ECE 682 VLSI Test Concepts

Course Instructor
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Lecture
Mondays 4:30 to 7:10PM
Nguyen Engineering Building 1109

Prerequisites
ECE 545 and 586 or permission of instructor

Office Hours
Mondays 3:30 to 4:30PM
Nguyen Engineering Building 3707

Credit
Course: 3

Grading
Homework: 30%
Mid-term exam: 30%
Final exam: 40%

Course Description
Today’s advanced VLSI chips can contain in excess of 750 Million transistors. Even in state of the art semiconductor facilities, many manufactured chips contain defects buried deep with the IC. To maintain the high quality levels that customers demand, test patterns must be developed which verify that every transistor on a given die is functioning correctly.

This is the challenge of VLSI Test. In an environment in which IC transistor counts are exploding, processor speeds exceed 3 GHz, and data transfers occur at ultra-high rates asynchronously, testing has been accepted as an essential aspect affecting all aspects of architecture, design, and fabrication.

As a field of study, Test Engineering is intertwined with Design Automation, Computer Architecture, Semiconductor Process Engineering, Logic and Circuit Design, to name a few.

This course introduces the student to this broad, constantly evolving field. Lectures will cover the evolution of test from manually generated test methods to today’s state of the art techniques.

Outline
Introduction to Testing (1 week)
Test Economics and Product Quality (1 week)
Fault Modeling (1 week)
Logic Testing (3 weeks)
Memory Testing (2 weeks)
Design for Testability (3 weeks)
Advanced testing (2 weeks)
Review and the Future of Test (1 week)

Literature
Recommended Text