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 EEE334

1. **Course: EEE 334 Circuits II**
2. **Credits and Contact Hours:** 4 Credit Hours (lecture, lab), Topics: Engineering
3. **Course Coordinator:** Dr. Jennifer Kitchen, Associate Professor
4. **Textbook:** A.S. Sedra and K.C. Smith, *Microelectronic Circuits*, Seventh Edition, Oxford University Press.
   Supplemental materials: M.E. Herniter, Schematic Capture with Microsim™ PSpice, Prentice Hall, 2002
5. **Specific course information**
   a. **Catalog description:** Application of electric network theory to semiconductor electronics. Design of analog and digital circuits. Diodes and MOSFETS. Digital and analog circuit building blocks. Fundamentals of mixed signal circuits.
   b. **Prerequisites or co-requisites:** Engineering BS/BSE student and EEE202.
   c. **Required/elective/selected elective:** Required
6. **Specific goals for the course**
   Application of electric network theory to analysis and design of the fundamental non-linear circuits of transistor electronics.
   a. **Outcomes of instruction:**
      1. Apply electric network theory to semiconductor circuits containing diodes, transistors, operational amplifiers and digital logic gates.
      2. Learn to distinguish DC bias from small-signal analysis
      3. Analyze basic diode circuits
      4. Understand basic analog MOS circuits
      5. Learn topology and operation of CMOS digital gates
      6. Understand topology, operation and applications of current mirrors and active load circuits
   b. **Outcomes of Criterion 3 addressed by the course:**
      (1) "Fundamentals of integrated circuit design" is a marketable skill essential for students who will specialize in circuit design as well as for those who will go into technical sales and related areas. This course also provides a solid foundation for further engineering education and additional training in applications of the mathematical techniques of the electrical network theory. During both the instruction and the lab the students study problems in the circuit area that are both open-ended and more complex.
      (1,2,6) Students also use circuit simulator and modern laboratory equipment.
7. **Brief list of topics to be covered**
   1. Amplifiers, Op Amps
   2. Diodes and diode circuits
   3. MOS devices
   4. Current mirrors and active load circuits
   5. CMOS digital circuits

   Computer Usage: Schematic and Layout Entry/Verification: Cadence. Simulations: Spectre, Nanosim.
   Laboratory Experiments: Students meet weekly for a three-hour laboratory under the guidance of a TA. Experiment topics are:
   Operational amplifiers

PN junction diodes
MOS characterization
Single stage MOS Amplifiers
Introduction to digital circuits

Course Contribution to Engineering Science and Design: EEE334 contributes to engineering science through linear and non-linear circuit analysis, problem solving, computer simulations and synthesis of device physics and circuit analysis for the purpose of integrated circuit design.

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