

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>COURSE CHANGE REQUEST</b> <b>Undergraduate Programs</b>		UUPC Approval <u>10-11-21</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	<b>Department</b> Electrical Engineering and Comp Science <b>College</b> Engineering and Computer Science		
<b>Current Course Prefix and Number</b> EEE 4361		<b>Current Course Title</b> Electronics 2	
<i>Syllabus must be attached for ANY changes to current course details. See <a href="#">Checklist</a>. Please consult and list departments that may be affected by the changes; attach documentation.</i>			
<b>Change title to:</b> Electronics II and Lab		<b>Change description to:</b> See attached syllabus for new course description.	
<b>Change prefix</b> From: _____ To: _____		<b>Change prerequisites/minimum grades to:</b> EEE 3300 and EEL 3118L with "C" or better	
<b>Change course number</b> From: <u>4361</u> To: <u>4361C</u>		<b>Change corequisites to:</b>	
<b>Change credits*</b> From: _____ To: _____		<b>Change registration controls to:</b>	
<b>Change grading</b> From: _____ To: _____		Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).	
<b>Change WAC/Gordon Rule status**</b> Add <input type="checkbox"/> Remove <input type="checkbox"/>			
<b>Change General Education Requirements***</b> Add <input type="checkbox"/> Remove <input type="checkbox"/>			
<small>*Review <a href="#">Provost Memorandum</a></small> <small>**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See <a href="#">WAC Guidelines</a>.</small> <small>***General Education criteria must be indicated in syllabus and approval attached to this form. See <a href="#">GE Guidelines</a>.</small>			
<b>Effective Term/Year for Changes:</b> Spring 2022		<b>Terminate course? Effective Term/Year for Termination:</b>	
<b>Faculty Contact/Email/Phone</b> Hanqi Zhuang, zhuang@fau.edu, 561-297-3413			
<b>Approved by</b> Department Chair _____ College Curriculum Chair <u>Dan Meeroff</u> College Dean <u>Fred Bloetscher</u> UUPC Chair <u>Dan Meeroff</u> Undergraduate Studies Dean <u>Edward Pratt</u> UFS President _____ Provost _____		<b>Date</b> 9/23/2021 <u>10-4-21</u> <u>10-4-21</u> <u>10-11-21</u> <u>10-11-21</u> _____ _____	

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

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 Course Syllabus

<b>1. Course title/number, number of credit hours</b>	
Electronics II and Lab – EEE 4361C	3 credit hours
<b>2. Course prerequisites, corequisites, and where the course fits in the program of study</b>	
Prerequisites: EEE 3300 and EEL 3118L with "C" or better	
<b>3. Course logistics</b>	
Term: TBD Class location and time:	
<b>4. Instructor contact information</b>	
Instructor's name Office address Office Hours Contact telephone number Email address	TBD
<b>5. TA contact information</b>	
TA's name Office address Office Hours Contact telephone number Email address	TBD
<b>6. Course description</b>	
Simulation and computer-aided analysis and design (with ADS) of multi-transistor BJT and MOSFET wideband amplifiers: Differential amplifiers, single-stage and multi-stage voltage amplifiers, amplifier bandwidth and feedback amplifiers. Hands-on lab experiments include: design of BJT wideband amplifiers, mini-project competitions and familiarization with industry-grade equipment such as network, logic and spectrum analyzers.	
<b>7. Course objectives/student learning outcomes/program outcomes</b>	
Course objectives	This course will provide the student with both the theory and applications of Differential Amplifiers, Power Amplifiers, High-Frequency Response of Transistor Amplifiers, Feedback in Electronic Amplifiers – Analysis, Design and applications involving the 555 Timer.
Student learning outcomes & relationship to ABET 1-7 outcomes	<ol style="list-style-type: none"> <li>1. The student will be able to analyze and design current mirror DC current sources. (1, 6)</li> <li>2. The student will understand the use of current sources for transistor biasing and loading. (1, 6)</li> <li>3. The student will be able to design multistage transistor amplifier (an op-amp implementation) to meet CMRR and input resistance specifications. (1, 6)</li> </ol>

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	<ol style="list-style-type: none"> <li>4. The student will understand the properties and design of the three basic BJT amplifier configurations - CE, CB and CC. (1, 6)</li> <li>5. The student will understand the high-frequency performance of all transistor amplifier configurations, including the Cascode Amplifier and the Miller Effect. (1, 6)</li> <li>6. The student will understand the Feedback concept, and ability to analyze the effect of feedback on an amplifier's voltage and current gains, input and output resistance and bandwidth. (1, 6)</li> <li>7. The student will learn the concept of the four amplifier types - voltage, current, transconductance and transresistance. (1, 6)</li> <li>8. The student will be able to design a feedback amplifier to meet gain, input and output resistance and bandwidth specifications. (1, 6)</li> <li>9. The student will be able to compensate for a feedback amplifier. (1, 6)</li> <li>10. The student will understand Class A and B power amplifiers - biasing, efficiency and crossover distortion elimination. (1,6)</li> <li>11. The student will be able to design a wide band audio amplifier. (1,6)</li> <li>12. The student will be able to design oscillators and one-shot multi-vibrators using the 555 timer. (1, 6)</li> <li>13. The student will be able to use ADS to analyze the amplifier's performance – including new skills such as multi-runs for parametric sweep, Monte-Carlo Simulation and Worst Case Analysis, use of ABM components and editing of EVAL and Breakout Components. (6)</li> <li>14. The student will understand Design Tradeoffs: Gain vs. Input Resistance vs. Bandwidth vs. Swing. (6)</li> </ol>
<b>8. Course evaluation method</b>	
<p>Homework - 24% (each 6.0%)  Midterm Exam - 34%  Participation - 8%  Extra Credit Assignment - 5%  Final Exam - 34%</p>	<p><i>Note:</i> The minimum grade required to pass the course is C.</p> <p>Honor Code: Your submitted assignments must be authentic without any attempt to duplicate the content of other material. Include references as needed to recognize existing documents when included in your submitted assignment. Submitted assignments containing duplicated material shall receive a grade of zero and the resulting academic penalties.</p>
<b>9. Course grading scale</b>	
Grading Scale:	

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"A", 90-100%	"B+", 84-80%	"B-", 70-74%	"C", 60-64%	"D+", 50-54%	"D-", 40-44%
"A-", 89-85%	"B", 79-75%	"C+", 65-69%	"C-", 55-59%	"D", 45-49%	39 and below: "F."

**10. Policy on makeup tests, late work, and incompletes**

*Makeup tests* are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements

*Late work* is not acceptable.

*Incomplete grades* are against the policy of the department. Unless there is solid evidence of a medical or otherwise serious emergency situation incomplete grades will not be given.

**11. Special course requirements**

TBD

**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 and laptops, are to be disabled in class sessions

Because each class will start promptly at the scheduled time, and because late arrivals are disruptive and inconsiderate not only to the Instructor but also to other students, if you are late, please enter as quietly as possible. If you must leave class early, please let the Instructor know before class begins. Any student who either continually arrives late for class or continually leaves class early will be administratively dropped from the class at the end of the semester. Therefore, schedule your class, work, childcare, babysitting, etc. so that you will be present for the entire class.

**13. Attendance policy statement**

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.

Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

**14. 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

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Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).

**15. Counseling and Psychological Services (CAPS) 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 provide 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. Code of Academic Integrity policy statement**

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 an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#). If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy—but be sure the college policy does not conflict with the University Regulation.

**17. Required texts/reading**

Textbook: Sedra and Smith "Microelectronic Circuits" 8th edition, Oxford Press.

**18. Supplementary/recommended readings**

TBD

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

Theory:

- BJT and MOSFET Single Stage Amplifiers
- BJT and MOSFET Differential Amplifiers and Multi-Stage Amplifiers
- BJT and MOSFET Amplifier Bandwidth and the Miller Effect
- BJT and MOSFET Feedback Amplifiers

Lab:

- Design of BJT Single Stage and Multi-Stage Differential Amplifiers - Gain and Bandwidth considerations
- RL and RLC Circuits and introduction to Oscillators
- 555 Timer Projects
- Feedback Amplifiers Analysis and Design
- Analog Discovery 2: Spectrum, Logic and Network Analyzers