1. **COURSE ID:** ENGR 260  
   **TITLE:** Circuits and Devices  
   **Units:** 4.0 units  
   **Hours/Semester:** 48.0-54.0 Lecture hours; and 48.0-54.0 Lab hours  
   **Method of Grading:** Letter Grade Only  
   **Prerequisite:** PHYS 260  
   **Recommended Preparation:** completion of or concurrent enrollment in MATH 275

2. **COURSE DESIGNATION:**  
   **Degree Credit**  
   **Transfer credit:** CSU; UC

3. **COURSE DESCRIPTIONS:**  
   **Catalog Description:**  
   Introduction to circuits. Natural and forced response, network theorems, characteristics and circuit models of electronic devices including transistors and diodes. Laboratory assignments include both hardware techniques and computer-aided analysis. (Spring only)

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**  
   Upon successful completion of this course, a student will meet the following outcomes:  
   1. Analyze first and second order RLC circuits for natural and forced response.  
   2. Use Thevenin and Norton equivalent circuits to assist in analysis and design.  
   3. Analyze circuits containing solid state devices, including diodes, transistors, and operational amplifiers.  
   4. Analyze basic digital circuits.  
   5. Use standard lab equipment and techniques to build and test analog and digital circuits.  
   6. Use standard software to simulate and test analog and digital circuits.  
   7. Design analog and digital circuits to meet specific performance objectives.  
   8. Record and document the results of laboratory work using appropriate text and graphs.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**  
   Upon successful completion of this course, a student will be able to:  
   1. Analyze first and second order RLC circuits for natural and forced response.  
   2. Use Thevenin and Norton equivalent circuits to assist in analysis and design.  
   3. Analyze circuits containing solid state devices, including diodes, transistors, and operational amplifiers.  
   4. Analyze basic digital circuits.  
   5. Use standard lab equipment and techniques to build and test analog and digital circuits.  
   6. Use standard software to simulate and test analog and digital circuits.  
   7. Design analog and digital circuits to meet specific performance objectives.  
   8. Record and document the results of laboratory work using appropriate text and graphs.

6. **COURSE CONTENT:**  
   **Lecture Content:**  
   1. Review of circuit elements, Ohm's law, KVL, KCL, voltage and current dividers  
   2. Analysis of circuits using nodal and loop methods and Thevenin and Norton equivalents  
   3. Superposition  
   4. Steady state dc analysis  
   5. Transient analysis of RL, RC circuits  
   6. Transient and steady state analysis of second order circuits  
   7. Phasors and complex impedance  
   8. Frequency response and Bode plots  
   9. Resonance  
   10. Analysis and design of digital circuits  
   11. Analysis and design of circuits containing operational amplifiers, diodes, and transistors  
   **Lab Content:**  
   Laboratory experiments and exercises reinforce and extend concepts covered in lecture. Labs include design, construction, and testing of circuits and the simulation of circuits using standard software (e.g.,
PSPICE or Electronics Workbench).

7. REPRESENTATIVE METHODS OF INSTRUCTION:
   Typical methods of instruction may include:
   A. Lecture
   B. Lab
   C. Other (Specify): Lectures to introduce new material and topics. Textbook reading assignments to expand knowledge. Individual take-home problems to develop skills. Laboratory experiments and exercises to reinforce and extend concepts covered in lecture.

8. REPRESENTATIVE ASSIGNMENTS
   Representative assignments in this course may include, but are not limited to the following:
   Writing Assignments:
   Lab reports describing purpose of lab, supporting theory/analysis, experimental set-up, procedure, results, analysis, conclusions.
   Reading Assignments:
   Weekly reading assignments in textbook.
   Other Outside Assignments:
   Weekly problem-solving assignments.
   To be Arranged Assignments:
   N/A

9. REPRESENTATIVE METHODS OF EVALUATION
   Representative methods of evaluation may include:
   A. Exams/Tests
   B. Homework
   C. Lab Activities

10. REPRESENTATIVE TEXT(S):
    Possible textbooks include:

    Origination Date: November 2015
    Curriculum Committee Approval Date: January 2016
    Effective Term: Fall 2016
    Course Originator: Laura Demsetz