Electronic Circuit Analysis I
ENGR 3452 & 3052

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https://calendly.com/ochoa-hector-a/office-hours (4 hours in advance)
Department: Department of Physics, Engineering and Astronomy
Class meeting time and place: Lecture – MWF 9:00 am – 9:50 am / STEM 111

Course Description:
Course involves CMOS digital circuits, structure of operational amplifiers, feedback concepts,
oscillators, small-signal analysis, load-line analysis and introduction to nonlinear electronic
circuits.

Text and Materials:
Microelectronic Circuits, Eight Edition, Adel S. Sedra; Kenneth C. (KC) Smith; Tony Chan

Course Calendar:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Chapter</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 15</td>
<td>Building Blocks of IC Amp.</td>
<td>8</td>
<td>No Lab</td>
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<tr>
<td>2</td>
<td>Jan 22</td>
<td>Differential and Multistage Amps.</td>
<td>9</td>
<td>No Lab</td>
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<tr>
<td>3</td>
<td>Jan 29</td>
<td>Differential and Multistage Amps.</td>
<td>9</td>
<td>Lab 1</td>
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<tr>
<td>4</td>
<td>Feb 5</td>
<td>Frequency Response</td>
<td>10</td>
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<tr>
<td>5</td>
<td>Feb 12</td>
<td>Frequency Response</td>
<td>10</td>
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<tr>
<td>6</td>
<td>Feb 19</td>
<td>Feedback</td>
<td>11</td>
<td>Lab 3</td>
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<tr>
<td>7</td>
<td>Feb 26</td>
<td>Feedback</td>
<td>11</td>
<td>Lab 2</td>
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<tr>
<td>8</td>
<td>Mar 4</td>
<td>Operational Amplifier Circuits</td>
<td>13</td>
<td>Lab 4</td>
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<tr>
<td>9</td>
<td>Mar 11</td>
<td>Spring Break</td>
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<tr>
<td>10</td>
<td>Mar 18</td>
<td>Operational Amplifier Circuits</td>
<td>13</td>
<td>Lab 5</td>
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<tr>
<td>11</td>
<td>Mar 25</td>
<td>Filters</td>
<td>14</td>
<td>Lab 6</td>
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<tr>
<td>12</td>
<td>Apr 1</td>
<td>Filters</td>
<td>14</td>
<td></td>
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<td>13</td>
<td>Apr 8</td>
<td>Oscillators</td>
<td>15</td>
<td>Lab 7</td>
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<tr>
<td>14</td>
<td>Apr 15</td>
<td>Oscillators</td>
<td>15</td>
<td></td>
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<tr>
<td>15</td>
<td>Apr 22</td>
<td>CMOS Digital Logic Circuits</td>
<td>16</td>
<td>Lab 8</td>
</tr>
<tr>
<td>16</td>
<td>Apr 29</td>
<td>CMOS Digital Logic Circuits</td>
<td>16</td>
<td></td>
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<tr>
<td>17</td>
<td>May 6</td>
<td>Final</td>
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Grading Policy:

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<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Laboratory</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
<td>Lab Procedures</td>
</tr>
<tr>
<td>Attendance</td>
<td>5%</td>
<td>Lab Reports</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
<td>Attendance</td>
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Credit Hour Justification
Meets 3 hrs/wk for 15 weeks, and also meets for a 2-hour final examination. This is a problem oriented class with homework problems. The lecture total 2.5 hours of contact time each week and the work outside of classes each week averages much more than 5 hours in working homework problems, preparing and answering online quizzes, reading the book to understand the theories used in lecture and in homework problems and exams, working on projects, writing formal project reports, and studying for exams which include major exams and possibly short lecture quizzes.

Asynchronous Content
This course is following the flipped classroom methodology. This requires the students to cover the theory and concepts outside the classroom. Every week, the students will have to read and watch videos related to course material that will be covered the following week. It is crucial that you keep up with materials to get the best results from the face-to-face lecture time.

Lecture Remote Delivery
In case of quarantine or if you cannot attend the lecture for some important reason, please let me know so I can stream the class using zoom. This same method will be used in case I am not able to get on campus. The zoom link will be posted in D2L.

Student Learning Outcomes
By the end of the course, a successful student will be able to:

1. Analyze the frequency response of MOSFET and BJT amplifiers. (SO – 1)
2. Analyze the effects of negative feedback in amplifiers. (SO – 1)
3. Describe the building blocks of IC amplifiers. (SO – 1)
4. Analyze differential and multistage amplifiers. (SO – 1)
5. Analyze operational amplifiers. (SO – 1)
6. Characterize active filters. (SO – 1)
7. Analyze and design oscillator circuits. (SO – 1)
8. Analyze CMOS digital logic circuits. (SO – 1)
9. Examine amplifier circuits using laboratory equipment. (SO – 6)
10. Demonstrate negative feedback on amp. circuits using laboratory equipment. (SO – 6)
11. Write laboratory reports to present results from laboratory data. (SO – 3)
12. Collaborate with other students to collect and present laboratory data. (SO – 5)
13. Research VLSI fabrication technology. (SO – 7)
14. Discuss the implications of IC manufacturing in our world. (SO – 4)

Program Learning Outcomes
Graduates of the program will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. 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. an ability to communicate effectively with a range of audiences
4. 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 social contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

General Education Core Curriculum Objectives/Outcomes (EEO)
There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.

Academic Integrity (4.1)
Academic integrity is the responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways, including instruction on the components of academic honesty and abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are: (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/student-academic-dishonesty-4.1.pdf.

Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the coursework because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course to compute the grade point average. For additional information, go to https://www.sfasu.edu/policies/course-grades-5.5.pdf.

Students with Disabilities
To obtain disability-related accommodations, alternate formats, and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004(TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services promptly may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Student Wellness and Well-Being
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc. If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
The Dean of Students Office (Rusk Building, 3rd floor lobby) [www.sfasu.edu/deanofstudents](http://www.sfasu.edu/deanofstudents)  
936.468.7249 dos@sfasu.edu

**SFASU Human Services Counseling Clinic**  
Human Services, Room 202 [www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp) 936.468.1041

**The Health and Wellness Hub**
“The Hub” Location: corner of E. College and Raguet St. To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services  
- Counseling Services  
- Student Outreach and Support  
- Food Pantry  
- Wellness Coaching  
- Alcohol and Other Drug Education

[www.sfasu.edu/thehub](http://www.sfasu.edu/thehub)  
936.468.4008 thehub@sfasu.edu

**Crisis Resources:**
Burke 24-hour crisis line: 1.800.392.8343  • National Suicide Crisis Prevention: 9-8-8  • Suicide Prevention Lifeline: 1.800.273.TALK (8255)  • johCrisis Text Line: Text HELLO to 741-741