

IIT Faculty Name: Prof. Hitesh Shirmali

Topic Name: Differential Amplifiers

Relevant Course Name: Analog Electronic Circuits

Relevant Department: Electrical Engineering, Electronics Engineering, Instrumentation Engineering

Relevant Semester: B.Tech third and fourth year

IIT: Mandi

Topic Description and Outline:

Lecture: 1

[2 hours]

- Understanding of single ended, pseudo differential, differential and fully differential amplifier
- Differential operation requirement, process, voltage and temperature (PVT) understanding
- Amplifier design check list in industry
- Single ended differential operation, basic differential pair (qualitative and quantitative analysis)

Lecture: 2

[2 hours]

- Common mode and small signal gain for differential pair with various loads such as resistive, diode and current
- Miller theorem

Lecture: 3

[2 hours]

- Frequency response analysis: poles, zeros and bandwidth calculation (3-dB and unity gain bandwidth)

Pre- requisites: Network/Circuit analysis, Control theory