| 5th Semester | REC5D004 | Advance Electronics Circuits | L-T-P 3-0-0 | 3Credits |
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**Module-I:** **(10 Hours)**

**Active Filters** :Active Filters, Frequency response of Major Active filters, First order low-pass Butterworth filter: Filter Design, Frequency Scaling, Second-order low- pass Butterworth filter: First- order high-pass Butterworth filter, Second-order high- pass Butterworth filter, Band-pass filters: Wide band-pass Filter, Narrow Band-Pass Filter, Band-reject filters: Wide Band-Reject Filter, Narrow Band- Reject Filter, All- Pass filter.

**Oscillators:** Oscillators: Oscillator Principles, Oscillator Types, Quadrature Oscillator, Saw tooth wave generator, Voltage-controlled oscillator.

**Comparators:** Comparators: basic comparator, zero-crossing detector, Schmitt trigger, comparator characteristics, limitations of Op-Amp as comparators, voltage limiters.

**Module-II:** **(10 Hours)**

**Bistable Multivibrator:** Bistable Multivibrator, fixed-bias bistable multi vibrator, Loading, self-biased transistor binary, commutating capacitors, Triggering the binary, Unsymmetrical Triggering of the bistable multivibrator, Triggering Un symmetrically through a Unilateral Device, Triggering, Triggering of a Bistable Multi Symmetrically without the Use of Auxiliary Symmetrical Diodes, Schmitt Trigger Circuit (Emitter-coupled Bistable Multivibrator

**Monostable and Astable Multivibrator:** Monostable Multivibrator, Gate width of a Collector-Coupled Monostable Multivibrator, wave form of the Collector-Coupled Monostable Multivibrator, Emitter -Coupled Monostable Multivibrator, triggering of the Monostable Multivibrator, Astable Collector-Coupled Multivibrator, Emitter -Coupled Astable Multivibrator

**Wideband amplifiers**: Wideband amplifiers: The Hybrid-π, High-frequency, Small- signal, Common- emitter Model, RC-Coupled Amplifier, Frequency Response of a Transistor Stage-The Short-Circuit Current Gain, Current Gain with Resistive Load, Transistor Amplifier Response taking Source Impedance into Account, Transient Response of a Transistor Stage.

**Module-III:** **(10 Hours)**

**Negative Resistance Switching Devices:** Voltage Controllable Negative resistance devices, Tunnel Diode operation and characteristics, Monostable Astable, Bistable circuits using tunnel diode, Voltage controlled Negative Resistance Switching Circuits.

**Voltage and Current Time Base Generators:** Time-Base Generators, General features of a Time- base signal, Methods of generating a voltage time-base waveform, Exponential sweep circuit, Miller and bootstrap time base generators-Basic principles, Transistor miller time base generator, Transistor bootstrap time base generator, Current Time-Base Generators, A Simple Current sweep, Linearity Correction through adjustment of driving waveform, Transistor current time base generator.

**Module IV** **(10 Hours)**

**Specialized IC Applications:** IC 555 Timer: IC 555 Timer as a Monostable Multivibrator and its applications, IC 555 Timer as Astable Multivibrator and its applications. Phase Locked Loop: Operating principle of PLL, Phase detectors, Exclusive-OR phase detector, Monolithic phase detector, Instrumentation Amplifier and its applications.

**Module V**

Cascaded CE Transistor Stages, Rise-time Response of Cascaded Stages, Shunt Compensation of a Transistor Stage in a Cascade, Rise Time of Cascaded Compensated Stages, Low frequency Compensation.

**Books:**

[1] Pulse, Digital and switching Waveforms, Jacob Millman, Herbert Taub and MS Prakash Rao, TMH Publication, Second Edition.
[2] Pulse, Switching and Digital Circuits,David A. Bell, Oxford University Press, Fifth Edition.
[3] OP-Amps and Linear Integrated Circuits, Ramakant A. Gayakwad, PHI Publication.
[4] Pulse & Digital Circuits, K.Venkata Rao, K Rama Sudha& G Manmadha Rao, Pearson Education, 2010.
[5] OP-Amps and Linear Integrated Circuits, Robert F. Coughlin, Frederick F. Driscoll, Pearson Education Publication.
[6] Pulse and Digital Circuits**,** A. Anand Kumar, PHI.