STANFORD UNIVERSITY
Department of Electrical Engineering

EE315: Analog-Digital Interface Circuits

https://canvas.stanford.edu/courses/70553

TIME:	Class: Tue & Thu, 12:00 - 01:20 pm, Huang 18 Review Session: Fri, 3:30 - 4:20, Huang 18
INSTRUCTORS:	Boris Murmann, Dante G. Muratore
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GRADING:

Homework	30% (lowest HW score will be dropped)
Midterm Project	30%
Final Exam	40%

REFERENCE BOOKS (not required)

- Chan Carusone, Johns, Martin, Analog Integrated Circuit Design, 2nd ed., Wiley, 2011.
- Schauman, Xiao and Van Valkenburg, Design of Analog Filters, 2nd ed., Oxford University Press, 2009.
- Pelgrom, Analog-to-Digital Conversion, 2nd ed., Springer, 2013.
- Kester, The Data Conversion Handbook, Newnes, 2005. https://goo.gl/g8nekn

BULLETIN BOARD: Please use the "Discussions" feature on Canvas for group discussions or to post questions.

PREREQUISITES: EE214B

It is assumed you have prior exposure to analog circuit design and device modeling as covered in EE214B. The course also requires familiarity with Spice; prior exposure to MATLAB is a plus, but not absolutely necessary. In addition, you should be familiar with basic signals and systems theory (Laplace- and z-transform).

COURSE CALENDAR (Tentative)

Date	Lecture	Assignments
Tue 09/26	1: Introduction, Sampling	
Thu 09/28	2: Quantization	HW1 out
Tue 10/03	3: Reconstruction, D/A conversion, segmentation	
Thu 10/05	4: D/A converter circuits	HW1 due, HW2 out
Tue 10/10	5: Sampling circuits	
Thu 10/12	6: Sampling circuits	HW2 due, HW3 out
Tue 10/17	7: Offset and flicker noise suppression	
Thu 10/19	8: Offset and flicker noise suppression	HW3 due, HW4 out
Tue 10/24	9: ADC architectures, comparators	
Thu 10/26	10: Flash ADCs	HW4 due, HW5 out
Tue 10/31	11: SAR ADCs	
Thu 11/02	12: SAR ADCs	HW5 due, Project out
Tue 11/07	13: SAR ADCs, time interleaving	
Thu 11/09	14: Pipeline ADCs	
Tue 11/14	15: Delta-Sigma ADCs	
Thu 11/16	16: Delta-Sigma ADCs	
Tue 11/21	**Thanksgiving Recess**	
Thu 11/23	**Thanksgiving Recess**	
Tue 11/28	17: Filters	
Thu 11/30	18: Filters	Project due, HW6 out
Tue 12/05	19: Filters	
Thu 12/07	20: Project presentations	HW 6 due
Thu 12/14	**Final Exam, 12:15-3:15 pm - HEWLETT201**	

FAQ

When/how should I submit my homework?

All students, SCPD and local, should submit their homework by uploading a PDF file to Canvas under the Assignments tab. Homework must be uploaded by the specific due date and time.

May we work on the project in groups?

Yes, you are encouraged to work on the project in groups of two. Each group will submit one write-up. In case you can't find a partner, it is OK to work alone. It is NOT acceptable to work in groups of three.

Which program will we use for circuit simulation?

We will use Cadence Virtuoso Schematic Editor, Analog Design Environment, and SpectreRF as our main tools. Simulation examples and setup information will be covered in the first review session and homework1. You may use other tools "at your own risk."

Do I have to be a Matlab wizard to make it through this class?

No, we'll be using only a fairly basic subset of the Matlab functionality. Even though prior exposure to Matlab will help, you should also be able to pick up the skills you need during the course. In case you haven't worked with Matlab at all, we recommend that you work through the tutorial at: http://www.mathworks.com/academia/student_center/tutorials/launchpad.html.

I cannot attend your scheduled office hours. Are you available at other times?

Feel free to email me to set up a meeting on an as-needed basis.

I am an SCPD student, and I must get a grade of B or higher, otherwise I have to pay. Can you guarantee that I won't have to pay?

No, of course not. You earn your grade; we don't randomly generate it. But, this is a ~*B*+-centered course, as are most 300-level graduate courses here. To minimize the likelihood of having to pay, stay current on the homework and, especially, allot plenty of time to do a good job on the midterm project. Many SCPD students find themselves in trouble time-wise, because of customer visits, unexpected tape-out problems, etc., at their place of employment. My advice is to expect the unexpected, and budget enough extra time for EE315.

I need to take the final exam at other than the scheduled time. May I?

Such arrangements are made on a case-by-case basis, and we cannot guarantee flexibility in this matter. The most common acceptable reason is a *demonstrable* scheduling conflict with another course (which would imply that you are taking two courses that are scheduled at the same time). Please alert us as soon as possible.

I am a remote student; how can I gain access to Stanford's e-libraries (such as IEEE Xplore)?

You can setup proxy access using your SUNet ID. See http://library.stanford.edu/apcproxy/.