Syllabus

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	TOTAL
23EC309	Professional Core	3	0	0	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes:48		

Course Objectives:

- To introduce components such as diodes, BJTs and FETs their switchingcharacteristics, applications.
- Learn the concepts of high frequency analysis of transistors.
- To give understanding of various types of basic and feedback amplifier circuitssuch as small signal, cascaded, large signal and tuned amplifiers.
- To introduce the basic building blocks of linear integrated circuits.
- To introduce the concepts of waveform generation and introduce some specialfunction ICs.

Course Outcomes: At the end of this course, students will demonstrate the ability to

- Know the characteristics, utilization of various components.
- Understand the biasing techniques.
- Design and analyze various rectifiers, small signal amplifier circuits.
- Design sinusoidal and non-sinusoidal oscillators.
- A thorough understanding, functioning of OP-AMP, designs OP-AMP basedcircuits with linear integrated circuits.

UNIT-I:

Diode and Bipolar Transistor Circuits: P-N junction diode, I-V characteristics of a diode; review of half-wave and full-wave rectifiers, clamping and clipping circuits. Input output characteristics of BJT in CB, CE, CC configurations, biasing circuits, Load line analysis, common-emitter, common-base and common collector amplifiers; Small signal equivalent circuits

UNIT-II:

FET Circuits: FET Structure and VI Characteristics, MOSFET structure and I-V characteristics.MOSFETasaswitch.smallsignalequivalentcircuits-gain,input and output impedances, small-signal model and common-source, common-gate and common- drain amplifiers, trans conductance, high frequency equivalent circuit.

UNIT-III:

Multi-Stage and Power Amplifiers: Direct coupled and RC Coupled multi-stage amplifiers; Differential Amplifiers, Power amplifiers- Class A, Class B, Class C

UNIT-IV:

Feedback Amplifiers : Concepts of feedback– Classification of feedback amplifiers– General characteristics of Negative feedback amplifiers – Effect of Feedback on Amplifier characteristics –Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations – Simple problems.

Oscillators: Condition for Oscillations, RC type Oscillators-RC phase shift and Wien- bridge Oscillators, LC type Oscillators–Generalized analysis of LC Oscillators, Hartley and Colpitts Oscillators.

UNIT-V:

Operational Amplifiers: Ideal op-amp, Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product, Inverting and non-inverting amplifier, Differentiator, integrator, Square-wave and triangular-wave generators.

TEXT BOOKS:

1. Integrated Electronics, Jacob Millman, Christos CHalkias, McGraw HillEducation, 2nd edition 2010
2. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 2003.

REFERENCE BOOKS:

1. Electronic Devices Conventional and current version-Thomas L. Floyd 2015,pearson.
2. J.Millmanand A.Grabel, "Microelectronics", Mc Graw Hill Education,1988.
3. P.Horowitz and W.Hill, "The Art of Electronics", Cambridge University Press,1989.
4. P. R.Gray, R. G. Meyerand S. Lewis, "Analysis and Design of Analog IntegratedCircuits", John Wiley & Sons, 2001.