



ANALOG ELECTRONIC CIRCUITS

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Department of Electrical and Electronics Engineering
IIT Kharagpur

TYPE OF COURSE : New | Core | UG**COURSE DURATION** : 12 weeks (27 Jan' 20 - 17 Apr' 20)**EXAM DATE** : 26 Apr 2020**PRE-REQUISITES** : Electrical technology and, Semiconductor Devices**INTENDED AUDIENCE** : B.E/B.Tech,B.Sc in Electrical and Electronics discipline**INDUSTRIES APPLICABLE TO** : Semiconductor companies such as, Intel, TI, Analog Devices, NXP, ST-microelectronics, Infineon**COURSE OUTLINE :**

This course on Analog Electronic Circuits has been designed primarily as a core course for undergraduate students and, as a refresher course for master level students and circuit designers working in industry. It starts with basic circuit components and circuit concepts and then, gradually moves to practical building blocks of analog electronic systems. In this course, a serious attempt has been made to make a balance between theory and practice so that the discussed circuits can be constructed in an undergraduate level laboratory class and their measured performance can be easily compared with the analytically predicted performance.

ABOUT INSTRUCTOR :

Pradip Mandal is a professor in the Electronics and Electrical Communication Engineering Department of IIT Kharagpur. He received his PhD degree from Indian Institute of Science, Bangalore in 1999. He has more than seven years of hands-on design experience from three different IC design companies.

COURSE PLAN :**Week 1:** Introduction of this course; Objective of the course**Week 2:** Analysis of simple non-linear circuits (each containing one transistor) and introducing the notion of signal amplification.**Week 3:** Amplifier models (equivalent circuits)**Week 4:** Frequency response of CE and CS amplifiers, High frequency models of BJT and MOSFET.**Week 5:** Common Collector (CC) and Common Drain (CD) amplifiers; Common Base (CB) and Common Gate (CG) amplifier**Week 6:** Multi transistor Amplifiers (operation and analysis)**Week 7:** Single-ended signaling vs. differential signaling**Week 8:** Current mirror- operation and analysis**Week 9:** Feedback**Week 10:** Oscillation in feedback system and oscillation criterion**Week 11:** Oscillator: Sinusoidal-Phase-shift and LC; Comparator, Square wave generator**Week 12:** Power efficiency of an amplifier