1. ECE 534/535: Analog Integrated Circuit Design/Laboratory

2. 3 credits: 1-110 minute lecture sessions/week, 1 credit weekly lab assigned

3. Thomas Chen

4. None – Lecture notes assembled by the instructor with additional reading materials provided

5. Course Information
    a. Optoelectronic and optical components for fiber optics; communications system physical layer issues and examples. Analog integrated circuits are designed and simulated using modern software tools
    b. Prerequisite: ECE 332 with a C or higher; Concurrent registration required in ECE534 and ECE 535
    c. Selected Elective: Electrical Engineering; Computer Engineering

6. Goals for the Course
    a. Course Learning Outcomes
        i. Describe the basic principles of designing practical analog circuits
        ii. Choose from different circuit architectures based on a given design specification
        iii. Design different analog circuits using MOS transistors and capacitors
        iv. Analyze complex analog circuits using Cadence design tools
        v. Perform design tradeoffs among cost, power consumption, performance, and noise in designing analog circuits
        vi. Describe the general context in which the analog circuits are used in a variety of systems and SOCs
    b. Student Outcomes
        1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
        2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and welfare, as well as global, cultural, social, environmental, and economic factors
        3. An ability to communicate effectively with a range of audiences
        4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
        5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
        6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
        7. An ability acquire and apply new knowledge as needed, using appropriate learning strategies

7. Topics Covered
    Introduction to analog design
    Amplifier designs in terms of performance, power, and noise tradeoffs
    Reference circuit design
    Switched-capacitor circuits
    Device models and simulation tools for circuits
    Analog IC layout
    Applications of analog circuits in sensors and communication systems

Course last offered in Fall 2014