section 121B) and 8<sup>th</sup> Period (1064 WEIM, Section 25E9) MWF**

1. **Catalog Description:** Credits: 3; Application of the first and second laws of thermodynamics to closed and open systems and to cyclic heat engines. This includes the development of procedures for calculating the properties of multiphase and single-phase pure substances.

2. **Pre-requisites and Co-requisites:** *Prereq: CHM 2045, MAC 2313 and PHY 2048.*

3. **Course Objectives:** This course provides an intermediate level coverage of thermodynamics. Students will learn concepts such as system and control volume analyses, evaluation of thermodynamic properties, application of conservation of mass, energy, and the second law of thermodynamics, the use of entropy, the application of availability and irreversibility to engineering problems, and analysis of power and refrigeration cycles.

4. **Contribution of course to meeting the professional component:**

4A. EML 3100 supports several program outcomes enumerated in the Mission Statement of the Department of Mechanical and Aerospace Engineering. Specific ME program outcomes supported by this course include: (1) **Using knowledge of chemistry and calculus based physics with depth in at least one of them (ME Program Outcome M1);** (2) **Using knowledge of advanced mathematics through multivariate calculus and differential equations (ME Program Outcome M2);** (3) **Being able to work professionally in the thermal systems area (ME Program Outcome M4).**

4B. Engineering Science (100%)

5. **Relationship of course to program outcomes:**

This course achieves the following ABET outcomes [note that the outcome number corresponds to the respective ABET outcomes (1) through (7):

**(1) Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [Method of assessment is one or more exam or project problems]**

**(7) Ability to acquire and apply new knowledge as needed, using appropriate learning strategies [Method of assessment is several critiques of research papers in the field of Thermodynamics]**

6. **Instructor:**

Dr. S.A. Sherif, Professor  
Department of Mechanical and Aerospace Engineering  
232 MAE Bldg. B, P.O. Box 116300  
Gainesville, FL 32611-6300  
Tel (352) 392-7821, [sasherif@ufl.edu](mailto:sasherif@ufl.edu)  
<https://faculty.eng.ufl.edu/sa-sherif/>  
Office Hours: MWF 4:15-5:15pm or by appointment

7. **Teaching Assistants (Office Hours):**

1. Mahsa Farzaneh, [mahsafarzaneh@ufl.edu](mailto:mahsafarzaneh@ufl.edu), Wednesday & Thursday 9:30am-11:00pm, 109 NEB
2. Chen Li, [cli4@ufl.edu](mailto:cli4@ufl.edu), 508-831-8995, Wednesday 2:00-5:00pm, NEB 109
3. Dylan McCord, [dylanmccord@ufl.edu](mailto:dylanmccord@ufl.edu), 904-881-2437, Tues. and Thurs., 2:00-3:30pm, 107 MAEC
4. Michael W. Dobbs II, [mwdobbs2@ufl.edu](mailto:mwdobbs2@ufl.edu) (Grader, no office hours allowed)
5. Sourabh Kakade, [sourabh.kakade@ufl.edu](mailto:sourabh.kakade@ufl.edu) (Grader, no office hours allowed)

8. **Meeting Times:** MWF 11:45am-12:35pm and 3:00-3:50pm (5<sup>th</sup> and 8<sup>th</sup> Periods)

9. **Class/Laboratory Schedule/Homepage:** No lab

**Homepage:** **Students have access through E-Learning with Canvas**

10. **Meeting Location:** 5<sup>th</sup> Period (303 MAEA) and 8<sup>th</sup> Period (WEIM 1064)

11. **Material and Supply Fees:** None

12. **Textbooks and Software Required:** Fundamentals of Thermodynamics, 7<sup>th</sup> or 8<sup>th</sup> Editions, C. Borgnakke and R. Sonntag, John Wiley and Sons, Inc. (Make sure you have a hard copy book during the exams. Loose pages are not allowed unless they are in a permanent binding. Three-ring binding is not acceptable but spiral binding is). **Do not get the International Student Edition as it does not have all the needed appendices.**

13. **Recommended Reading:** None

14. **Course Outline:**

**Course Schedule and Assignments:** Exams 1, 2, and 3 are scheduled in the evening (Section numbers below based on 7<sup>th</sup> Edition).

**Location of Midterm Exams:** Little Hall 0121 holds 81 students whereas Little Hall 0109 holds 164 students

**Date: 2/14 Room: LIT 0109, LIT 0101 Time: E2 – E3 (8:20PM to 10:10PM)**  
**Date: 3/20 Room: LIT 0109, LIT 0121 Time: E2 – E3 (8:20PM to 10:10PM)**  
**Date: 4/17 Room: LIT 0109, LIT 0121 Time: E2 – E3 (8:20PM to 10:10PM)**

Date	Topic	Date	Topic
Jan 6	2.1 to 2.5	March 4	Spring Break
Jan 8	2.6 to 2.12	March 6	Spring Break
Jan 10	3.1 to 3.3	March 9	8.7, 8.8
Jan 13	3.4 to 3.6	March 11	8.9, 8.10
Jan 15	3.7 to 3.10	March 13	8.11 to 8.13
Jan 17	4.1 to 4.3	March 16	9.1 to 9.3
Jan 20	<b>Martin Luther King Holiday</b>	March 18	9.4 to 9.6
Jan 22	4.4 to 4.6	<b>March 20</b>	<b>EXAM 2 (Chapters 6, 7, 8)</b>
Jan 24	4.7 to 4.9	March 23	10.1
Jan 27	5.1 to 5.3	<b>March 25</b>	10.2 (Project 1 Due)
Jan 29	5.4 to 5.5	March 27	10.2 Continued
Jan 31	5.6 to 5.7	March 30	11.1 to 11.3
Feb 3	5.8 to 5.10	April 1	11.4 to 11.5
Feb 5	6.1 to 6.3	April 3	11.6 to 11.7
Feb 7	6.4	April 6	11.8 to 11.9
Feb 10	6.5 to 6.6	April 8	11.10 to 11.11
Feb 12	7.1 to 7.2		
<b>Feb 14</b>	<b>EXAM 1 (Chapters 2, 3, 4, 5)</b>	April 10	11.12
Feb 17	7.3 to 7.4	April 15	12.4 to 12.6
Feb 19	7.5 to 7.7	<b>April 17</b>	<b>EXAM 3 (Chapters 9, 10)</b>
Feb 21	7.8 to 7.10	April 20	12.7 to 12.9
Feb 24	8.1 to 8.3	April 22	12.10 to 12.12
Feb 26	8.4	April 23, 24	Reading Days
Feb 28	8.5 to 8.6	<b>April 25-May 1</b>	<b>Final Exam Week</b>
March 2	Spring Break		<b>(Final Exam is comprehensive)</b>
		<b>April 29</b>	<b>8<sup>th</sup> Period Class: 7:30am-9:30am</b>
		<b>April 30</b>	<b>5<sup>th</sup> Period Class: 10:00am-12:00 noon</b>

15. **Attendance and Expectations:** Each section is treated as a separate class. Quizzes are given at random and cannot be swapped between sections. Attendance is strongly recommended. Irregular attendance always results in poor or mediocre performance. It is expected that 3 to 5 study hours for each contact hour are to be spent every week studying for this class. If a week is missed, the study hours need to be made up in the following weeks. The instructor may give an in-class problem (quiz) which counts as part of the homework. **Re-grading Policy:** Any re-grade requests must be submitted in writing **within 5 days after return of the graded paper.** The written request must explain in detail what

you want the grader to do and where you believe he/she has made a mistake in grading. **These requests will be accepted by Dr. Sherif only as a hardcopy. No email submissions will be accepted.** The request must have a date on the top of the page, your name, your telephone number(s), and e-mail address. **Policy on Homework Assignments:** Homework problems will be assigned via Canvas and submitted through Canvas. **No email or hard copy submissions will be accepted.** Only two problems will be graded at random. Homework papers will not be returned, but a correct solution will be posted on Canvas. You may upload homework assignments early, but not past the due date. The assignments will be due at 11:59pm on the due date. After that, the system will stop accepting the assignments. Late homework is not accepted via any other means. **Miscellaneous Policies:** Students will be held responsible for knowledge of all scheduling and policy announcements made in class. You may call Dr. Sherif or send him an e-mail 24 hours a day, 7 days a week. Please make sure you leave a phone number if you call and can't find him. If you send an e-mail please also list a phone number where you could be reached. Dr. Sherif will return your call within a few hours. Sending an e-mail along with the voice message can also help alert him to your request.

**16. Grading:**

Homework	7%
Project 1	3%
Project 2	5%
Exam #1	20%
Exam #2	20%
Exam #3	20%
Final Exam	25%

**17. Grading Scale:**

A	90-100		
A-	86-90	B+	82-86
B	78-82	B-	74-78
C+	70-74	C	66-70
C-	62-66	D+	58-62
D	54-58	D-	50-54
E	0-50		

**18. Make-up Exam Policy:** **There will be no make-up exams.** Unless there is a **documentable extreme medical emergency**, no credit will be given for a missed exam. It is the student's responsibility to make sure he/she is available to take the exam. **All three midterm exams will be given in the evening (Periods E2 and E3) in a classroom to be designated in advance. Midterm exams will be the same for both sections of this class and will be given on the same day and the same time period but in two different classrooms.**

**19. Honesty Policy** – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

**20. Accommodation for Students with Disabilities** – Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

**21. UF Counseling Services** – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling

**22. Software Use** – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the

individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.