

Learning Outcomes:

The educational objectives of the course are to educate students to attain the following:

- Getting familiarized with basic integrated circuit components, its designing & packaging
- Understanding various operating modes of Op-amp and its linear/non-linear applications
- Designing of signal generators and low and high order filters
- Understanding and designing of multi-vibrator and power supply circuits

SYLLABUS

Unit No.	Topics	Lectures (Hours)
	Introduction to the overview and importance of the course.	
1	Integrated Circuits: Types, Package type, Pin identification, Temperature range, Scale of integration, Analog and Digital ICs difference, Advantages of ICs.	4
2	OP-AMP Basics: Basic differential amplifier emitter coupled circuits, Basic block diagram, Ideal OP-AMP with transfer curve, Pin diagram, Equivalent circuit, Open loop configurations and Closed loop configuration: Inverting & Non-inverting and Differential modes.	6
3	OP AMP Performance Parameters: Introduction , input offset voltage , input bias current , input offset current , total output offset voltage , thermal drift , effect of variation in power supply voltage on offset voltage , common mode configuration and common mode rejection ratio , offset nulling techniques.	5
4	General Applications: Summing, averaging, Instrumentation amplifier, Inverter, Voltage follower, V to I and I to V converters, Integrator, Differentiator, Sample & hold circuits, Differentiators and Integrators, Basic Comparators, Schmitt trigger, zero-crossing detector, Peak detector.	8
5	Active Filters And Signal Generators: Types of filters, Butterworth filters – Low Pass, High Pass, Band pass, Notch filter, Designing of 1 st and 2 nd order filters, All Pass filter. Generators: Sine Wave, Square wave, Triangular Wave and Sawtooth Wave generators, Voltage controlled Oscillator.	9
6	Timers: Introduction to 555 timer, pin diagram, Monostable and Astable operations with application.	4
7	Voltage Regulators: Three terminal monolithic voltage regulator ICs 78XX and 79XX series. Circuits of $\pm 5V$ and $\pm 15V$ power supply using voltage regulator ICs., Switching Mode Power Supply (SMPS).	4

Term Work and Practical shall be based on the above syllabus.

Text Books:

1. Op Amp and Linear Integrated Circuits. By – RamakantGayakwad

Reference Books:

1. Operational Amplifiers: Design & Applications. By – Driscoll and Coughlin
2. Op Amp & Linear Integrated Circuit. By – James M.Fiore
3. Operational Amplifiers & Linear Integrated Circuits. By – K. Lal Kishore
4. Op-amps and Linear Integrated Circuits. By – Robert F. Woghlin& Frederick F. Driscoll
5. Analog Electronic Circuits. By – Lakmi Jain & Swash Hungenehally