FLORIDA POLYTECHNIC UNIVERSITY

Syllabus Template: 2025-2026

Note: The following, at a minimum, must be included on all course syllabi. It is extremely important that the syllabus is reviewed with the students at the start of the term, preferably on the first day of class.

Course Information

- **Course Number and Title**: **EEE 4376-Analog Integrated Circuits**
- **Credit Hours:** (if it's lecture/lab, indicate the breakdown (e.g. credits: 3 (2 lecture/1 lab): 3 credits: Lectures 3 Hours, Lab: 0
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor: Dr. Muhammad H Rashid**
- **Office Location: IST 1099**
- **office Hours**: TR: 11:00 am–12:00 pm and Fridays: 11:00 am–12:00 pm through Microsoft Teams or fac-to-face meeting; if unavailable, contact the instructor for a mutually convenient time
- **Email address**: mrashid@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: Explanation of class delivery mode/meeting times expectations, noting specifically (*does not apply to face-to-face courses*): IST 1045, TR: 4:00-5:15 pm
- **Course Website**: Canvas
- **Official Catalog Course Description**: Design and analysis of bipolar and MOS analog integrated circuits. Topics include operational amplifier design, analog multipliers, active loads, current sources, feedback, frequency response, and compensation. Emphasis on design and computer simulation
    - **Course Pre and/or Co-Requisites**: EEE 3351 Electronic Devices
    - **Communication/Computation Skills Requirement (6A-10.030)**: N (see catalog description. Identify course as "Gordon Rule" if you see the following in the description: This course meets communication/writing-intensive requirements (W)).
- **Required Texts and Materials:**

  Required: M. H. Rashid. (2017). *Microelectronic Circuits - Analysis and Design*, Cengage Publishing, ISBN # 13-9781305-63516-6 https://www.cengage.com/c/microelectronic-circuits-analysis-and-design-3e-rashid/9781305635166PF/

  Reference: Tony Chan Carusone, David Johns, Kenneth Martin: Analog Integrated Circuit Design, 2nd Edition. John Wiley, December 2011, 816 Pages, ISBN: 978-0-470-77010-8

Course Objectives and Outcomes

Course Objectives: .

- Covers the design guidelines and trade-offs of cascade connected and cascode-connected amplifiers with passive and active loads that would meet the certain design specifications.
- Covers the techniques for the analysis and design of feedback amplifiers and compensation for

bandwidth widening.

- Covers techniques for the design of high-gain bipolar, MOS and Bi- MOS differential amplifiers and op-amps.

- **Course Learning Outcomes (CLOs)**:

#	After successfully completing the course with a grade of C (2.0/4.0) or better, the student should be able to do the following:
1.	Design BJT and MOSFET constant-current sources
2.	Design BJT and MOS Differential Amplifiers to meet certain specifications
3.	Analyze and evaluate the performance of practical operational amplifiers
4.	Acquire and apply new knowledge in Analog Integrated Circuits
5.	Recognize ethical and professional responsibilities

Alignment with Student Outcomes (ABET)

The Electrical Engineering program at Florida Polytechnic University has aligned its Student Outcomes (SO) with ABET-EAC Criterion 3 Student Outcomes (1-7).

These outcomes are:

1. **Identify/Formulate**: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. **Apply Engineering Design**: An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. **Communicate Effectively**: An ability to communicate effectively with a range of audiences.
4. **Ethical/professional responsibilities**: An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. **Collaborate in a Team**: An ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. **Conduct Experimentation**: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. **Apply New Knowledge**: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

#	Student Outcomes (ABET)	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
1.	Identify/Formulate					
2.	Apply Engineering Design	x	x	x		
3.	Communicate Effectively				x	
4.	Ethical/professional responsibilities					x
5.	Collaborating in a Team					
6.	Conduct Experimentation					
7.	Apply New Knowledge				x	

Course Policies

Attendance

- Students in **face-to-face (this includes labs and C-courses)** courses are expected "to attend all of

their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP).

- Exceptions to any attendance requirements may be made on a case-by-case basis.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

- No makeup tests or quizzes, except in case of emergency, e.g. illness and accident. For makeup tests, a medical certificate is required and the instructor must be notified in advance of the test.
- Exceptions to any attendance requirements may be made on a case-by-case basis.

Grading Scale

The grading scale that will be used in the course is:. (See also University Grading Policy).

Grade	***A***	***A-***	***B+***	***B***	***B-***	***C+***	***C***	***D***	***F***
Percentage	**100-90**	**<90-87**	**<87-80**	**83-80**	**<80-77**	**<77-73**	**<73-70**	**<70-60**	**<60 -0**

Assignment/Evaluation Methods

Grade items: Quizzes, assignments, and Final Exam throughout the semester after the completion of a specific topic area – see the schedule for more details.	Points
Quiz on the course Syllabus	1
IEEE Code of Ethics	1
Pre and Post-Tests	1
Self-outcome assessment	1
Assignments	40
Midterm Exams	38
Attendance	6
Final Exam: Report on new knowledge and presentation	12
Total Departmental Requirements: Minimum 30% or higher must be in the individual in-class assessments and evaluations.	100

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Tutoring and Learning Center (TLC)**: : The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
- **Knack Tutoring:** Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapoly.edu/writingcenter.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations. If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal, and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible: DisabilityServices@floridapoly.edu; (863) 874-8770; www.floridapoly.edy/disability.

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discuss resources and options available.

Academic Integrity

Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in sanctions up to and including expulsion from the university.

Any "special" instructions that are appropriate for academic integrity and the course should go here.
(It is essential that a heading and a statement on what constitutes, includes, academic integrity be included in the syllabus, and that the students be made aware of academic integrity at the beginning of a course.)

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action). Recording class activities including, but not limited to, lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is prohibited.

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is ***prohibited****.*

Civility and Collegiality (optional statement)

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting each other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

Disclaimer: Changes in syllabus and assignment sheets may be modified as deemed appropriate. All changes will be announced in class and in Canvas Announcements.

Naming Files: Name the file as the Assignment or Exam, e.g. Assignment # 1, Midterm #1, etc. DO NOT Put any other extensions of your name, assignment description, course name, etc. Canvas recognizes your name, the course name and course number.

TENTATIVE COURSE SCHEDULE

weeks	Date	**Topics**	**Classes**	**Quiz**	**Assignments**
1.	Jan 12– 18	Read course syllabus and familiarize with CANVAS and LTspice/simulation/Mathcad	2	Syllabus Quiz	LTspice// Mathcad
2.	Jan 19 – 25	BJT Current Source	1		1
3.	Jan 26 –Feb 1	BJT Current Source	2		2
4.	Feb 2 – 8	MOSFET Current Source	2		3
5.	Feb 9 – 15	MOSFET Current Source (Career Day)	1		4
6.	Feb 16 – 22	MOSFET Current Source	2		5
7.	Feb 23–Mar 1	BJT Differential Amplifiers	2	Midterm Exam #1	6
8.	Mar 2 –Mar 8	BJT Differential Amplifiers	2		7
9.	Mar 9 – 15	BJT Differential Amplifiers	2	Midterm Grade March 9	8
10.	Mar 16 –22	Spring Break	0		
11.	Mar 23 –29	MOSFET Differential Amplifiers	2		9
12.	Mar 30–Apl 5	MOSFET Differential Amplifiers	2		10
13.	April 6 - 12	MOSFET Differential Amplifiers	2		11
14.	Apr 13 – 19	Practical Operational Amplifiers	2	Midterm Exam #2	12
15.	Apr 20 – 26	Practical Operational Amplifiers	2		13
16.	Apr 27 – 28	Reviews	1	Outcome Quiz	
17.	Apr 29–May 1	Reading Days	0		
18.	May 4 - 8	Final Exam	2		
		Total	29		

Note: The famous quote "Tell me and I forget; teach me and I may remember; involve me, and I learn."

WITHDRAWAL DATE WITHOUT ACADEMIC PENALTY DEADLINE (W ASSIGNED): APRIL 17, 2026