DEPARTMENT CORE COURSE-9 (DCC)
EC210- ANALOG ELECTRONICS – II

Details of course: -

Course Title	Course Structure			Pre-Requisite
	L	T	P	
Analog Electronics – II	3	0	2	Knowledge of semiconductor devices (BJT, MOSFET)

Course Objective:
To familiarize students to the analysis and design of analog electronic circuits which form the basic building blocks of almost any electronic system.

Course Outcome (CO):

1. EC202.1 Identify the high frequency limitations of BJTs and MOSFETs and determine frequency response of single and multistage amplifiers.
2. EC202.2 Explain the concept of and analyze the performance of negative feedback circuits.
3. EC202. Describe the concept of positive feedback and criterion for oscillations, analyses and design different BJT oscillators and Crystal oscillator.
4. EC202.4 Differentiate between the voltage, current and power amplifier and design the power amplifiers for required applications.
5. EC202.5 Explain the concept of differential amplifiers and current mirrors
6. EC202.6 Design, construct and take measurement of various analog circuits and compare experimental results in the laboratory with theoretical analysis.

S. No.	Content	Contact Hours
Unit 1	Frequency Response: s-Domain analysis: Poles, Zeros, and Bode plots, the amplifier transfer function, Low-frequency/ high-frequency response of common-source/common emitter amplifiers, common base/ common-gate amplifier, frequency-response of emitter and source follower.	8
Unit 2	Frequency response of cascaded stages: Cascode configurations, the common-collector and common emitter cascade, frequency response of the differential amplifier. SPICE simulation example.	8
Unit 3	Feedback: Properties of feedback amplifiers, basic feedback topologies, analysis and characteristics of various feedback amplifier circuits. Loop gain, stability problem, effect of feedback on the amplifier poles, stability study using bode plots, frequency compensation.	10
Unit 4	Principles of oscillations, Barkhausen criterion, Frequency stability, Various types of oscillators: RC Phase shift, Wein bridge, Hartley, Colpitt, Crystal oscillators. Amplitude limiter circuits. Output stage and Power Amplifiers: Classification of output stages, class A, B and AB output stages, Biasing the class AB circuit, variations on the class AB configuration, Power BJTs,	10

	MOS power transistors, IC power amplifiers.	
Unit 5	Review of current mirrors, large and small signal analysis of BJT and MOSFET based differential amplifiers.	6
	Total	42

Books:-

S. No	Name of Books/Authors/Publisher
1	Microelectronics circuits by Sedra and Smith; Oxford university press, 1982, 5th edition
2	Fundamentals of Microelectronics circuits by B. Razavi, 2012, 3rd edition
3	Microelectronics by Millman and Grabel; Tata McGraw Hill, 1987, 2nd edition
4	Electronic Devices and Circuits by B Kumar and Shail Bala Jain, PHI, 2007, 2nd edition
5	Microelectronics circuits by Rashid, PWS Publishing Company, 2000, 2nd edition