Practical Electronics and Circuits for Mechanical Engineers (MEC220)
Stony Brook University

Course Objectives:
In the course students will learn the basic electronics and circuits for mechanical engineering applications, including analysis methods for DC and AC electrical circuits, electrical power, diodes and transistors, magnetic fields, and AC/DC machines. The course is composed of two weekly lectures, one tutorial, and two take-home labs and one in-house lab.

The topics include:
1. Resistive circuit analysis: Ohms law, Kirchhoff's laws, nodal analysis; Thevenin's theorem;
2. Operational amplifiers;
3. Capacitors and inductors;
4. Time response of first order circuit;
5. Introduction to AC circuit analysis
6. Diodes and transistors, AC to DC;
7. Motors, generators, and electric driver;
8. Introduction to piezoelectric accelerometer and signal conditioning circuit.

Instructors: Prof Lei Zuo

Teaching Assistant: Yilun Liu (PhD student, shjiaoda@ufl.edu, in HE 211);
Grader: Chao Nie (MS student, potato.503208@gmail.com, in HE 211)

Textbook and Reference:

Grading Policy

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Quiz and final</td>
<td>25%+25%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>10%</td>
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<tr>
<td>Attendance and participation</td>
<td>10%</td>
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Lectures: Wed and Fri 9:00AM - 9:55AM, at JAVITS LECTR 102
Tutorial: Mon 9:00AM - 9:55AM, at JAVITS LECTR 102
Office Hours:
Prof Lei Zuo Wed 10:00 am-12:15pm
TA’s hours (Tentative) Tuesday 4:30-6pm (tentative)
Some Notes:

1. 8th week, **Mid-term/Quiz**, Wed or Fri (Oct 17 or 19)
2. 10th week, In house lab in Room Heavy Engineering 139, on Op-Amp
3. 16th week, **Final exam**
4. Two lectures and one tutorial each week
5. Homework: every two lectures (almost every week except Quiz/exam)
6. **Competency questions** will be included in exams, and you must pass to get a non-F grade.

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**Academic Integrity Statement:**

Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, **but are not limited to**, copying or plagiarizing class assignments including homework, reports, designs, computer programs, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn.

**Calculator Policy:**

Effective spring, 2008 only the following calculators will be permitted to be used on all midterm and final exams in the Department of Mechanical Engineering. There will be no exceptions! This list of calculators is identical to that allowed for the **National Council for Examiners for Engineering and Surveying** (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better.

NCEES Allowed calculators as of spring, 2008:

- Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name
- Hewlett Packard: The HP 33s and HP 35s models, but no others.
- Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name

The NCEES policy on calculators can be found here: [http://www.ncees.org/exams/calculators](http://www.ncees.org/exams/calculators)