THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Integrated Circuits Test and Measurement

ECE 5120

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Parametric testing techniques for analog, digital, mixed and RF ICs, DSP-based testing; noise effects on accuracy; Design-for-Test and Built-in-Self Tests.

Prerequisites and Co-requisites:
Prereq: 3020, or 323 and 351, or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Course Goals / Objectives:
- Learn digital sampling techniques to perform analog parametric testing, including DC, frequency response, harmonic and inter-modulation distortion, as well as noise behavior of mixed-signal circuits and systems
- Apply digital sampling techniques to analog, sampled-data, RF and High-Speed digital channels. DSP-basics, such as sampling; windowing and frequency transforms (DFT and FFT) will be applied.
- Learn to quantify noise behavior and its effect on measurement accuracy.
- Testability, Design-for-Test (DFT) and Built-in-Self-Test (BIST) methodologies will also be introduced.
- Be introduced to industrial test methodologies through a test lab project using commercially available parts.

Course Topics:

- Introduction to micro-system test
- Concurrent engineering, data sheets and test plans
- Mixed signal ATE tester architectures , DIB Design
- Absolute accuracy, resolution and test repeatability
- DC measurements: offset, gain, leakage, PSRR, etc
- DSP-based testing and AC channel testing
- ADCs and DACs test and characterization
- RFIC test
- Introduction to design for test
- Built-in self-test techniques
- Lab project preparation and introduction to software and hardware used in the project

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Designation:

Elective