

Department Name and Number _____	
Current SCNS Course Identification Prefix ____ ____ ____    Level ____    Course Number ____ ____ ____    Lab Code ____ Course Title _____	
Effective Term and Year _____	Terminate Current Course <input type="checkbox"/> Other Changes (specify below) <input type="checkbox"/>

Change Course Identification to:

Prefix \_\_\_\_ \_\_\_\_ \_\_\_\_    Level \_\_\_\_    Course Number \_\_\_\_ \_\_\_\_ \_\_\_\_    Lab Code \_\_\_\_

Full Course Title \_\_\_\_\_

Transcript Title (please limit to 21 characters) \_\_\_\_\_

Credit Hours: From ____ To ____	Contact Hours: <input type="checkbox"/> Base or <input type="checkbox"/> Headcount From ____ To ____
Rotating Topic: From <input type="checkbox"/> yes <input type="checkbox"/> no To <input type="checkbox"/> yes <input type="checkbox"/> no	S/U Only: From <input type="checkbox"/> yes <input type="checkbox"/> no To <input type="checkbox"/> yes <input type="checkbox"/> no
Variable Credit: From <input type="checkbox"/> yes <input type="checkbox"/> no To <input type="checkbox"/> yes <input type="checkbox"/> no If yes, ____ minimum and ____ maximum credits/semester	Repeatable Credit: From <input type="checkbox"/> yes <input type="checkbox"/> no To <input type="checkbox"/> yes <input type="checkbox"/> no If yes, ____ total repeatable credit allowed

Prerequisites	Co-requisites
From _____ To _____	From _____ To _____

Course Description (50 words or less; if requesting a change, please attach a syllabus)

From _____	To _____
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Rationale /Place in Curriculum/Impact on Program

\_\_\_\_\_

Department Contact	Name _____	Phone _____	Email _____
College Contact	Name _____	Phone _____	Email _____

## **Syllabus**

### **EML5515 Gas Turbines and Jet Engines**

1. Catalog Description (including credit hours) – Theory and analysis of gas turbine engines and major components (3 credit hours)
2. Pre-requisites and Co-requisites: EGN3353C or equivalent
3. Course Objectives: This is an intermediate graduate level course that prepares students to:
  - a. Utilize the fundamental principles of fluid mechanics and thermodynamics to analyze aircraft engines.
  - b. Understand the common gas turbine aircraft propulsion systems and be able to determine the applicability of each.
  - c. Perform system studies of aircraft engine systems for specified cruise conditions at the preliminary design level.
  - d. Perform preliminary aerothermal design of turbomachinery components.
  - e. Analyze and perform preliminary design of terrestrial gas turbine systems, including alternative cycles.
4. Instructor: William E. Lear
  - a. Office location: 105 MAE-C
  - b. Telephone: 392-7572
  - c. E-mail address: lear@ufl.edu
  - d. Office hours: T 10:30 – 11:30 a.m. and Th 1:30 – 3:00 p.m.
5. Teaching Assistant: To be announced
6. Meeting Times MWF 4<sup>th</sup> period
7. Class/laboratory schedule: Class meets for three 50 min sessions per week. There is no lab component.
8. Meeting Location: To be announced
9. Material and Supply Fees: No material or supply fee
10. Textbooks and Software Required
  - a. Title: Mechanics and Thermodynamics of Propulsion
  - b. Author: Hill and Peterson
  - c. Publication date and Publisher: 1992, Addison-Wesley, 2<sup>nd</sup> Edition

### 11. Course Outline by Week

Per iod	Date	Subject	Text ref.
1	8/22	Introduction	1.1 – 1.3
2	24	Conservation Eqns	2.1 – 2.3
3	27	“”	
4	29	Equilibrium Combustion	2.4
5	31	“”	
6	9/5	Equil. Comb with STANJAN	
7	7	Review of Gasdynamics	3.1 – 3.2
8	10	“”	3.3 – 3.5
9	12	“”	3.6
10	14	Examples	
11	17	Thermo of jet engines	5.1 – 5.2
12	19	Review	
	19	<b>Test #1</b> 8:20-10:10 pm	
13	21	Thermo of jet engines	5.1 – 5.2
14	24	Ramjets	5.3
15	26	Gas turbine engines	5.4 – 5.6
16	28	“”	
17	10/1	Engine/aircraft performance	5.7 – 5.8
18	3	“”	
19	5	Inlets, combustors & nozzles	6.1
20	8	Inlets	6.2 – 6.3
21	10	Combustors	6.4 – 6.6
22	12	“”	
23	15	Nozzles	6.7
24	17	Review	
	17	<b>Test #2</b> 8:20-10:10 pm	
25	19	Axial compressors	7.1 – 7.3
26	22	Single and multi-staging	7.4 – 7.5
27	24	Instabilities	7.6
28	26	Efficiency	7.7 – 7.8
29	29	Radial equilibrium	7.9
30	31	Centrifugal compressors	9.1 – 9.2
31	11/2	Axial turbines	8.1 – 8.3
32	5	“”	
33	7	Cooling and performance	8.5 – 8.6
34	14	Matching compressor & turbine	8.7
35	16	Examples	
36	19	Review and project assignment	
	19	<b>Test #3</b> 8:20-10:10 pm	
37	26	Intro to terrestrial gas turbines	Notes
38	28	Terrestrial systems	”

39	30	Combined cycles	”
40	12/3	Advanced cycles	”
41	5	Design project due	

## 12. Grading

- a. Homework 15%
- b. Project 15%
- c. Tests 30% Best score  
15% Worst score  
25% Other score

Homework is assigned weekly. Three in class exams are given during the semester. A design project is due the last day of classes. There is no final exam in the course.

## 13. Grading Scale:

A 93-100%; A- 89-92.99%; B+ 85-88.99%; B 81-84.99%;  
 B- 76-80.99%; C+ 72-75.99%; C 68-71.99%; C- 64-67.99%;  
 D+ 60-63.99%; D 56-59.99%; D- 52-55.99%; E <52%

“Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

14. Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

15. Honesty Policy – UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See <http://www.dso.ufl.edu/sccr/procedures/honorcode.php>

16. 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.
17. UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
  - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, <http://www.counseling.ufl.edu/cwc/Default.aspx>, counseling services and mental health services.
  - Career Resource Center, Reitz Union, 392-1601, career and job search services.
  - University Police Department 392-1111
18. 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.
19. Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>. “