Course Syllabus

ELCT 201 – Introductory Electrical Engineering Laboratory

Course Coordinator: Undergraduate Program Committee

Catalog Description: Laboratory procedures, instrumentation and measurements, report writing, computer use, passive circuit analysis and design.

Credit Hours 3

Prerequisite(s) by course CSCE 211, ELCT102 Pre or Coreq: ELCT222

Prerequisite by topics Electrical Charges & Forces, Current & Voltage, Ohm’s Law, Circuits, Calculus, Number Systems, Algebra, Logic Design


Course Outcomes:
Students who are successful in this class (i.e. earn C or better) will demonstrate at least the abilities to:

- Select and use the proper laboratory instrument.
- Build, test and debug circuits using soldered and solderless proto-boards.
- Communicate the results of lab experiments in formal lab reports, with emphasis on proper structure and formatting, and multimedia presentations.
- Use the theory learned in ELCT 222 to design, build and measure active filter.
- Design and present team oriented challenge projects.

Students who demonstrate higher proficiency will earn higher grades.

Course Topics:
- Use of lab equipment: multimeters, oscilloscopes, function generators, power supplies, current probes.
- Construction and debugging of electronic circuits, soldering, proto-boards.
- Practical characteristics of passive components: resistors, capacitors, inductors.
- Practical characteristics of active components: diodes, transistors, optoelectronics
- Use of electromechanical actuators (DC Motors)
- Introduction of electromechanical systems with feedback
- Standard lab Report format and recommended presentation format
- Basic electric lab safety rules: safety glasses, soldering, voltage insulation, electrolytic capacitors.
- Lab projects: Building DC Power Supply, second-order Butterworth active filter, analog and digital feedback for position control
- Team oriented challenge project

Course Contribution to Program Outcomes:
ELCT 201 contributes to an achievement of:

- Outcome A – an ability to apply knowledge of mathematics, science and engineering
- Outcome B – an ability to design and conduct experiments, as well as analyze and interpret data
- Outcome D – an ability to function on multi-disciplinary teams
- Outcome E – an ability to identify, formulate, and solve engineering problems
- Outcome G – an ability to communicate effectively
- Outcome K – an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
General Course Policies

Academic Integrity
Unless otherwise stated, assignments and examination work are expected to be the sole effort of the student submitting the work. Students are expected to follow the University of South Carolina Honor Code and they should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied.

Accommodating Disabilities
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity
When scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Recommended Study Habits
- Read the assigned material before class.
- Bring thoughtful questions to class for discussion.
- Prepare for the exams in study groups.
- Take notes during class discussions and while completing reading assignments.

Deviations
Minor deviations from the syllabus are a normal part of any adaptive teaching and learning process.
Instructor’s Addendum for Fall 2015

Instructor: Dr. Charles Brice, email: brice@cec.sc.edu
Lab Instructor: Mr. David Metts, 2D20, email: mettsd@engr.sc.edu

Office: Swearingen 3A22
E-mail: brice@cec.sc.edu

Class Location: Swearingen 2A15 & 2D36

Course Delivery Structure:
Lectures/laboratory

Course Assessment
Course assignments include lab reports and group presentation.

Approximate grading scheme is as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Average of 5 Formal Lab Reports</td>
<td>25%</td>
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<tr>
<td>Design Group Lab PPT</td>
<td>10%</td>
</tr>
<tr>
<td>Average of 2 Regular Written tests</td>
<td>20%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Mid Term Lab Practical</td>
<td>15%</td>
</tr>
<tr>
<td>Final Project (10% Demo; 10% PPT)</td>
<td>20%</td>
</tr>
</tbody>
</table>

Grading Scale:

- A = 90-100
- B+ = 85-89
- B = 80-84
- C+ = 75-79
- C = 70-74
- D+ = 65-69
- D = 60-64
- F = less than 60

Course Outline/Schedule
Topics for each class meeting are listed below. However, circumstances may call for a departure from this schedule. Any changes to the schedule will be made in advance. Homework assignments will be handed out at least one week prior to the due date.

<table>
<thead>
<tr>
<th>Course Schedule</th>
<th>Time</th>
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<tbody>
<tr>
<td>Safety and intro, use and practice activities for lab equipment</td>
<td>week 1</td>
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<tr>
<td>Building 12Volt DC power supply and testing</td>
<td>week 2</td>
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<tr>
<td>Building 12Volt DC power supply, testing and reporting</td>
<td>week 3</td>
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<tr>
<td>Second – Order Butterworth Filter Lab and Bode Plot, (Power Supply Lab #1 Report due)</td>
<td>week 4</td>
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<tr>
<td>The LDR, level detector, latch, driver and relay Lab (“Divide and Conquer Lab”), return Lab #1 report</td>
<td>week 5</td>
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</tbody>
</table>

Office: Swearingen 3A22
Phone: 803.777.7049
Office hours: by appointment
Class Meeting Time:
Lecture: Mon 2:20 – 4:20 PM
Lab section 1: Tue 3:30 – 6:30 PM
Lab section 2: Thu 3:30 – 6:30 PM

Instructor:
Dr. Charles Brice, email: brice@cec.sc.edu

Lab Instructor:
Mr. David Metts, 2D20, email: mettsd@engr.sc.edu

Office:
Swearingen 3A22
Phone: 803.777.7049
Office hours: by appointment

Teaching Assistant:
Tuesday section: Albert Smith: SMITHAE9@email.sc.edu
Thursday section: Paul Czeresko: CZERESKO@email.sc.edu

Class Location:
Swearingen 2A15 & 2D36

Class Meeting Time:
Lecture: Mon 2:20 – 4:20 PM
Lab section 1: Tue 3:30 – 6:30 PM
Lab section 2: Thu 3:30 – 6:30 PM

Average of 5 Formal Lab Reports 25%
Design Group Lab PPT 10%
Average of 2 Regular Written tests 20%
Quizzes 10%
Mid Term Lab Practical 15%
Final Project (10% Demo; 10% PPT) 20%
## Course Schedule

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<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Group redesign project of “Divide and Conquer Lab”, (Filter Lab #2 report due)</td>
<td>week 6</td>
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<tr>
<td>Group redesign presentations, (Redesign Lab #3 report due), Lab practical practice, return Lab #2</td>
<td>week 7</td>
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<tr>
<td>Lab Practical Exam and return Lab #3</td>
<td>week 8</td>
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<tr>
<td>Regular written Test #1........Fall Break</td>
<td>week 9</td>
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<td>Analog ON/OFF controller with feedback</td>
<td>week 10</td>
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<tr>
<td>Convert Analog ON/OFF controller to digital ON/OFF controller (Analog ON/OFF Lab #4 report due)</td>
<td>week 11</td>
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<tr>
<td>End of semester group projects (Conversion to Digital ON/OFF Lab #5 report due), return Lab #4</td>
<td>week 12</td>
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<tr>
<td>End of semester group projects, return Lab #5</td>
<td>week 13</td>
</tr>
<tr>
<td>Regular written Test #2........Thanksgiving Break</td>
<td>week 14</td>
</tr>
<tr>
<td>End of semester project presentations</td>
<td>week 15</td>
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<tr>
<td>Final Exams</td>
<td>week 16</td>
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## Instructor Policies

### Attendance Policy
Students are expected to attend each scheduled class meeting, to be on time, and to be prepared for each class session. Class absences will affect your class participation grade. Quizzes, homework, and participation points cannot be made up except in the case of extreme illness or loss.

### Expectations for Classroom Behavior
Please be respectful of each other, the instructor, and any guest presenters while in class. We are all here to learn! Any disrespectful or disruptive behavior may result in your referral to the Office of Student Judicial Programs.

### Assignment Submission
Assignments are always due before class starts on the day noted. Late assignments will be accepted only in cases of emergency.

### Midterm and Final Exams
Makeup exams will be allowed only with pre-approval of the instructor or with an acceptable, documented reason. Acceptable reasons for makeup exams include severe illness, family emergencies or other unavoidable events including dangerous weather conditions and car accidents. Exam format for makeup exams may be different than the original exam.

### Expectations of the Instructor
I understand that students expect me to facilitate their learning, to answer their questions appropriately, to be fair and objective in grading, to provide timely and useful feedback on assignments, to maintain adequate office hours, and to treat them as I would like to be treated in their place.