

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>NEW COURSE PROPOSAL</b> <b>Undergraduate Programs</b>		UUPC Approval <u>4-26-21</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	<b>Department</b> Ocean & Mechanical Engineering <b>College</b> COECS (To obtain a course number, contact <a href="mailto:erudolph@fau.edu">erudolph@fau.edu</a> )		
<b>Prefix</b> EML  <b>Number</b> 4401	(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)  <b>Lab Code</b>	<b>Type of Course</b> <input type="text" value="Lecture"/>	<b>Course Title</b> Principles of Turbomachinery
<b>Credits</b> (Review Provost Memorandum)  3	<b>Grading</b> (Select One Option)  <b>Regular</b> <input checked="" type="radio"/> <b>Pass/Fail</b> <input type="radio"/> <b>Sat/UnSat</b> <input type="radio"/>	<b>Course Description</b> (Syllabus must be attached; Syllabus Checklist recommended; see Guidelines) Basic Principles Related to Gas Turbines, Applications to Stationary Power Generators and Aircraft Propulsion Systems, Guiding Principles in Gas Turbine Cycles, Design of Basic Components and their Performance prediction.	
<b>Effective Date</b> (TERM & YEAR)  Fall 2021	<b>Prerequisites, with minimum grade*</b> EML 3701 Fluid Mechanics		<b>Registration Controls</b> (Major, College, Level)
<i>*Default minimum passing grade is D-. Prereqs., Coreqs. &amp; Reg. Controls are enforced for all sections of course</i>			
<b>WAC/Gordon Rule Course</b> <input type="radio"/> Yes <input checked="" type="radio"/> No  WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See <a href="#">WAC Guidelines</a> .		<b>Intellectual Foundations Program (General Education) Requirement</b> (Select One Option)  None  General Education criteria must be indicated in the syllabus and approval attached to the proposal. See <a href="#">GE Guidelines</a> .	
<b>Minimum qualifications to teach course</b> Ph.D Degree in Mechanical or Aerospace Engineering and equivalent			
<b>Faculty Contact/Email/Phone</b> D. Moslemian/moslemia@fau.edu 297-2652		<b>List/Attach comments from departments affected by new course</b>	
<b>Approved by</b> Department Chair <u>Michael Schaub</u> College Curriculum Chair <u>Daniel Meeroff</u> College Dean <u>Fred Bloetscher</u> UUPC Chair <u>Jerry Haky</u> Undergraduate Studies Dean <u>Edward Pratt</u> UFS President _____ Provost _____			<b>Date</b> <u>4-2-21</u> <u>4-15-21</u> <u>4-15-21</u> <u>4-26-21</u> <u>4-26-21</u> _____ _____

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

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Course Syllabus**

<b>1. Course title/number, number of credit hours</b>	
<b>Principles of Turbomachinery/ EML 4401</b>	3 credit hours
<b>2. Instructional Method</b>	
<p>This class consists of lectures which will be conducted in-class and/or live using WebEx or Zoom, and recorded so students can watch the lectures at a later time and date. . Students will be accommodated as much as possible with their needs during the pandemic.</p> <p><b><u>You will need to have a computer (or laptop), a reliable WIFI access, and a webcam and micro-phone connected to your computer for this course.</u></b></p> <p>In the event you might not have a computer, there is a Laptop Loaner Program at FAU for first-generation, low-income students. <a href="https://www.fau.edu/newsdesk/articles/fau-announces-laptop-loaner-program.php">https://www.fau.edu/newsdesk/articles/fau-announces-laptop-loaner-program.php</a></p> <p>In the event you might not have reliable internet access remotely, you may use the internet connection on campus. You may use the classroom during the live course times for watching lectures and taking exams. Note that there are only reduced seating capacities in the classroom, and only those who do not have reliable internet access should use the classroom. Social distancing must be strictly followed in the classroom at all times. You will need to make reservation for your seating every week on Canvas. The instructions for the reservation are provided at the following link: <a href="https://fau.edu/oit/instructional/support/files/seatReservationTool_student.pdf">https://fau.edu/oit/instructional/support/files/seatReservationTool_student.pdf</a></p> <p><b>According to Dec. 04, 2020 directive memorandum from Provost’s office:</b> ” <b>After two full weeks of face to face instruction with consecutive ‘no show’ of any students in person in the classroom, the modality of this course section may be changed to remote instruction only at the discretion of the university.</b>”</p>	
<b>3. COVID 19 Statement</b>	
<p>All students in face-to-face classes are required to wear masks during class, and students must sanitize their own workstations upon entering the classroom. Taking these measures supports the safety and protection of the FAU community. Students who do not adhere to these rules will be asked to leave the classroom and/or be removed from the course. Students experiencing flu-like symptoms (fever, cough, shortness of breath), or students who have come in contact with an infected person should immediately contact FAU Student Health Services (561-297-3512).</p>	
<b>4. Course pre-requisites, co-requisites, and where the course fits in the program of study</b>	
<p><b>List Prerequisites, Co-requisites:</b></p> <p>Prerequisites: EML 3701 - Fluid Mechanics</p> <p>If students have not completed the required prerequisites for the course and do not inform their course instructor and advisor, they will be dropped from the course. If this occurs after the first week of the semester, they will be fee liable to the University.</p>	
<b>5. Course logistics</b>	
<p><b>Term:</b> Fall 2021</p> <p><b>Class location and time:</b> Lecture Hours: TTH 3:30—4:50PM, General Classroom North- Rm 102, Via Lecture Capture posted on CANVAS with 20-25% in Class., <b>see reservation link below:</b></p>	

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Student Guide:

[https://fau.edu/oit/instructional/support/files/seatReservationTool\\_student.pdf](https://fau.edu/oit/instructional/support/files/seatReservationTool_student.pdf)

Exams will be given online only at the scheduled times. No make-ups, except in documented emergencies. Other logistics are as follows:

1. Canvas registration is required.
2. The instructor will regularly post materials/announcements on Canvas. It is student's responsibility to regularly check Canvas and their FAU email for the most recent information.
3. No hard-copy handouts will be provided. Copies will be posted in files on Canvas
4. All classes will be virtual via Recorded Lectures posted Wed. & Fridays on CANVAS. You are expected to participate in all sessions and keep up with the material.
5. Participation in University-approved activities or religious observances, with prior notice, will not be penalized.
6. Students need a reliable internet condition capable of streaming CANVAS or WebEx lectures, taking exams on Canvas, etc. Recommended: Broadband Internet connection with a speed of 4 Mbps or higher. To function properly, Canvas requires a high-speed Internet connection (cable modem, DSL, satellite broadband, T1, etc.). The minimum Internet connection speed to access Canvas is a consistent 1.5 Mbps (megabits per second) or higher. Check your Internet speed here.
7. Students should have an operational computer system equipped with Windows 10 or macOS Sierra (or higher), Microsoft Office, web browser, a webcam, speakers, and microphone, which should be compatible with the most recent version of LockDown Browser, Respondus Monitor, Cisco WebEx, etc.
8. All exams will be held using LockDown Browser and Respondus Monitor, or similar features, as determined by the instructor. More information will be provided as we get closer to exams. You must be able to scan exam solutions and upload them to Canvas during tests. Please test this BEFORE the exam. This is subject to change as technology changes.
9. All questions must be sent through Canvas. Only personal or confidential matters should be sent via email to the professor.
10. These are the links where you can find the steps to use your cell phone as a webcam.

**For Android:**

<https://helpdesk.fau.edu/TDClient/2061/Portal/KB/ArticleDet?ID=104057>

**For iPhone or iPad**

<https://helpdesk.fau.edu/TDClient/2061/Portal/KB/ArticleDet?ID=104056>

11. Tests are open book.

More details will be announced throughout the semester. It is students' responsibility to review and follow communications posted by the instructor.

**6. Instructor contact information**

<i>Instructor's name</i>	Dr. Davood Moslemian,
<i>Office address</i>	Rm. 107, Eng. West Bldg.
<i>Office Hours</i>	WF: 11:30 AM – 2:00 PM
<i>Contact telephone number</i>	561 297-2652
<i>Email address</i>	E-mail: <a href="mailto:moslemia@fau.edu">moslemia@fau.edu</a>

**7. TA contact information**

<i>TA's name</i>	To be announced.
<i>Office address</i>	
<i>Office Hours</i>	
<i>Contact telephone number</i>	
<i>Email address</i>	

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<b>8. Course description</b>	
Basic Principles Related to Gas Turbines, Applications to Stationary Power Generators and Aircraft Propulsion Systems, Guiding Principles in Gas Turbine Cycles, Design of Basic Components and their Performance prediction.	
<b>9. Course objectives/student learning outcomes/program outcomes</b>	
<i>Course objectives</i>	The objective is to provide the background and working knowledge of each component of a typical gas- turbine system. Component matching and environmental impact of gas turbines are also discussed.
<i>Student learning outcomes &amp; relationship to ABET 1-7 objectives</i>	<p>Student Learning Outcomes: (letters in parentheses indicate correlation of the outcome with the appropriate program assessment outcomes 1-7)</p> <ol style="list-style-type: none"> <li>1. The student will be able to show how the principles of thermodynamics and fluid mechanics as well as heat transfer can be applied to the solution of practical engineering problems. (1,2,6)</li> <li>2. The student will understand the performance characteristics of turbo-machinery devices such as compressors and turbines. (1,2,6)</li> <li>3. The student will be able to analyze performance characteristics of various types of gas turbines based on inlet and operating conditions (1,2,6)</li> </ol>
<b>10. Course evaluation method</b>	
<p>Homework and Project Assignments: 30% Midterm and Final Exams each: 35%</p> <p><b>Only the assigned Course Textbook can be used during the exams.</b></p>	<p><i>Note:</i> The minimum O&amp;ME grade requirement in the course is C.</p>
<b>11. Course grading scale</b>	
<p>Grading Scale:</p> <p>92 and above: "A", 88-92: "A-", 84-88: "B+", 80-84: "B", 76-80 : "B-", 72-76: "C+", <b>68-72: "C"</b>, 64-68: "C-", 60-64: "D+", 56-60: "D", 52-56: "D-", 52 and below: "F."</p>	
<b>12. Policy on makeup tests, late work, and incompletes</b>	
<p><i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency before the tests that prevented the student of participating in the exam. Makeup exams should be administered and proctored by department personnel unless there are other pre-approved arrangements.</p> <p><b>Late work without verifiable justification will NOT be graded.</b></p> <p><i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.</p> <ol style="list-style-type: none"> <li>1. Project reports are due on or before the assigned due date. <b>No Late Reports.</b></li> <li>2. Reports should be written according to the provided format.</li> <li>3. Reports should be typed.</li> </ol>	
<b>13. Special course requirements</b>	
<b>14. Classroom etiquette policy</b>	
University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones, are to be turned off in class sessions.	

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<b>15. Attendance Policy Statement</b>
<p>Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.</p> <p>Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.</p>
<b>16. Disability Policy Statement</b>
<p>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) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at <a href="http://www.fau.edu/sas/">www.fau.edu/sas/</a></p>
<b>17. Counseling and Psychological Services Center</b>
<p>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 <a href="http://www.fau.edu/counseling/">http://www.fau.edu/counseling/</a></p>
<b>18. Code of Academic Integrity Policy Statement</b>
<p>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 <a href="http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf">www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf</a></p> <p>Cell phones are not allowed during exams. If cell phones are detected during any exam periods, this will result in a <b>grade of "zero" on that exam and a note in the student's academic file.</b></p>
<b>19. Required texts/reading/Lab kits</b>
<p><b>Gas Turbine Theory, Saravanamuttoo, et al. 7th Edition, Pearson, 2017., ISBN: 9 781292093093</b></p>
<b>20. Supplementary/recommended readings</b>
<b>21. Course topical outline, including dates for exams/quizzes, papers, completion of reading</b>

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Course Topics:

1. Introduction: History of Gas Turbine
2. Thermodynamics
3. Fluid Mechanics
4. Combustion
5. Shaft- Power Gas Turbines
6. Gas Turbines for Aircraft Propulsion
7. Compressors
8. Turbines
9. Inlets, Combustion Chambers and Nozzles
10. Component Matching
11. Environmental Considerations

Test Dates:

1. **Mid Term:** Exact date TBA two weeks in advance.
2. **Final Exam: 1:15-3:45 PM Thursday Dec. 9, 2021.**

- No cell-phones, i-pads, or other electronic devices are allowed during any of the exams or quizzes.
- No watches capable of taking pictures or communicating with others are allowed during exams.
- If, because of an emergency, there is a need to carry an electronic device to the exam, you must secure permission from the instructor.

Violation of any of the above exam rules will, at a minimum, result in receiving a zero on the exam.