Syllabus for EEE 3308C - Electronic Circuits 1

1. Catalog Description

2. Pre-requisites
   EEL 3111C.

3. Course Objectives
   Learn the basics of electronic components, circuits, and systems. Design electronic circuits and systems to meet desired needs and specifications. Engage in life-long learning of electronics and related technologies.

4. Contribution of course to meeting ABET professional component
   - One semester of a combination of college level mathematics (e.g., complex algebra, differential equation) and basic sciences (e.g., semiconductor device operation) with experimental experience
   - One semester of engineering topics (e.g., the designs of voltage regulators and amplifiers)
   - Engage in life-long learning (discussing latest developments in electronic technologies via class www site)

5. Relationship of course to ABET program outcomes
   - Knowledge of probability and statistics, including applications (parameter extraction for semiconductor devices)
   - Knowledge of mathematics, basic and engineering sciences necessary to analyze and design complex systems (tests and design projects)
   - An ability to apply knowledge of mathematics, science, and engineering (design projects)
   - An ability to design and conduct experiments, as well as to analyze and interpret data (design projects)
   - An ability to design a system, component, or process to meet desired needs (design projects)
   - An ability to identify, formulate, and solve engineering problems (design projects)
   - An ability to communicate effectively (class discussions)
   - A recognition of the need for, and an ability to engage in life-long learning (class www site includes links to new technologies)
   - An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (circuit simulators; spreadsheets; National Instruments ELVIS; Digilent Analog Discovery Board)
6. Instructor: Dr. Yong-Kyu “YK” Yoon
   a. Office location: Larsen 225
   b. Office hours: @ Larsen 225 or larger room (if necessary)
      Tue & Wed (1:00pm – 1:50pm)
   c. Telephone: 352-392-5985
   d. E-mail addresses: ykyoon@ece.ufl.edu, ykyoon@gmail.com
   e. Web site: http://lss.at.ufl.edu/ (Click on “Canvas system entry” button)

7. Teaching Assistants:
   Victor Farm-guoo Tseng (souldragon227@ufl.edu)
   Riley J. Duffy (rduffy@ufl.edu)
   a. Office location (in E-circuits lab): NEB 213B
   b. Lab/TA hours: See Lab/Lecture schedule document
   c. The TAs will assist with grading; operating the labs, and helping students with computer simulation and electronic circuit experiments.

8. Meeting Times
   Lecture: T 2nd-3rd period (8:30-9:20am, 9:35am-10:25am)
   R 3rd period (9:35-10:25am)
   Lab/TA hours: See Lab/Lecture schedule document

9. Meeting Location
   NEB 202

10. Material and Supply Fees
    The Digilent Analog Discovery (DAD) board is required for this course (and many other ECE courses). Board ordering information can be found at this link:
    http://tinyurl.com/discov-ufl
    http://www.digilentinc.com/Products/Detail.cfm?Prod=ANALOG-DISCOVERY
    Also, Electric Components need to be purchased ($43.06)

11. Textbooks and Software Required
    a. Title: Microelectronic Circuits
    b. Author: A.S. Sedra & K.C. Smith
    d. ISBN number: 978-0-19-933913-6
    e. LTSPICE IV: Available for free at http://www.linear.com/designtools/software/
    f. MathCAD: Available at ECE Remote Access

12. Recommended Reading
    See below.

13. Course Outline (provide topics covered by week or by class period)
    These may be adjusted as the course proceeds. See weekly calendar on the website for details.

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### Tentative Schedule

<table>
<thead>
<tr>
<th>Topic</th>
<th>Chapter</th>
<th>Periods (Approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Introduction</td>
<td>1.1-6</td>
<td>1</td>
</tr>
<tr>
<td>Operational Amplifiers - Analysis</td>
<td>2.1-3</td>
<td>1</td>
</tr>
<tr>
<td>Operational Amplifiers - Circuits</td>
<td>2.4-5</td>
<td>2</td>
</tr>
<tr>
<td>Operational Amplifiers – Non-ideal</td>
<td>2.6-8</td>
<td>3</td>
</tr>
<tr>
<td>Diode - PN junction operation</td>
<td>4.1, 2, 4, 7</td>
<td>1</td>
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<tr>
<td>Diode - Model Diode - Circuits</td>
<td>4.3-4</td>
<td>1</td>
</tr>
<tr>
<td>Diode - Model Diode - Circuits</td>
<td>4.5-6</td>
<td>3</td>
</tr>
<tr>
<td>FET - Operation; DC models</td>
<td>5.1-4</td>
<td>1</td>
</tr>
<tr>
<td>FET - Biasing FET – Amplifiers</td>
<td>7.1-2</td>
<td>2</td>
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<tr>
<td>FET – AC model FET – Amplifiers; SPICE</td>
<td>7.3</td>
<td>1</td>
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<tr>
<td>FET – AC model FET – Amplifiers; SPICE</td>
<td>7.4-5</td>
<td>3</td>
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<tr>
<td>BJT - Operation; DC models</td>
<td>6.1-2, 4</td>
<td>1</td>
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<tr>
<td>BJT - Biasing BJT - Ampliers; SPICE</td>
<td>7.1-2</td>
<td>2</td>
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<tr>
<td>BJT – AC model BJT - Amplifiers; SPICE</td>
<td>7.3</td>
<td>1</td>
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<tr>
<td>BJT – AC model BJT - Amplifiers; SPICE</td>
<td>7.4-5</td>
<td>3</td>
</tr>
<tr>
<td>IC Biasing - Current sources, mirrors,</td>
<td>8.2</td>
<td>1</td>
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<tr>
<td>steering IC Single-Stage Amplifiers; Active</td>
<td>8.3-4</td>
<td>4</td>
</tr>
<tr>
<td>loads IC Cascade Amplifiers; SPICE</td>
<td>8.5-6</td>
<td>3</td>
</tr>
<tr>
<td>Differential Amplifiers - Diff Amp with Active Load,</td>
<td>9.1-3</td>
<td>3</td>
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<tr>
<td>Diff Amp Frequency Response, Multistage</td>
<td>9.4-6</td>
<td>2</td>
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<tr>
<td>Amplifiers; SPICE</td>
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<td>3</td>
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<tr>
<td>Operational-Amplifier Circuits</td>
<td>13.1-3</td>
<td>2</td>
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<tr>
<td>Exams and Quizzes</td>
<td>2.5 and 0.25</td>
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### 14. Lab schedule

<table>
<thead>
<tr>
<th>Topic</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Charge and Supply (ELVIS and DAD usage)</td>
<td>W2-3</td>
</tr>
<tr>
<td>Wireless Power Transfer (WPT)</td>
<td>W4-5</td>
</tr>
<tr>
<td>Baxandall Circuit for Audio Control</td>
<td>W6-7</td>
</tr>
<tr>
<td>Interfacing Electronics to Power Circuits</td>
<td>W8-9</td>
</tr>
<tr>
<td>Transistor AM Radio Receiver</td>
<td>W10-11</td>
</tr>
<tr>
<td>Multistage Amplifier</td>
<td>W12-13</td>
</tr>
</tbody>
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### 15. Attendance and Expectations

a. Attendance motivated by weekly quiz
b. Etiquettes: It is understood that attendees at lectures and labs will be focused on the particular lecture or lab and will take every possible measure to minimize

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distractions for everyone (i.e. no newspapers, no cell phones, no PDAs, no iPods, no laptops, etc. unless instructed to use them for class, no newspapers, on-time attendance, and no early departures (unless noted and approved in advance)).

16. Grading – methods of evaluation
   a. Homework: 5% (Weekly)
   b. Quizzes: 20% (Weekly), Every Tuesday
   c. Design and Experiment Project (DEP) labs 25% (Weekly)
      [Breakdown: 15% for prelab & design; 10% for timeliness; 15% for notebook reviewed and signed; 10% for lab conduct and cleanup; 50% for lab report]
   d. Midterm: 25% (One handwritten info sheet allowed)
   e. Final: 25% (Two handwritten info sheets allowed)

17. Grading Scale
   Grading Scale: ≥93 A; ≥90 A-; ≥87 B+; ≥83 B; ≥80 B-; ≥77 C+; ≥73 C; ≥70 C-; ≥67 D+; ≥63 D; ≥60 D-; <60 E

18. Make-up Exam Policy
   a. There are no makeup quizzes or exams. With appropriate justifications & legal documents (UF Dean of Students, certified physician, military active duty, Judge for jury duty), up to 20% of the assignments can be dropped and the remaining scores averaged.
   b. For labs, an approved lab makeup must be done within one week of the lab unless written documentation from the approved sources listed above or justified otherwise.

19. Honesty Policy
   All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities
   Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services
   Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
   - University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
   - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
   - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.

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- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

22. **Software Use**

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.