Course Syllabus

ELCT 301 – Electronics Laboratory

Course Coordinator: Undergraduate Program Committee
Catalog Description: Design and implementation of analog and digital electronic circuits, with emphasis on developing deep individual understanding of curriculum-spanning concepts
Credit Hours: 3
Prerequisite(s) by course: D or better grade in ELCT 201; Pre or Coreq: ELCT 371
Prerequisite by topics: Electronics, Use of Oscilloscopes, Circuits, Time and Frequency Domain Analysis of Linear Systems
Other Materials:
  • Laboratory Notebook with permanently bound pages. Circuit prototyping (plug-in) board, wire cutters, wire strippers, small screwdriver, needle nose pliers.
  • Class assignments and other material posted on Blackboard

Learning Outcomes:
Students who successfully complete the course will be able to:

1. functionally test and debug electronic circuits
2. use SPICE to simulate electronic circuits
3. analyze and experimentally characterize electric circuits in the frequency domain
4. communicate effectively through written lab reports and technical memos, with emphasis on critical discussion of results

Course Topics:
• Active components under small-signal and large-signal (non-linear) operation
• Timing and pulse circuits
• Op-amp characteristics and limitations
• Active filter design
• Wave shaping and generation
• Transistor behavior
• Audio amplifier
• Design of magnetic core inductor
• DC-DC switching power converter
• SPICE simulation of electronic circuits
• Populating a printed circuit board from a circuit schematic

Course Contribution to Program Outcomes:
ELCT 301 contributes to an achievement of:
• Outcome 1 – an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

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• Outcome 2 – an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. (Outcome K)
• Outcome 3 -- an ability to communicate effectively with a range of audiences
• Outcome 6 -- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusion.

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
• Prepare for the lab sessions by performing the required work and computer simulations.
• 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.