Sonoma State University Engineering Science Course Syllabus – Spring 2016

Course: ES 230  Electronics I (3.0 LEC units)

SALZ2001  5:25 PM to 6:40 PM T & Th

Course Description:

Theory, characteristics, and operation of diodes, bipolar junction transistors, and MOSFET transistors; analog and digital electronic circuits; design and analysis of analog electronic circuits such as filters, operational amplifiers, and single and multistage amplifiers; modeling and simulation using software. Prerequisites: ES 220 and 221 or consent of Instructor.

Final exam: Tuesday May 17, 5:00-6:50PM

Instructor: Derek Decker

Office hours: Posted at 2010D or by appointment

Phone: (707) 664-4385

Office location: Salazar Hall, Room 2010D

E-Mail: derek.decker@sonoma.edu

Please make sure you speak to me before you decide on dropping the class!


Tentative Outline of Course: Chapters 1-7 (~500 pages)

Feb: Chapters 1 and 2: Op Amps, signal, and amplifiers

March: Chapters 3 and 4: Semiconductors and diodes

April: Chapters 5 and 6: MOSFETs and BJTs

May: Chapter 7: Transistor amplifiers

Grading Policy: Please check Moodle for grading information
Course Outcomes (COs):
1. Know how to recognize, debug, design, and use simple circuits containing diodes, op amps and transistors.
2. Know how to design build and test an amplifier with op amps and with transistors.
3. Understand the importance of high input impedance and low output impedance in amplifiers.
4. Understand some of the physics which leads to I-V characteristics of diodes, BJTs and MOSFETs.

Course Learning Objectives (CLOs):
A. Students get the ability to analyze and design circuits using operational amplifiers, diodes, MOS transistors, bipolar junction transistors (BJTs).
B. Students will use simulation software for better understanding electricity and electronics.
C. Students learn about single and multistage amplifiers.

Student Learning Outcomes vs. Course Learning Objectives: (Support Level (0-5) 0=No support, 1=lowest support, 5=highest support)

<table>
<thead>
<tr>
<th>ABET Student Outcomes</th>
<th>Course Learning Objectives</th>
<th>Level of Support</th>
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<tbody>
<tr>
<td>(a) an ability to apply knowledge of mathematics, science, and engineering</td>
<td>A, B</td>
<td>3</td>
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<tr>
<td>(b) an ability to design and conduct experiments, as well as to analyze and interpret data</td>
<td>A, C</td>
<td>3</td>
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<tr>
<td>(c) an ability to design a system, component, or process to meet desired needs</td>
<td>C</td>
<td>4</td>
</tr>
<tr>
<td>(d) an ability to function on multi-disciplinary teams</td>
<td></td>
<td>0</td>
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<tr>
<td>(e) an ability to identify, formulate, and solve engineering problems</td>
<td>A-C</td>
<td>1</td>
</tr>
<tr>
<td>(f) an understanding of professional and ethical responsibility</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>(g) an ability to communicate effectively</td>
<td></td>
<td>0</td>
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<tr>
<td>(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context</td>
<td></td>
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<tr>
<td>(i) a recognition of the need for, and an ability to engage in life-long learning</td>
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<td>0</td>
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<tr>
<td>(j) a knowledge of contemporary issues</td>
<td></td>
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<tr>
<td>(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</td>
<td>A-C</td>
<td>2</td>
</tr>
<tr>
<td>(l) one or more technical specialties that meet the electronic-related needs of North Bay companies</td>
<td></td>
<td>0</td>
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Assessment Methods: Assessment of the student learning
1. Student lab reports
2. Quizzes, Midterm, and Final

Course Quality Assessment
1. Student survey of the course
2. Peer instructors feedback
Be advised: The California Faculty Association is in the midst of a difficult contract dispute with management. It is possible that the faculty union will call a strike or other work stoppage this term. I will inform the class as soon as possible of any disruption to our class meeting schedule.

CONDUCT: In order to create an appropriate environment for teaching and learning, students must show respect for their instructor and fellow students. Listed below are a few guidelines for classroom behavior. Students are expected to follow these rules to ensure that the learning environment is not compromised.

1. Class Participation: You are expected to be in class the entire class time. Please do not enter late or leave early. Rare exceptions may be made, particularly in emergency situations. Your participation in the class and lab and the discussions are very important and would help me understand how much you follow the material. As you go through the material before and after the class jot down your questions and ask me as I go through the material.

2. Absences: Inform the instructor in advance, if you know you are going to miss a lab. Also, take responsibility for setting up a time with me for you to complete work you missed. Your instructor is not responsible for re-teaching the material you missed due to an absence or being late so it would be to your advantage to find out what you missed from other students.

3. Conversation: Do not have side conversations in class. Stay focused on finishing the lab in as short a time as is practical. Don’t carry on conversations with people outside the class (ie. No texting, phone, or email with others). Check your texts and emails before coming to class!

4. Do not sleep or daydream. Stay focused on learning and completing the tasks at hand.

5. No Internet browsing: Listen for instructions, information, lectures, and advice at all times in the lab. Avoid all other distractions.

6. Attitude: You are expected to maintain a civil attitude in class. You may not use inappropriate or offensive commentary or body language toward the instructor or fellow students.

7. Cell phones: You may not use your cell phone during class. Please turn off your cell phone upon entering the classroom.

Academic Honesty: You are responsible to behave ethically and honestly. Copying, cheating, forgery and other unethical or dishonest actions are not tolerated. In such case, the person will receive zero grade and can be reported to SSU authorities. SSU Policy on Cheating and Plagiarism
For more information on SSU's important policies and procedures go to: Important Policies and Procedures for Students

Withdrawal: No student will be granted a withdrawal after the deadline except under extreme circumstances. Policy regarding withdrawal is stated in the university catalog. SPECIAL NEEDS: Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs.

Study Guidelines: In order to get the most out of this course, always try to stay ahead. Make sure you have reviewed the material in advance so the next lectures will be much more informative and meaningful.