GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

Electronics Engineering

Subject Code 141101
Subject Name Advance Electronics

Sr.No	Course content
1.	Transistor at High Frequencies: Hybrid –pi CE Transistor Model, Hybrid –pi Conductances, Hybrid –pi Capacitances, Validity of Hybrid –pi Model, Variation of Hybrid –pi Parameters, CE Short-Circuit Current Gain, Current Gain with Resistive Load, Single-Stage CE Transistor Amplifier Response, Gain-Bandwidth Product, Emitter Follower at High Frequencies
2.	Multistage Amplifiers: Classification of Amplifiers, Distortion in Amplifiers, Frequency Response of an Amplifier, Bode Plots, Step Response of an Amplifier, Bandpass of Cascaded Stages, RC Coupled Amplifier, Low Frequency Response of an RC Coupled Stage, Effect of an Emitter Bypass Capacitor on Low-Frequency Response, High-Frequency Response of Two Cascaded CE Transistor Stages, Multistage CE Amplifier Cascade at High Frequencies
3.	Feedback Amplifiers: Classification of Amplifiers, Feedback Concept, Transfer Gain with Feedback, General Characteristics of Negative Feedback Amplifiers, Input Resistance, Output Resistance, Method of Analysis of a Feedback Amplifier, Voltage Series Feedback, A Voltage Series Feedback Pair, Current Series Feedback, Current Shunt Feedback, Voltage Shunt Feedback
4.	Stability and Oscillators: Effect of Feedback on Amplifier Bandwidth, Double-Pole Transfer Function with Feedback, Three –Pole Transfer Function with Feedback, Approximate Analysis of a Multipole Feedback Amplifier, Stability, Gain and Phase Margins, Compensation, Dominant-Pole Compensation, Pole-Zero Compensation, Compensation by Modification of the β Network, Sinusoidal Oscillators, Phase-Shift Oscillator, Resonant Circuit Oscillators, A General Form of Oscillator Circuit, Wien Bridge Oscillator, Crystal Oscillators, Frequency Stability
5.	Operational Amplifiers: Basic Operational Amplifier, Differential Amplifier, Emitter-Coupled Differential Amplifier, Transfer Characteristics of a Differential Amplifier, An Example of an IC Operational Amplifier, Offset Error Voltages and Currents, Temperature Drift of Input Offset Voltage and Current, Measurement of Operational Amplifier Parameters, Frequency Response of Operational Amplifiers, Dominant –Pole Compensation, Pole-Zero Compensation, Lead Compensation, Step Response of Operational Amplifiers

6.	Logic Families : Diode Transistor Logic, High Threshold Logic, Transistor Transistor Logic, Resistor Transistor Logic, Direct Coupled Transistor Logic, Comparison of Logic families.
7.	Analog To Digital And Digital To Analog Converters: Digital to Analog Conversion, R-2R ladder type DAC, Weighted resistor type DAC, Switched current source type DAC, Switched capacitor type DAC, Analog to Digital Conversion, Counter type A/D converter, , Flash-type A/D converter, Dual slope A/D converter, Successive approximation ADC.

Reference Books:

1. Integrated Electronics By Jacob Millman and Christos C. Halkias, Tata McGraw Hill Publication
2. Electronic Devices and Circuit Theory by Robert Boylestad and Louis Nashelsky [Ninth Edition]