1. ECE 538: Design/Analysis of Analog Digital Interface

2. 3 credits: 2-75 minutes lecture sessions/week

3. Thomas Chen

4. None – readings provided by instructor

5. Course Information
   a. Topics of interface circuit designs analog and digital interfaces. Basic concept of designing and analyzing analog and digital interface circuits.
   b. Prerequisites: ECE 312 with a C or higher; ECE332 with a C or higher; ECE451 with a C or higher
   c. Selected Elective: Electrical Engineering; Computer Engineering

6. Goals for the Course
   a. Course Learning Objectives
      i. Describe the basic principles of designing analog and digital interface circuits
      ii. Choose form different converter architectures based on a given design specification
      iii. Design different analog and digital interface circuits using MOS transistors and capacitors
      iv. Analyze analog and digital interface circuits using Cadence design tools
      v. Perform design tradeoffs among cost, power consumption, performance, and precision in designing analog and digital interface circuits
      vi. Discuss the general context in which the analog and digital interface circuits are used in data communication 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
      6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. Topics Covered
   Architectural and circuit level design and analysis of integrated analog-to-digital and digital-to-analog interfaces in modern CMOS VLSI technology
   Analog-digital converter designs using Nyquist and over-sampled techniques
   Sample/hold amplifiers
   Continuous-time and switched-capacitor filters
   Low power mixed signal design techniques
   Data communication systems including interface circuitry
   CAD tools for analog design for simulation and synthesis

Last offered Spring 2015