

ECE 7821 (Approved): Mixed Signal Verification and CAD Tools

Course Description

Principles of combining analog, RF, and digital design, simulation, and verification strategies using modern CAD tools.

Prior Course Number: ECE 894Z or 822

Transcript Abbreviation: Mixed Signal Tools

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Graduate

Student Ranks: Masters, Doctoral

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Odd Years

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 5020, 622, or 720.

Exclusions: Not open to students with credit for 894Z or 822.

Cross-Listings:

Course Rationale: Existing course.

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.1001

Subsidy Level: Doctoral Course

Course Goals

Develop capabilities in verifying mixed signal system design using CAD tools
Study mixed signal designs such as signal processing combined with data converters
Develop a design report that demonstrates verification of a mixed signal system design

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Mixed-signal descriptions in Matlab, Spice, and hardware description languages	8.0							
Analog hardware description languages	8.0							
VLSI system architectures in communication, signal processing, and control	8.0							

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Top-down design with bottom-up verification flows	8.0							
Mixed-signal testbenches - analog/RF verification combined with digital verification	7.0							

Representative Assignments

Homework
Design project

Grades

Aspect	Percent
Homework	20%
Exam I	30%
Project	50%

Representative Textbooks and Other Course Materials

Title	Author
<i>Handout</i>	

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	a	An ability to apply knowledge of mathematics, science, and engineering.
***	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
**	c	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
*	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.
*	g	An ability to communicate effectively.
*	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
***	i	A recognition of the need for, and an ability to engage in life-long learning.
**	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Additional Notes or Comments

Delted text Analog Behavioral Modelling with the Verilog-A Language by Fitzpatrick and Miller 3/29/12

Updated course title, prereqs, exclusions, goals and topics to conform to university format 3/29/12

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