INTRODUCTION TO EE 115A

OUTLINE

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  Professor W. J. Kaiser ........................................................................................................ 1
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COURSE INFORMATION

INSTRUCTOR

PROFESSOR W. J. KAISER

Background:
  - Ford, Jet Propulsion Laboratory, UCLA - 1994 – to present.
  - Department Chairman 1996-2000
  - Research Programs with UCLA Undergraduate and Graduate Students: Networked Embedded Systems, Robotic Wireless Sensors, Low Power Electronics, Technology for Education

CONTACT INFORMATION
  Office: 56-147L Engineering IV
  Cell Phone: 310-922-4460 (anytime)
  E-mail (preferred): kaiser@ee.ucla.edu (anytime)
  Web: www.ee.ucla.edu/faculty/bios/kaiser.htm
  Office Phone 310-206-3236 (please use e-mail (preferably) or cell phone)

OFFICE HOURS
  3:00 – 6:00 Monday and Wednesday (and to be arranged)
COURSE INFORMATION

COMMIMITMENTS:

1. Instructor and Teaching Assistants
   a. Presentation
   b. Answering questions
   c. Assistance with homework
   d. Office hour support
   e. Support for PSpice
   f. General discussions

2. Students:
   1. **Attendance at lectures and recitations**
   2. Questions: In class, after class, office hours, and e-mail
   3. Feedback to instructor on any interests, concerns, requests, need for help
   4. Effort in reviewing lectures, solving homework problems, studying for exams

LECTURE NOTES:

1. **Available at eeweb Course Web Site prior to each lecture**

COURSE WEB SITE:

http://www.eeweb.ee.ucla.edu/classinfo.php?/ee115A/1/spring/4

Contact Information, Syllabus, Schedule

- Lecture Notes available on Web before class (Adobe Acrobat format).
- Homework Hints
- **Please check Web site for updates**

- PLEASE DOWNLOAD AND PRINT LECTURE NOTES BEFORE CLASS. BRING HARDCOPY TO CLASS. NOTE TAKING IS ALSO VERY IMPORTANT.
- In-Class combination of viewing notes electronically and viewing chalkboard
- PSPice Tutorials

EXAMS:

1. **Plan for Review Sessions**
2. Test knowledge and skills gained in lecture, recitations, and through homework
3. Exam problems are often derived directly from lecture and homework example problems
4. One page of notes, 8-1/2” x 11” both sides may be brought to exam.
HOMEWORK PROCEDURES:

1. Homework due before start of class session
2. PSpice problems may be completed with either 9.1 or 9.2 version of Orcad PSpice
3. PSpice 9.2 is strongly recommended. PSpice 9.2 CDs may be borrowed
4. A PSpice Tutorial is available on the Web site

GRADING PLAN:

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<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm</td>
<td>30%</td>
</tr>
<tr>
<td>Final</td>
<td>40%</td>
</tr>
<tr>
<td>Homework</td>
<td>25%</td>
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<tr>
<td>PSpice Problems</td>
<td>5%</td>
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1. Material brought to exams may include one 81/2” x 11” sheet with notes, both sides.
2. Bring Engineering and Science exam books to Midterm and Final

TEXTBOOK:

Microelectronic Circuits by Sedra and Smith

PSPIRE TOOLS:

- Orcad PSpice Version 9.2 available now on all SEASnet PCs.
- PSpice 9.1 and 9.2 CD included in Introduction to PSpice for Electric Circuits textbook
- Instructor can lend PSpice 9.2 CDs.
- PSpice tutorials are available on the EE115A Class Web Site.
### SCHEDULE

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<tr>
<th>Week</th>
<th>Topics</th>
<th>Chapters</th>
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| 1    | Introduction to Electrical Engineering 115A  
Analog Signal, Analog Signal Processing, and Analog Circuits  
Signals, Transducers, and Amplifiers  
Amplifier Circuit Models  
Amplifier Frequency Response  
Non-Linear Devices: Introduction  
Diode Models  
   - Ideal Diode  
   - Semiconductor Diodes | 1.1 – 1.6 Review Appendix E |
| 2    | Diode Reverse Characteristics  
Diode Small Signal Model  
Semiconductor P-N Junction Devices  
Diode Circuits  
Diode Limiter Circuits | 3.1 - 3.6 |
| 3    | Bipolar Junction Transistor  
   - Structure and Operation  
   - Applications  
DC Characteristics  
BJT Transistor Amplifier Small Signal Circuits  
BJT Transistor Amplifier Bias Methods | 4.1 – 4.10 |
| 4    | The Single BJT Transistor Amplifiers: Design and Analysis  
   - Common Emitter Amplifier  
   - Common Base Amplifier  
   - Common Collector Amplifier  
BJT Transistor Switching Applications | 4.10-4.12 |
| 5    | Metal Oxide Semiconductor Field Effect Transistor (MOSFET)  
   - Structure, Operation, and Applications  
MOSFET DC Characteristics  
Midterm Review | 5.1 – 5.4 |
| 6 | Midterm  
|   | MOSFET Amplifier  
|   | Small Signal Circuits  
|   | MOSFET Biasing  
| 5.1 – 5.6 |
| 7 | MOSFET Current Sources  
|   | The MOSFET Single Transistor Amplifiers: Design and Analysis  
|   | Common Source Amplifier  
|   | Common Gate Amplifier  
| 5.7 |
| 8 | Common Drain (Source Follower) Amplifier  
|   | MOSFET Cascode Amplifier  
| 5.8-5.10 |
| 9 | CMOS Technology and Amplifiers  
|   | CMOS Logic Circuits  
| 2.1-2.6 |
| 10 | Operational Amplifiers: Non-Ideal Response  
|   | Operational Amplifiers: Frequency Response  
|   | Final Review  
|   | Final Review  
| 2.7-2.9 |