CMOS Analog Integrated Circuit Design

Department of Electrical Engineering
Amirkabir University of Technology
Instructor: Prof. Mohammad Yavari
Fall 2025

Topics:

1. MOS Device Physics and Modeling
2. Current-Mirrors and Single-Stage Amplifiers
3. Differential Amplifiers
4. Frequency Response of Amplifiers
5. Noise Analysis and Modeling
6. Basic Operational Amplifiers and Frequency Compensation
7. Advanced Operational Amplifiers
8. Bandgap References
9. Switched-Capacitor Circuits
10. Nonlinearity and Mismatch
11. CMOS Processing Technology
12. Layout and Packaging

Texts:

1. B. Razavi, *Design of Analog CMOS Integrated Circuits*, McGraw-Hill, Second Edition, 2016.
2. T. C. Carusone, D. A. Johns, and K. W. Martin, *Analog Integrated Circuit Design*, John Wiley & Sons, Second Edition, 2012.

References:

3. R. Jacob Baker, *CMOS Circuit Design, Layout, and Simulation*, Fourth Edition, Wiley/IEEE Press, 2019.
4. P. Allen and D. Holberg, *CMOS Analog Circuit Design*, Oxford University Press, Third Edition, 2012.
5. P. Gray, P. Hurst, S. Lewis, and R. Meyer, *Analysis and Design of Analog Integrated Circuits*, 6th Edition, John Wiley & Sons, 2024.
6. W. M. Sansen, *Analog Design Essentials*, Springer, 2006.
7. F. Maloberti, *Analog Design for CMOS VLSI Systems*, Kluwer Academic Publishers, Dordrecht, 2001.
8. K. Laker and W. Sansen, *Design of Analog Integrated Circuits and Systems*, McGraw-Hill, 1994.
9. R. Gregorian, *Introduction to CMOS Op-Amps and Comparators*, New York: John Wiley & Sons, 1999.
10. R. Gregorian and G. C. Temes, *Analog MOS Integrated Circuits for Signal Processing*, New York: Wiley, 1986.
11. Y. Tsividis and Colin McAndrew, *Operation and Modeling of the MOS Transistor*, Oxford University Press, Third Edition, 2011.
12. Class Notes and Selected Publications.

Requirement:

Electronics III

Grading:

Homeworks: 10% Design Projects: 15% Midterm Exam: 35% Final Exam: 40%