

FLORIDA A&M UNIVERSITY – FLORIDA STATE UNIVERSITY College of Engineering
Department of Electrical and Computer Engineering

Fall 2023
EEL3112

Advanced Circuits with Computers

College of Engineering (CoE) B-136
Tue/Thu, 11:00 AM – 12:15 PM

Instructor: Prof. Jinyeong Moon
CoE B-368
(850) 410-6584
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Schedule: Class
Tue/Thu 11:00 AM – 12:15 PM @ B-136
Office Hours
Tue/Thu 10:00 AM – 11:00 AM @ B-368

Course Objectives

Upon the completion of this course, the student will be able to:

- (1) Calculate the average power absorbed by an element in an AC circuit
- (2) Identify the relationships between the phase voltages, line voltages, the phase currents, and the line currents of a three-phase circuit.
- (3) Calculate average power absorbed by a balanced three-phase load.
- (4) Derive the transient response of a first-order circuit and of a second-order circuit.
- (5) Plot the transient response of an RLC circuit with a SPICE-based program.
- (6) Identify the characteristics of an ideal transformer.
- (7) Introduce the characteristics of a two-port network using two-port parameters.
- (8) Derive the transfer function of a RLC circuit.
- (9) Construct the Bode plots for a given transfer function.
- (10) Plot the frequency response of an RLC circuit with a SPICE-based program.

Course Topics

- (1) Review of AC Steady-state Circuit Analysis
- (2) Steady-state Power Analysis
- (3) Transient and Forced Response of RL, RC, and RLC Circuits
- (4) 3-phase AC Circuits with an Introduction to Transformers
- (5) Frequency Response of Linear Circuits
- (6) Circuit Simulation using Computers (PSPICE or MATLAB)
- (7) Introduction to Two-port Networks

Prerequisites and Co-requisite

Prerequisite	EEL-3111	Introduction to Circuit Analysis
Prerequisite	EEL-3002L	ECE Engineering Tools Lab
Co-requisite	MAP-2302	Differential Equations

Course Textbook

[Required] Basic Engineering Circuit Analysis, 11th Edition, J. David Irwin and R. Mark Nelms

ABET Student Outcomes

H (The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.). The assessment tool is a research paper on a contemporary topic related to global and societal problems and how the advancements in electrical and computer engineering are helping in solving these problems.

Grading

The final grade is determined by the overall performance score:

A = 90 ~ 100; B = 80 ~ 89; C = 70 ~ 79; D = 60 ~ 69; F = < 60

The performance score considers:

Homework (25%), Midterm Exam (35%), and Final Exam (40%).

Homework assignments will be issued throughout the semester. The homework is due before the class on the due date. Late submissions are not accepted.

General Policy Statements

- First-day attendance is mandatory for FSU students, and first-week attendance is mandatory for FAMU students. Students not in class during the first day (FSU) or first week (FAMU) will be dropped from the course. This is a Title IV requirement involving federal financial aid. However, a student who was dropped from the course **may** re-register for it.
- **The detailed University attendance policy is presented in a separate section in the next page.**
- There is no makeup exam/quiz without a certified medical excuse or prior instructor approval. The corresponding exam/quiz score will be automatically zero.
- In the event of an excused absence for exams and quizzes, consult the instructor prior to the exam to discuss the proper procedure.
- Electronic devices, including **cell phones**, should not disrupt the lecture (**no sound, no vibration**).
- There will be no phone conversations or text messaging during class.
- Profanity, as well as ethnic, racial, or sexual remarks in my class, will not be tolerated and will result in a penalty for your grade.
- Grade disputes must be made within one week after the graded work has been returned to the student. The student will have the burden of proof to show why the student is correct.

Syllabus Change

Except for changes that substantially affect the implementation of the grading policy, grading scale, or grading (evaluation) statement, the syllabus is a guide for the course and is subject to change with advance notice.

Class Lecture Recording

In this class, consistent with state law and university policy, students are permitted to make recordings of class lectures for personal use only. As noted, sharing, posting, or publishing classroom recordings may subject you to honor code violations and legal penalties associated with theft of intellectual property and violations of other state laws. Moreover, students and educators have expressed concern that recording classroom activities may negatively impact the learning experience for others, especially in classes that involve questions, discussion, or participation. To protect a learning environment in which everyone feels free to experiment with ideas, we ask you refrain from recording in ways that could make others feel reluctant to ask questions, explore new ideas, or otherwise participate in class. Students must monitor their recordings so that they do not include participation by other students without permission. Students with disabilities will continue to have appropriate accommodations for recordings as established by the Office of Accessibility Services.

Academic Success

Your academic success is a top priority for Dr. Moon, FAMU, and FSU. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups such as veterans and students with disabilities.

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

The College of Engineering has a restrictive interpretation of what is considered a valid excuse for an absence. See <https://www.eng.famu.fsu.edu/undergraduate/student-handbook>. Students may request an “Official Student Excuse” from Student Services and Undergraduate Affairs, B-111. An excused absence does not necessarily excuse you from any missed course work. You must contact your course instructor to determine if you are eligible for any makeup assignments. Students should request an excused absence before it will occur if possible, or immediately upon their return to campus, and must bring verifiable documentation to justify the excuse. Excessive delay in requesting an excused absence or providing appropriate documentation may result in the request being denied. Deliberately providing false, forged, or misleading documentation may result in academic sanctions against the student.

Academic Honesty or Honor Policy

Academic Honesty or Honor Policy violations shall be reported, and appropriate actions will be taken by the Department Chair and Associate Dean, as appropriate for undergraduate or graduate students. Students are expected to uphold the University Student Code of Conduct and/or University Academic Honor Code for their home university, FAMU or FSU.

The **Florida A&M University** is committed to academic honesty and its core values which include scholarship, excellence, accountability, integrity, fairness, respect, and ethics. These core values are integrated into its academic honesty policy. Being unaware of the Academic Honesty Policy is not a defense to violations of academic honesty.

(Ref: <https://www.famu.edu/about-famu/leadership/board-of-trustees/policies.php>)

The **Florida State University** Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University."

(Ref: <http://fda.fsu.edu/Academics/Academic-Honor-Policy>)

University's Non-Discrimination Policy Statement

FAMU: <https://www.famu.edu/about-famu/leadership/division-of-legal-affairs/equal-opportunity-programs-and-labor-relations/policy-statement.php>

FSU: http://www.hr.fsu.edu/PDF/Publications/diversity/EEO_Statement.pdf

Americans with Disabilities Act

The universities value diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. We are committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the FAMU Center for Disability Access and Resources (CeDAR) or FSU Office of Accessibility Services (OAS) has been provided. This syllabus and other class materials are available in alternative format upon request.

- **FAMU students** with disabilities needing academic accommodation should:
 - 1) register with and provide documentation to FAMU CeDAR; **and**
 - 2) ensure a letter from CeDAR is sent to the instructor indicating the need for accommodation and type.
 - For more information about services available to FAMU students with disabilities, contact:

Center for Disability Access and Resources (CeDAR)

Florida A&M University

1735 Wahnish Way, Suite 102, Tallahassee, FL 32307

(850) 599-3180 (voice); (850) 561-2513 (fax)

cedar@famuedu.edu;

<https://www.famuedu.edu/students/student-resources/center-for-disability-access-and-resources/index.php>

- **FSU students** with disabilities needing academic accommodation should:
 - 1) register with and provide documentation to the OAS;
 - 2) request a letter from OAS to the instructor to be sent to the instructor indicating the need for accommodation and what type; and
 - 3) meet (in person, via phone, email, skype, zoom, etc.) with each instructor to whom a letter of accommodation was sent to review approved accommodations.
 - For more information about services available to FSU students with disabilities, contact the **Office of Accessibility Services (OAS)**:

Florida State University
Tallahassee Campus
874 Traditions Way
108 Student Services Building
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
oas@fsu.edu
<http://dsst.fsu.edu/oas>

Florida State University
Panama City Campus
Office of Student Affairs
2nd floor Barron Building, Room 215
Panama City, FL. 32405
(850) 770-2172 (voice)
(866) 693-7872 (toll-free)
sds@pc.fsu.edu
<http://pc.fsu.edu/students/student-affairs/sas>

Confidential Campus Resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

FAMU students

Victim Advocate Program
1676 S Martin Luther King Jr Blvd
302 C.C. Cunningham Building
(850) 412-5667

<https://www.famu.edu/students/student-resources/victim-advocate-program/index.php>

Office of Counseling Services
636 Gamble Street
(850) 599-3145 (voice)
(850) 599-8481 (fax)

counseling@famu.edu
<https://www.famu.edu/students/student-resources/health-and-wellbeing/counseling-services/index.php>

Student Health Services
1700 Lee Hall Drive
116 Foote-Hilyer AC
(850) 599-3777 (voice)
(850) 412-5643 (fax)

<https://www.famu.edu/students/student-resources/health-and-wellbeing/health-services/index.php>

FSU students

Victim Advocate Program
University Center A, Rm. 4100
(850) 644-7161
Available 24/7/365

Office Hours: M-F 8-5
<https://dsst.fsu.edu/vap>

Counseling and Psychological Services
Askew Student Life Center, 2nd floor
942 Learning Way
(850) 644-8255

<https://counseling.fsu.edu/>

University Health Services
Health and Wellness Center
(850) 644-6230

<https://uhs.fsu.edu/>

Tentative Lecture Schedule: EEL3112 - Advanced Circuits with Computers (Fall 2023)					
Date	Day	Lecture	Topics	Textbook Chapters	Homework
08/29	Tue	1	Steady State Analysis	Chapter 8	HW1 Out
08/31	Thu	2	Complex Numbers	Chapter 8	
09/05	Tue	2 & 3	Complex Numbers / Steady State Power Calculations	Chapter 9	
09/07	Thu	3	Steady State Power Calculations	Chapter 9	HW1 Due & HW2 Out
09/12	Tue	3	Steady State Power Calculations	Chapter 9	
09/14	Thu	4	Steady State Power Calculations	Chapter 9	
09/19	Tue	4	Maximum Power Transfer	Chapter 9	
09/21	Thu	5	Magnetically Coupled Circuits - Mutual Inductance	Chapter 10	HW2 Due & HW3 Out
09/26	Tue	6 & 7	Linear Transformer & Ideal Transformer	Chapter 10	
09/28	Thu	8	Transformer Examples	Chapter 10	
10/03	Tue	9	Three-phase Circuits	Chapter 11	HW3 Due & HW4 Out
10/05	Thu	10	Three-phase Circuits	Chapter 11	
10/10	Tue	11	Three-phase Circuits	Chapter 11	HW4 Due
10/12	Thu		Review for Midterm Exam		
10/17	Tue		Midterm Exam (75 Minutes, Classroom)		
10/19	Thu	12	First Order Circuits	Chapter 7	HW5 Out
10/24	Tue	13	First Order Circuits	Chapter 7	
10/26	Thu	14	First Order Circuits	Chapter 7	
10/31	Tue	15	Second Order Circuits	Chapter 7, 12	HW5 Due & HW6 Out
11/02	Thu	16	Second Order Circuits	Chapter 7, 12	
11/07	Tue	17	Second Order Circuits	Chapter 7, 12	
11/09	Thu	18	Second Order Circuits	Chapter 7, 12	
11/14	Tue	19	Frequency Selective Circuits	Chapter 12	HW6 Due & HW7 Out
11/16	Thu	20	Frequency Selective Circuits	Chapter 12	
11/21	Tue	21	Frequency Selective Circuits	Chapter 12	
11/23	Thu		Thanksgiving - No Class		
11/28	Tue	22	Bode Diagram	Chapter 12	HW7 Due & HW8 Out
11/30	Thu	23	Bode Diagram	Chapter 12	
12/05	Tue	24	Two-port Networks		
12/07	Thu		Review for Final Exam		HW8 Due
12/11 Mon, 10:00AM			Final Exam (2 Hours, Classroom)		
12/20 Wed			Letter Grade Available on Registrar		

Syllabus Version: September 27, 2023