

# EE P 538 Low Noise Analog Circuit Design

University of Washington Electrical & Computer Engineering  
Spring Quarter 2022

## Course Syllabus

**Instructor:** Shanshan Dai  
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**Teaching Assistant:** TBD  
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Office Hours: TBD

**Recommended 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.

### Tentative Schedule:

<u>Week</u>	<u>Topic</u>	<u>TextBook</u>
1	Noise fundamentals	Chapter 1
2	Amplifier noise	Chapter 2,3
3	Noise in Bipolar Transistors	Chapter 5
4	Noise in Field Effect Transistors	Chapter 6
5	Sensor noise	Chapter 8
6	Low-Noise Design	Chapter 9
7	Nonlinearity and Distortion	
8	Trans-impedance Amplifier Design	
9	Chopping and Auto-zeroing	
10	Final Project Presentation	

**Assignment:**

Weekly assignments will be given that match the lecture and (in most cases) the 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.

**Exam:**

There will be a single exam covering approximately half of the course material. The exam will be “take-home” format due to the online nature of the course.

**Design Project:**

A project will be assigned involving the design and simulation of low-noise analog circuits towards written specifications pertaining to noise, power, and cost.

**Grading:**

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

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