Course Title: Analog Circuits

Credit Structure (L-T-P-Cr): (3-0-3-4.5)

Course Code: EL213

Prerequisites (if any)/desired skill set: Basic electronics

Course objective: This course introduces the characteristics and applications of semiconductor devices and circuits. Emphasis is placed on analysis, selection, biasing, and applications. Upon completion, students should be able to construct, analyse, verify, and troubleshoot analog circuits using appropriate techniques and test equipment.

Course content:
1. Introduction to Semiconductor Physics: A. N-type and P-type materials, electron and hole currents, PN junction and biasing
2. Diode Circuit Analysis: Diode model, Clipper and clamper circuits, Zener diodes and LED
3. Bipolar Junction Transistors: Transistor physics, NPN and PNP types, transistor ratings and specifications, transistor testing,
4. Transistor Amplifier Circuits: DC biasing, practical biasing circuits, BJT transistor amplifier configurations of common-emitter, -collector, and –base, equivalent circuit models, gain and impedance, troubleshooting common emitter amplifiers
5. Feedback amplifier: Designing of negative feedback amplifiers, voltage series, voltage shunt, current series and current shunt, stability analysis, unity-gain frequency of amplifier, phase-margin, compensation in multi-stage amplifiers
6. Differential amplifiers, Mono stable, a stable and bi-stable mutivibrators

Labs: Consists of hardware and software based practical based on above content.

Project: Application based project conducted to get more insight and develop skills like designing, soldering, troubleshooting of circuits.

Suggested textbook/references: