ECE 417/517–Mixed-Signal IC Design: Course Syllabus

Spring 2017, University of Idaho

Course Site : <u>http://lumerink.com/courses/ece517/s17/ECE517.htm</u>

Instructor	: <u>Vishal Saxena</u>
Email	: vsaxena AT uidaho DOT edu
Time	: Tue and Thu, 9:30-10:45 AM
Course dates	: Jan 12, 2017 – May 4, 2017
Location	: JEB 26 (Please note the change of place)
Office Hours	: Tue & Thu 11:15 AM-12:15 PM (or by appointment), BEL 318
Holidays	: Spring Break
Final Exam ti	me : Friday, May 12, <u>7:30-9:30 AM</u>

Textbook – None. Lecture notes and handouts will be used. Following references are useful to supplement the course material:

- Design of Analog CMOS Integrated Circuits, B. Razavi, McGraw-Hill.
- High-Frequency Integrated Circuits by Sorin Voinigescu, 1st ed., Cambridge.
- CMOS Integrated Analog-to-Digital and Digital-to-Analog Converters by Rudy J. van de Plassche, Springer.

For detailed references and handouts see course page.

Course content –Data Conversion and spectral estimation fundamentals, Nyquist rate ADCs: Flash, SAR, Pipelined, Time-interleaved ADCs. Overview of oversampling ADCs. DACs.

High-speed Link design issues (if time permits): Driver Circuits, Equalizers, PAM signaling, ADCs for high-speed links.

Pre-requisite: ECE 410 or permission.

Note: This is an advanced-level course. It is important that the students have a good understanding of Analog and Digital Circuit fundamentals.

CAD software information

The course will require extensive use of Cadence Design System in Linux environment. Set up instructions are available <u>here</u>. Outstation students please note that the VPN software requires Windows 7 or higher OS.

The course **Piazza** page is located at <u>https://piazza.com/uidaho/spring2017/ece517/home</u>. Use the site to post questions and for discussions.

The complete **MATLAB code archive** for the course is <u>here</u>. Some of the scripts use the Matlab Delta-Sigma Toolbox by R. Schreier available for download <u>online</u>. The toolbox manual is <u>here</u> with a <u>single page summary</u>.

Workload (Grading)

25% Homeworks25% Midterm Exam25% Project 125% Project 2 or Final Exam

This grading scale is for both ECE417 and ECE517 students. Students are required to write their project reports in provided IEEE format. Microsoft Word Templates will be available at the class web site for Project report. Using these templates will be mandatory.

Make-Up Policies

Only students presenting medical or official university excuses to the instructor will be allowed to take a make-up exam or other missed assignments. Whenever possible, arrangements should be made with the instructor prior to the regularly scheduled exam or assignment due date. Making these arrangements is entirely the responsibility of the student. Make up exams or other assignments may differ from those given at the regularly scheduled time, and whether an absence is deemed to be excusable is at the discretion of the instructor.

Academic Honesty

Academic honesty is governed by Article II of the University if Idaho's Student Code of Conduct <u>http://www.webs.uidaho.edu/fsh/2300.html</u>. Cheating on classroom or outside assignments, including examinations is a violation of this code. Incidents of academic dishonesty will be kept on file by the instructor and may be reported to the dean of students. Such instances of academic dishonesty may warrant expulsion from the course and a failing grade. All students should be aware that even one incident of academic dishonesty may also merit expulsion from the University.

Policies

- Homework and exam scores become final one week after they are returned to the class.
- Late submissions of assignments and project reports are not encouraged; however, if you cannot finish in time and submit late before the solutions are available, a 25% per day compounding deduction will be applied on the final grade. (Ex.:100 points assignment submitted 3 days late will be graded on 42 points, 1 day on 75, 2 days 56, 4 days 32, etc.).
- Submission will not be accepted if the solutions are distributed by any means.
- Assignments have to be turned in during class session. I will not accept any assignment dropped in my office mailbox without getting my permission earlier. You may consult with others on assignments, provided you only submit your attempt at the work. Identical assignments will receive a grade of zero and be considered as academic dishonesty case. Assignment is considered one day late if it is not turned in before the class time on the day it is due.
- Neither the final exam nor final project will be returned at the end of the semester.