

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

---

Fall 2024 EEL3112	Circuit Analysis 2	College of Engineering (CoE) A-105 Mon/Wed, 11:00 AM – 12:15 PM
----------------------	--------------------	--

---

Instructor: Prof. Jinyeong Moon CoE B-368 (850) 410-6584 <a href="mailto:jmoon@eng.famu.fsu.edu">jmoon@eng.famu.fsu.edu</a>	Schedule: Class Mon/Wed 11:00 AM – 12:15 PM @ A-105 Office Hours Mon/Wed 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	Circuit Analysis 1
Prerequisite	EEL-3002L	ECE Engineering Tools Lab
Co-requisite	MAP-2302	Differential Equations

### **Course Textbook**

[Required] Basic Engineering Circuit Analysis, 11<sup>th</sup> 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 on 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 evaluation (grading) 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, Florida A&M University, and Florida State University. 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 written 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, B111. 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](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 the 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

CASS Building, 1735 Wahnish Way, Suite 102, Tallahassee, FL 32307

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

[cedar@famu.edu](mailto:cedar@famu.edu);

<https://www.famu.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 Office of Accessibility Services (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](mailto: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](mailto: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  
victimadvocate@famu.edu  
(850) 599-8785

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

Office of Counseling Services\*  
1735 Wahnish Way, Suite 304 (CASS Building)  
(850) 599-3145 (voice)  
(850) 599-8481 (fax)  
[counseling@famu.edu](mailto:counseling@famu.edu)  
<https://www.famu.edu/students/student-resources/health-and-wellbeing/counseling-services/index.php>

Student Health Services  
1735 Wahnish Way, Suite 104 (CASS Building)  
(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\*  
250 Askew Student Life Center  
942 Learning Way  
(850) 644-TALK (8255)  
Walk-in and Appointment Hours:  
M-F 8 am – 4 pm  
<https://counseling.fsu.edu/>

University Health Services  
Health and Wellness Center  
960 Learning Way  
(850) 644-6230  
<https://uhs.fsu.edu/>

\* The counseling offices' primary mission is to address psychological needs and personal concerns, which may interfere with students' academic progress, social development, and emotional well-being. Services may include in-person and virtual individual therapy, group therapy, crisis intervention, psychoeducational and outreach programming, after hours crisis hotline, and access to community providers for specialized treatment.

## **Additional Resources**

The FAMU-FSU College of Engineering website provides several resources, links, and deadlines that students should know about. These include:

<b>Important Deadlines</b> , including late drop/withdrawal, retroactive drop/withdrawal, and graduation application	<a href="https://www.eng.famu.fsu.edu/students/academic-deadlines">https://www.eng.famu.fsu.edu/students/academic-deadlines</a>
<b>Student Resources</b>	<a href="https://www.eng.famu.fsu.edu/student-resources">https://www.eng.famu.fsu.edu/student-resources</a>
<b>Undergraduate Student Handbook</b>	<a href="https://www.eng.famu.fsu.edu/undergraduate/student-handbook">https://www.eng.famu.fsu.edu/undergraduate/student-handbook</a>
<b>Graduate Student Resources links</b>	<a href="https://www.eng.famu.fsu.edu/student-resources">https://www.eng.famu.fsu.edu/student-resources</a>
<b>Program Outcomes/Student Learning Outcomes</b> for engineering programs	<a href="https://eng.famu.fsu.edu/about/accreditation">https://eng.famu.fsu.edu/about/accreditation</a>
<b>Academic Learning Compacts (ALC)</b> for degree programs	
COE	<a href="https://eng.famu.fsu.edu/about/accreditation/outcomes-alc-sacs">https://eng.famu.fsu.edu/about/accreditation/outcomes-alc-sacs</a>
FAMU	<a href="https://www.famu.edu/administration/strategic-planning-analysis-and-institutional-effectiveness/university-assessment/academic-learning/current-alcs.php">https://www.famu.edu/administration/strategic-planning-analysis-and-institutional-effectiveness/university-assessment/academic-learning/current-alcs.php</a>
FSU	<a href="https://provost.fsu.edu/outcomes/smalcs-report/">https://provost.fsu.edu/outcomes/smalcs-report/</a>
<b>Sexual Misconduct</b>	<a href="https://www.eng.famu.fsu.edu/sexual-misconduct">https://www.eng.famu.fsu.edu/sexual-misconduct</a>

Tentative Lecture Schedule: EEL3112 - Circuit Analysis 2 (Fall 2024)					
Date	Day	Lecture	Topics	Textbook Chapters	Homework
08/26	Mon	1	Steady State Analysis	Chapter 8	HW1 Out
08/28	Wed	2	Complex Numbers	Chapter 8	
09/02	Mon		Labor Day - No Class		
09/04	Wed	2 & 3	Complex Numbers / Steady State Power Calculations	Chapter 9	
09/09	Mon	3	Steady State Power Calculations	Chapter 9	HW1 Due & HW2 Out
09/11	Wed	3	Steady State Power Calculations	Chapter 9	
09/16	Mon	4	Steady State Power Calculations	Chapter 9	
09/18	Wed	4	Maximum Power Transfer	Chapter 9	
09/23	Mon	5	Magnetically Coupled Circuits - Mutual Inductance	Chapter 10	HW2 Due & HW3 Out
09/25	Wed	6 & 7	Linear Transformer & Ideal Transformer	Chapter 10	
09/30	Mon	8	Transformer Examples	Chapter 10	
10/02	Wed	9	Three-phase Circuits	Chapter 11	HW3 Due & HW4 Out
10/07	Mon	10	Three-phase Circuits	Chapter 11	
10/09	Wed	11	Three-phase Circuits	Chapter 11	HW4 Due
10/14	Mon		Review for Midterm Exam		
10/16	Wed		<b>Midterm Exam</b> (75 Minutes, Classroom)		
10/21	Mon	12	First Order Circuits	Chapter 7	HW5 Out
10/23	Wed	13 & 14	First Order Circuits	Chapter 7	
10/28	Mon	14 & 15	First & Second Order Circuits	Chapter 7, 12	HW5 Due & HW6 Out
10/30	Wed	16	Second Order Circuits	Chapter 7, 12	
11/04	Mon	17	Second Order Circuits	Chapter 7, 12	
11/06	Wed	18	Second Order Circuits	Chapter 7, 12	
11/11	Mon		Veteran's Day - No Class		
11/13	Wed	19	Frequency Selective Circuits	Chapter 12	HW6 Due & HW7 Out
11/18	Mon	20	Frequency Selective Circuits	Chapter 12	
11/20	Wed	21	Frequency Selective Circuits	Chapter 12	
11/25	Mon	22	Bode Diagram	Chapter 12	HW7 Due & HW8 Out
11/27	Wed		Thanksgiving - No Class		
12/02	Mon	23	Bode Diagram	Chapter 12	
12/04	Wed		Review for Final Exam		HW8 Due
12/12 Thu, 10:00AM			<b>Final Exam</b> (2 Hours, Classroom)	Syllabus Version: August 19, 2024	
12/17 Tue			Letter Grade Available on Registrar		