SAMPLE SYLLABUS

This syllabus is to be used as a guideline only. The information provided is a summary of topics to be covered in the class. Information contained in this document such as assignments, grading scales, due dates, office hours, required books and materials may be from a previous semester and are subject to change. Please refer to your instructor for the most recent version of the syllabus

ABET Course Syllabus EEE202

1. **Course: EEE202 Circuits I**
2. **Credits and Contact Hours:** 4 Credit Hours (lecture, lab), Topics: Engineering
3. **Course Coordinator:** ECEE Undergraduate committee
4. **Textbook:** J.D. Irwin, *Basic Engineering Circuit Analysis*, 8th Edition, John Wiley and Sons, 2002.

   Supplemental materials:
   - Laboratory Manual available from course websites (Canvas LMS) of instructors, PSpice for Windows books from various authors.
5. **Specific course information**
   a. **Catalog description:** Principles for analyzing linear and non-linear circuits. Utilization of SPICE and MATLAB. Design and measurement of linear analog electrical systems. Lecture, laboratory.
   b. **Prerequisites or co-requisites:** MAT 274 (or 275), PHY 131.
   c. **Required/elective/selected elective:** Required
6. **Specific goals for the course**
   Students can apply basic analysis, design, and measurement of linear analog electrical systems and are aware of their importance across engineering disciplines.
   Students can use AC steady state analysis on linear circuits.
   Students can use Laplace transforms to analyze linear circuits and characterize linear circuits.
   a. **Outcomes of instruction:**
      i. Students are proficient in measurement of electrical systems.
      ii. Students can analyze complex dc and ac linear circuits both analytically and with PSpice.
      iii. Students can design simple linear electrical circuits.
      iv. Students can use AC steady state analysis to find currents and voltages within circuits driven by sinusoidal sources
      v. Students can apply Laplace transforms correctly and appropriately to analyze linear circuits.
      vi. Students can relate pole and zero locations to characteristics of time-domain functions
      vii. Students understand the connection between linear circuits and differential equations.
   b. **Outcomes of Criterion 3 addressed by the course:**
      (1): contemporary circuit analysis techniques; use of differential equations and physics backgrounds;
      (5): Class required for all engineering majors and laboratory teams are multidisciplinary.
      (6): Some design and problem solving methodologies within laboratory experiments. Some modeling and design during lab experiments.
      (1,2,6): PSpice, LABVIEW and modern laboratory equipment;

7. **Brief list of topics to be covered**
   1. Basic quantities: circuit elements, power, passive sign convention (1 week)
   2. Ohm's Law, Kirchhoff's Laws, Parallel and Series circuits, (1week)
   3. Nodal and loop analysis techniques for dc and ac circuits; (2weeks)

4. Superposition, Thevenin's and Norton's Theorems (2 weeks)
5. Capacitors and inductors; circuits with energy storage elements (1 week)
6. First and second order circuits; transient response (2 week)
7. Phasors, Impedance, AC steady-state analysis (2 weeks)
8. General network characteristics; driving point and transfer functions; Poles and zeros; Bode plots (2 weeks)
9. Applications to passive filters (2weeks)

Computer Usage: PSpice simulation of ac and dc circuits. MATLAB computational analysis for ODEs.

Laboratory Experiments:

1. Introduction and Basics EEE202
2. Using SPICE
3. Using the Multimeter
4. Making Electrical Connections
5. Some Circuit Models
6. The Oscilloscope
7. Linear and Nonlinear Circuits
8. Digital Temperature Instrumentation Design
9. Waveforms, WFGs and Oscilloscope

Assessment:

Through homeworks, quizzes, tests, laboratory and final exam.

Course Contribution to Engineering Science and Design:

EEE202contributes to engineering science through circuit analysis, problem solving, computer solutions, and applications of mathematics and physics.

Person preparing this description and date of preparation: K. Tsakalis, June. 2021.