ECE894 Hierarchical Design, Capture, and Verification of Mixed Signal Systems.

Objectives :
1. Learn the advanced principles of combining analog, RF, and digital simulation strategies for design and verification of mixed signal systems.

2. Develop capabilities in using modern CAD tools for complete system design – initial specifications to manufactureable descriptions.

Instructor: Steven B. Bibyk http://www.eleceng.ohio-state.edu/~bibyk CL381

Texts: Verilog-A Users Manual, Cadence Design Tools and ADS Design Tools (online)
Optional: Analog Behavioral Modeling with the Verilog-A Language by Fitzpatrick & Miller

Weekly schedule:

1. Introduction, overview of mixed signal system design flow, analog & RF design flow, course plan.

2. Mixed Signal System Descriptions and Simulations.
Compare System Simulation Strategies in Matlab, Excel, HDLs, Spice, SpiceRF.

3. Analog & Mixed Signal Hardware Description Language (HDL-AMS) Behavioral Descriptions: Statements, Operators, and Events in Verilog and Verilog-A

4. Wireless System Architectures
Communication Transceivers – phone, internet
Wireless Sensor Network platforms
Ultrawideband Systems, Radars

5. Project Formation.

6. Top down design with bottom up verification flows.

7. Detail Examples:
Amplifiers, Logic Gates, Data Converters
Reconfigureable Data Converters, LNAs, Mixers, Analog Filters

8. Mixed Signal Testbenches – Analog & RF verification vs. Digital verification.

9. Mixed Language Simulations.

10. Project Presentations, Course Review

Grading:
Project - 60% Homework - 40%