EE P 532 A Au 19: Design Of Digital And Analog Electronic Circuits

EE P 532 Digital and Analog Electronic Circuits

University of Washington Electrical & Computer Engineering

Autumn Quarter 2019

Course Syllabus

Lectures: Thursdays, 6:00-9:50p, EEB 037

Instructor: Jason Silver

Email: silverjd at uw dot edu

Office: Canvas chat or Skype

Office hours: Wednesdays @ 7pm

Teaching Assistant: Ellory Freneau

Email: efreneau at uw dot edu

Office: Canvas chat or Zoom

Office Hours: Tuesdays @ 6pm

Required Textbook: B. Razavi, *Design of Analog CMOS Integrated Circuits*, 2nd Ed, McGraw-Hill, 2016.

Additional References: Gray, Hurst, Lewis, Meyer, *Analysis and Design of Analog Integrated Circuits*, 5th Ed, Wiley, 2009.

Rabaey, Chandrakasan, Nikolic, *Digital Integrated Circuits*, 2nd Ed, Pearson, 2003.

Course Description:

In this course, we will focus on theoretical and practical aspects of CMOS Integrated Circuit Design, with an *emphasis on analog circuit analysis and design*. Some treatment will be given of digital design topics, but the focus will be more circuit concepts (i.e.

voltages and currents) than logic. Our study will include a brief review of device physics, an investigation of amplifier topologies, feedback, stability, and practical simulation and implementation issues. *Although there are no official prerequisites for the course, you should be very comfortable with basic circuit theory and analysis techniques before enrolling.*

After completing the course, students will have developed the insight and experience essential to the design of transistor-level integrated circuit building blocks (single-stage amplifiers, bias circuits, logic gates).

Weekly assignments will be given that match the lecture and textbook. These assignments will involve hand analysis, computer simulation, and a significant design component. Emphasis will be placed on conceptual understanding, “back-of-the-envelope” calculations/analysis, and circuit intuition.

There will be two midterms, each covering approximately half of the course material. Both exams will be closed-book and closed-notes.

Design Project:

Several design projects will be assigned. These projects will involve the design and simulation of integrated circuit blocks towards specifications which will be provided in class. Collaboration on projects with one colleague from class is allowed (and encouraged), but not required. A brief (approximately 10 minute) final presentation, or “design review”, will allow individuals and groups to share their designs with the class.

Grading:

- Weekly Assignments: 30%
- Midterm Exam 1: 20%
- Midterm Exam 2: 20%
- Design Projects: 30%

Please submit your work by the assigned due dates. No late homework or projects will be accepted unless approved in advance by the instructor.