

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

Spring 2024
EEE4301

Electronics 2

College of Engineering (CoE) A-134
Mon/Wed, 2:00 PM – 3:15 PM

Instructor: Prof. Jinyeong Moon
CoE B-368
(850) 410-6584
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Schedule: Class
Mon/Wed 2:00 PM – 3:15 PM @ CoE A-134
Office Hours
Mon/Wed 1:00 PM – 2:00 PM @ CoE B-368

Course Objectives

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

- (1) Analyze and design an output stage and various classes of power amplifiers.
- (2) Understand, analyze, and design various operational amplifiers and related circuits.
- (3) Understand and analyze biasing and active load circuits.
- (4) Describe and determine the characteristics of differential amplifiers and multistage amplifiers.
- (5) Derive and determine the transfer function, the loop-gain, and the stability criteria of feedback circuits and systems.

Course Topics

- (1) Output Stages and Power Amplifiers
- (2) Ideal Operational Amplifiers and Op-Amp Circuits
- (3) Integrated Circuit Biasing and Active Loads
- (4) Differential and Multistage Amplifiers
- (5) Feedback and Stability

Prerequisite

EEE3300 Electronics

Course Textbook

Microelectronics Circuit Analysis and Design, 4th Edition, Donald Neamen

Grading

The final letter grade is determined by the overall performance score ranging from 0 to 100:

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

The overall performance score is calculated by:

Attendance and Quiz (10%), Homework (30%), Midterm Exam (30%), and Final Exam (30%).

One missed class will deduct 1 point from the overall performance score.

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

- Attendance is mandatory and will impact the final grading.
- 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.

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 law. 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 recording 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.

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.

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@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 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
<https://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: EEE4301 - Electronics 2 (Spring 2024)					
Date	Day	Lecture	Topics	Textbook Chapters	Homework
01/08	Mon		No Class - Professor's Schedule		-
01/10	Wed	1	Power and Thermal Considerations	Chapter 8	HW #1 out
01/15	Mon		No Class - MLK Day		
01/17	Wed	2	Power and Thermal Considerations	Chapter 8	HW #2 out
01/22	Mon	3	Amplifier Classes (Class A, B)	Chapter 8	
01/24	Wed	4	Amplifier Classes (Class A, B)	Chapter 8	
01/29	Mon	5	Amplifier Classes (Class AB, C)	Chapter 8	
01/31	Wed	6	Power Amplifier & Output Stage (Class A, AB)	Chapter 8	
02/05	Mon	7	Power Amplifier & Output Stage (Class AB)	Chapter 8	
02/07	Wed	8	Op-Amp & Amplifiers (Inverting, Summing, Non-inv.)	Chapter 9	HW #3 out
02/12	Mon	9	Op-Amp Applications (V/I Convs., Difference Amp.)	Chapter 9	HW #4 out
02/14	Wed	10	Op-Amp Applications (Instru. Amp., Integ., Diff.)	Chapter 9	
02/19	Mon	11	OTA & Op-Amp Designs	Chapter 9	
02/21	Wed	12	Op-Amp Designs	Chapter 9	
02/26	Mon		Midterm Review		
02/28	Wed		Midterm Exam		
03/04	Mon	13	BJT Current Sources	Chapter 10	HW #5 out
03/06	Wed	14	BJT/FET Current Sources	Chapter 10	
03/11	Mon		Spring Break		
03/13	Wed				
03/18	Mon	15	FET Current Sources	Chapter 10	HW #6 out
03/20	Wed	16	Active Loads	Chapter 10	
03/25	Mon	17	Small Signal Analysis of Active Loads	Chapter 10	
03/27	Wed	18	BJT Differential Amplifier	Chapter 11	HW #7 out
04/01	Mon	19	BJT/FET Differential Amplifier	Chapter 11	HW #8 out
04/03	Wed	20	Differential Amplifier with Active Load	Chapter 11	
04/08	Mon	21	Gain and Output Stage of a Differential Amplifier	Chapter 11	
04/10	Wed	22	Frequency Response of a Differential Amplifier	Chapter 11	
04/15	Mon	23	Feedback Basic	Chapter 12	HW #9 out
04/17	Wed	24	Feedback Topologies	Chapter 12	
04/22	Mon	25	Amplifiers with Feedback (Series-Shunt, Shunt-Series)	Chapter 12	
04/24	Wed		Final Exam Review		
05/02 Thu, 3:00 PM - 5:00 PM			Final Exam	Syllabus Version: December 30, 2023	
05/08 Wed			Letter Grade Available on Registrar		