Mixed Signal IC Test 2

EEE 4930/5934 Mixed Signal IC Test II, Fall 2015 Course Outline

Note: We will be adding TINA Spice simulations to the Mixed Signal IC Test course term.

Course Outline:
Weekly Date, (No. of Classes) Class topics, Readings, In Class Notes in pdf form.

08/24 (2) Syllabus (update this document) Permission and survey. Lecture topics:
digital interface to sensors and lab 1 digital temperature measurements. Also spice circuit simulator.

Reading TINA spice simulator manuals and instrument temperature sensor documents

In Class Notes Lecture 1, In Class Notes Lecture 2,
Audio Lecture 1, Audio Lecture 2,

08/31 (2). Lecture topics: 2 op amp loop measurements and op amp stability

Lab 1 Digital temperature sensor
Schematic for Lab 1 loadboard
Homework1_2015.pdf

NI TESTER AND VI FILES FOR LABS See the Software Quick Start Guide
Remote access information link for UF ece: http://www.ece1.ufl.edu/remote.html

Reading Chapter 3.7 to 3.9 DC and Parametric Measurements Roberts, Taenzler and Burns,

In Class Notes 3, In Class Notes 4
Audio Lecture 3, Audio Lecture 4

09/07 (2) Labor Day, Lecture Topic Sampling Theory
Lab 1 Digital temperature sensor

Reading Chapter 8 Sampling Theory, Roberts, Taenzler and Burns

Homework 1 Solution

In Class Notes 5, In Class Notes 6,

Audio Lecture 5, Audio Lecture 6

09/14 (2) Lecture Topics: Sampling Theory

Reading Chapter 8 Sampling Theory, Roberts, Taenzler and Burns

Lab 2 Two Loop Op Amp Measurements

Schematic for Lab 2 Loadboard

Homework 2

In Class Notes 7, In Class Notes 8

Audio Lecture 7, Audio Lecture 8

09/21 (2) Lecture topic, Group Project, Altium designer

Lab 2 Two Loop Op Amp Measurements

Tester Interface board, resources for group project.

Project Team and Sensor Project Selection Report

Reading Altium designer tutorials and documentation.

In Class Notes 9, In Class Notes 10,

Audio Lecture 9, Audio Lecture 10,

9/28 (2) Lecture Topics: DAC testing
Lab 2 Two Loop Op Amp Measurements

Reading Chapter 5 Yield Measurement, Accuracy and Test Time, Roberts, Taenzler and Burns

Homework 3

In Class Notes 11, In Class Notes 12

Audio Lecture 11, Audio Lecture 12

10/5 (2) Lecture Topics: DAC Testing

Homework 2 Solution

Homework 3 Solution

Lab 3 DAC Testing DC

Schematic of Lab 3 Loadboard

Read Chapter 6, DAC testing, Roberts, Taenzler and Burns

In Class Notes 13, In Class Notes 14

Audio Lecture 13, Audio Lecture 14

10/12 (2) Lecture, Example Midterm Problems, Midterm 1,

Makeup Lab week (no assigned lab)

Homework 4

In Class Notes 15

Audio Lecture 15

10/19 (2) Lecture Topic: DAC testing

Lab 3 DAC Testing DC
Schematic of Lab 3 Loadboard

Midterm 1 Solution

New Labview Code for IC Test Class M79X96293

Read Chapter 6, DAC testing, Roberts, Taenzler and Burns

In Class Notes 16, In Class Notes 17

Audio Lecture 16, In Class Notes 17

10/26 (2) Student Project Writeup, ADC Testing

Lab 3 DAC Testing DC

Student Group project progress report

Read Chapter 7, ADC testing, Roberts, Taenzler and Burns

Homework 4 Solution

In Class Notes 18, In Class Notes 19,

Audio Lecture 18, Audio Lecture 19,

11/02 (2) Lecture Topics: ADC testing, Homecoming Holiday Nov. 7

Lab 4 DAC Testing Dynamic performance.

Read Chapter 7, ADC testing, Roberts, Taenzler and Burns

Read Temperature Sensor Handouts, Chapter 15, Tester Interfacing, DIB design Roberts, Taenzler and Burns,

In Class Notes 20, In Class Notes 21

Audio Lecture 20, Audio Lecture 21
11/09 (2) Lecture Topics: DSP-Based Testing, Veterans Day Nov. 11
Lab 4 DAC Testing Dynamic performance.
Read Chapter 8 DSP-Based Testing, Roberts, Taenzler and Burns
In Class Notes 22, In Class Notes 23
Audio Lecture 22, Audio Lecture 23

11/16 (2) Lecture Topic: DSP-Based testing, Exam II, on Dec 4
Develop your group project software and boards in Lab
Study Guide Exam II
Read Chapter 8, DSP-based Testing, Roberts, Taenzler and Burns
In Class Notes 24, In Class Notes 25
Audio Lecture 24, Audio Lecture 25

11/23 (1) Lecture Topic Review problems for Exam II, Thanksgiving Holiday November 25 to 28, Exam II December 4
Develop your group project software and boards in Lab
In Class Notes 26
Audio Lecture 26

11/30(2) Student Group Project Presentations, Exam II Dec 4.

12/7 (1) Student Project Presentations, Research Lecture
Read Chapter 16 Design for Test
There is no final exam.

EEE 4930/5934 Mixed Signal IC Test 2, Fall 2015 Syllabus (Data Sheet)

Mixed Signal IC Test Contact Information
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Web: http://www.tec.ufl.edu/~wre/

Course Sequence Goals: Develop understanding of the production testing and validation of mixed-signal ICs and systems. The testing of mixed-signal ICs include both analog and digital circuits and requires an understanding of both and the IC test environment to be successful. This course is the second of a two semester sequence in Mixed Signal IC testing.

This course was jointly developed in the last six months by the UF ECE and Texas Instruments, Tucson, TX. These experiences of this course sequence will make better engineers of all of us (including the TA and the instructor). This course sequence is supported heavily by Texas Instruments and National Instruments and the students who do well will be in great hiring demand by US semiconductor and US test companies. The course sequence is limited to 40 students at this time.

Course Topics: Mixed signal sensors, I2C, Two loop op amp test, Sampling theory, DAC Test, ADC Test, DSP-based Test and Altium Designer Mixed-Signal ICs, Labview and the National Instruments Savage Tester.

Prerequisite: Mixed Signal IC Test 1
**Class Period and Location:** MWF, 8th periods, LAR 310. Most weeks we will meet for 2 lectures only. Students will go to lab most weeks on to perform lab and video work at home.

**Lab Period and Location:** Labs will be given Monday through Friday in NEB 289 on a sign up basis. Computer labs will be done at home.

**Office Hours:** Monday, Wednesday and Friday: 1:45pm to 2:45pm, NEB.

**TA:** Alden Fernandes, contact information to be announced.


**Course Materials:** I will be using the Syllabus on the Canvas system to index of the daily class materials posted for you to review and to learn from. So, you can find most learning materials by clicking on a link from the Syllabus. I try to post all written materials and video materials used in the lectures to assist in your learning.

There will be folders that contain course materials (Course Notes, Labview notes, In Class Notes, etc) in the Resources section of Canvas (see tabs on the left of the Canvas section).

**Computer and Software Required:**
Workstations with Labview system on campus, off-campus you can use X-Windows or X-terminal on a high-speed internet link to UF Campus Computers.

All students are required to have a Gator link account and use Canvas for course handouts, grade information, course notices, etc, see e-learning and Canvas

**Course Study Requirements:**
Students are responsible to study all in class materials including those written on the board and presented orally, all Class Handouts all assigned readings, all projects and homework. Absence from class can result in missing materials tested on exams.

**Work Requirements:**

Homework: 6-10 Homework and SPICE Assignments
Computer Laboratories and projects: Weekly laboratory work
Exams: 2 Exams during the semester, No final Exam

**Examinations:** (No Final Exam)
Quizzes for reading and video learning topics
Exam 1: Tentatively, Beginning of October
Exam 2: Tentatively, December 4

**Make Up Exam Policy:** Students are expected to attend exams at the scheduled times. Exams can be made up if there is a genuine medical emergency with a doctor's or clinic medical note or a family emergency with some documentation.

**Passing Grades and Grade Points Effective Summer A 2009**

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<th>Letter Grade</th>
<th>A</th>
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<th>B+</th>
<th>B-</th>
<th>C+</th>
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<td>Grade Points</td>
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**Preliminary Grading Policy:**
Exams and Quizzes - 50%
Homework and Projects - 50%
Attendance – 5%

**Academic Honesty:**
All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action.

This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide documentation to the instructor when requesting accommodation.