

EE P 538 Low Noise Analog Circuit Design
University of Washington Electrical & Computer Engineering
Spring Quarter 2021

Course Syllabus

Lectures: TBD

Instructor: Jason Silver
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Teaching Assistant: TBD
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Required Textbook: C.D. Motchenbacher, *Low Noise Electronic System Design*, 1st Ed, Wiley-Interscience, 1993.

Course Description:

In this course we will explore concepts related to low-noise analog circuit design. Students should be very comfortable with conducting basic linear circuit analysis (Kirchoff's and Ohm's laws, Thevenin/Norton equivalent circuits). Students should be familiar with transistor operation (FET and/or BJT) and should be comfortable with large- and small-signal analysis of transistor circuits. Familiarity with mathematical concepts related to engineering (Fourier/Laplace transforms, complex numbers) is required.

Tentative Schedule:

<u>Week</u>	<u>Topic</u>	<u>Reading</u>
1	Fundamental Noise Mechanisms	Chapter 1
2	Noise figure	Chapter 2
3	Noise in Bipolar Transistors	Chapter 5
4	Noise in Field Effect Transistors	Chapter 6
5	Low noise analog design techniques	Chapter 9
6	Nonlinearity and mismatch	Course notes
7	Transimpedance amplifier design	Course notes
8	Noise in sampled-data circuits	Course notes
9	Chopping and auto-zeroing	Course notes

Design Project:

A design project will be assigned toward the end of the quarter, and will take the place of weekly assignments. The project will involve the design and simulation (using LTSpice) of analog circuits toward written specifications. Students will submit a report detailing their design decisions, analysis, and simulation results.

Grading:

- Weekly Assignments: 40%
- Midterm Exam: 20%
- Design Project: 40%