

IIT TIRUPATI, 2023
EE530L, Analog VLSI Design

Welcome to my course on **Analog VLSI Design**. In this course, we are going to understand and analyze the functioning of basic analog circuits, as they are fabricated in modern VLSI technologies.

Specifically, we shall look at

1. VLSI fabrication of analog devices;
2. Current mirrors and biasing;
3. Single-stage and differential amplifiers;
4. Operational amplifiers;
5. Feedback and frequency compensation;
6. Noise and Mismatch;
7. Switched-capacitor circuits;
8. Bandgap references (if time permits).

At the end of this course, students are expected to be able to

1. Understand important design specifications that are relevant to analog VLSI design;
2. Analyze analog circuits for their performance;
3. Design simple analog building blocks that can be fabricated using VLSI technologies.

Lectures are during the **D slot** period on Tuesday (10:00 to 11:00 hrs), Thursday (09:00 to 10:00 hrs), and Friday (11:00 to 12:00 hrs), at Classroom 6, in Department Building 2. I will be available for office hours on Mondays from 13:00 to 14:00 hrs in the Administration Block (old E Block) Room number 109.

Your **final grades** in the course shall be computed as follows:

- 20% for Homework.
- 20% for Test 1.
- 20% for Test 2/project.
- 40% for the final end-semester exam.

All homework assignments and solutions shall be posted on the course's Google classroom website.

I shall be using the following **textbooks** for this course:

1. P. R. Gray and R. G. Meyer, *Analysis and Design of Analog Integrated Circuits*, 5th edition, Wiley, 2010.
2. A. S. Sedra, K. C. Smith, and A. N. Chandorkar, *Microelectronics Circuits: Theory and Applications*, 5th edition, Oxford University Press, 2013.

Besides the above, you may find the following references useful:

1. P. E. Allen, and D. R. Holberg, *CMOS Analog Circuit Design*, 3rd edition, Oxford University Press, 2017.

And lastly, I expect all students to follow the student honour code, and abide by the Institute's academic honesty policy. Incidents of cheating and malpractice shall be reported to the Dean, and appropriate actions taken. That being said, I do not expect to have to resort to the above punitive measures in this class.