

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

1. Course title/number, number of credit hours	
EGM 4045 – Electro-Mechanical Devices	3 credit hours
2. Course pre-requisites, co-requisites, and where the course fits in the program of study	
<p>Prerequisites:</p> <ol style="list-style-type: none"> 1. Eng Math I (MAP 3305) or Differential Equations (MAP 2302) 2. Physics for Engineers II (PHY 2044) 3. Introduction to Programming for Ocean and Mechanical Engineers (EOC 4133) or Comp Apps in Eng I (EGN 2213) <p>All with a grade of C or above</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>	
3. Course logistics	
<p>Term: Fall 2020 Lectures: TR 12:30-1:50pm Labs: F 9:30-10:50am, 12:30-1:50pm in EW162</p> <p>Boca Raton Campus (EE 106)</p>	
4. Instructor contact information	
<i>Instructor's name</i>	Dr. An
<i>Office address</i>	Rm 174, Building 36, Boca Raton Campus
<i>Office Hours</i>	1-3pm (TR)
<i>Contact telephone number</i>	561-297-2792
<i>Email address</i>	pan@fau.edu
5. TA contact information	
<i>TA's name</i>	TBD
<i>Office address</i>	
<i>Office Hours</i>	
<i>Contact telephone number</i>	
<i>Email address</i>	
6. Course description	
Introduction to basic DC and AC circuits; passive and active filtering; DC and AC motors; and Arduino micro-controller for hardware and software interfaces.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	This course is designed to introduce the students to concepts: 1) analysis of basic DC and AC circuits; 2) analysis and design of simple passive and active filtering; 3) basic operations of DC and AC motors; and 4) micro-controller for sensor and actuator interfaces.
<i>Student learning outcomes & relationship to ABET a-k objectives</i>	<ol style="list-style-type: none"> 1. Students will be able to analyze DC circuits with multiple sources. (1,2,6) 2. Students will be able to use phasors to analyze frequency response and power in AC circuits. (1,2,6) 3. Students will understand the basic principles of AC and DC motors. (1) 4. Students will be able to analyze and design simple passive and active filters. (1,2,6)

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	<p>5. Students will be able to design hardware and software interfaces for simple analog and digital sensors. (1,2,6)</p> <p>6. Students will be able to design hardware and software interface for DC motor control. (1,2,6)</p>																								
8. Course evaluation method																									
<p>Labs – 20% (in-lab participation – 10%, and pre-lab calculations – 10%) Quizzes – 20% Exam 1 – 30% Exam 2 – 30% Final Exam – 30%</p> <p>The lowest quiz score will be dropped. If the overall grade by the last week of semester is maintained at 70% or above, the final exam can be waived. If possible, the final exam score will replace the lowest of any of the exam scores. Otherwise, the final exam score will not be included in the course grade.</p>																									
9. Course grading scale																									
<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 60%;">> 90.0</td><td>A</td></tr> <tr><td>86.7-90.0</td><td>A-</td></tr> <tr><td>83.3-86.7</td><td>B+</td></tr> <tr><td>80.0-83.3</td><td>B</td></tr> <tr><td>76.7-80.0</td><td>B-</td></tr> <tr><td>73.3-76.7</td><td>C+</td></tr> <tr><td>70.0-73.3</td><td>C</td></tr> <tr><td>66.7-70.0</td><td>C-</td></tr> <tr><td>63.3-66.7</td><td>D+</td></tr> <tr><td>60.0-63.3</td><td>D</td></tr> <tr><td>56.7-60.0</td><td>D-</td></tr> <tr><td>< 56.7</td><td>F</td></tr> </table>		> 90.0	A	86.7-90.0	A-	83.3-86.7	B+	80.0-83.3	B	76.7-80.0	B-	73.3-76.7	C+	70.0-73.3	C	66.7-70.0	C-	63.3-66.7	D+	60.0-63.3	D	56.7-60.0	D-	< 56.7	F
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10. Policy on makeup tests, late work, and incompletes																									
<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><i>Late work without verifiable justification will NOT be graded.</i></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>																									
11. Special course requirements																									
N/A																									
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, are to be turned off in class sessions.																									
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																									

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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

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/reading

Fundamentals of Electric Circuits, 4,5,6th edition, C.K. Alexander, M.N.O. Sadiku, McGraw-Hill Publishing

Power-point lecture notes

17. Supplementary/recommended readings

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

Tentative Course Topics:

1. Characteristics of resistance, inductance and capacitance components
2. Series and parallel connections of components
3. Circuit Simulator (Micro-Cap)
4. Analysis of circuits using Kirchhoff laws and Ohm's law
5. DC and AC circuits using nodal and mesh analyses
6. Sinusoids and phasors in AC circuits
7. Power and frequency response analysis in AC circuits
8. Basic characteristics about AC and DC motors
9. Arduino hardware and software interfaces

Important Dates

The last day to drop the course without receiving an F in the course: XXXX, 2020

Quiz: Only on Thursdays (about 15 minutes each, at the beginning of class). Tentatively, there is approximately 1 quiz per week unless otherwise stated.

Exam 1: TBD
Exam 2: TBD
Final Exam: TBD

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Lab Policy

Lab work is an important part of the course because it provides the hands-on experiences and skills needed for your senior design project. Do not sit back and let others do your lab work. Students will be assigned to do each lab in groups of 5 or 6, and the assignments will be rotated from one lab to another. For every lab, there are pre-lab and in-lab participation components unless otherwise stated.

NOTE: If you fail to show up in a given lab, you will receive 0% for that in-lab participation.

Pre-Lab Work

In every lab handout, there is a pre-lab section that specifies the required work to be done individually. The pre-lab work generally involves going over components' data sheets, doing basic analysis to predict what the measurements should be, and perform simple circuit design and/or software programming needed for the lab work. Unless otherwise stated, complete all the pre-lab assignments given in every lab handout before coming to the lab. The assignments must be **computer typed (no hand-writing and illegible scribbles)**, submitted to Canvas no later than 9am on every lab day. Points will be deducted if the assignment submission is late. The content must be organized, and follows the order listed in each handout. Points will be deducted if you fail to meet the above requirements.

In-Lab Work

The in-lab work involves performing a significant amount of hands-on group work on wiring, programming and troubleshooting. This will build up your confidence and competence needed in tackling the senior design project. Show up in every lab on time! Since all labs are performed in groups, being tardy or absent will greatly jeopardize your group from completing the lab work within an allotted time period. **If you are late for more than 10 minutes for a given lab without informing the instructor in advance, you will receive 0% for that lab.** During any lab period, you must not do anything not related to the lab content (e.g. surfing online, listen to music, texting, talking about unrelated topics, etc). If there is an emergency and you cannot make it to a lab, you must inform the instructor ahead of time (email, phone call). If the excuse is valid and there are evidences that support your claim, you may make up the lab at a later time or day. You must bring a hardcopy of the lab handout in every lab. Record ALL the measurements with proper values and units. Don't rely on your team members to do that for you. **You will be graded based on your level of participation during every lab.**