2/4 B.Tech - FOURTH SEMESTER

EC4T2 **Pulse & Digital Circuits** **Credits: 4**

Lecture : 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Course Objectives:

- To Introduce the students the wave shaping circuits, Switching Characteristics of diode and transistor
- To analyze different types of Multi vibrators and their design procedures.
- To Introduce Time-base Generators and Principles of Synchronization & Frequency division.
- To Understand Sampling Gates and to Design NAND and NOR gates using various logic families.

UNIT- I

Linear wave shaping: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, double differentiation circuit.

UNIT- II

Non – Linear Wave Shaping : Diode clippers: Series and Shunt, Emitter coupled clipper, Transfer characteristics of clippers, Comparators, clamping operation, Positive and Negative clampers, biased clampers, Clamping circuit theorem, Transfer characteristics of clampers.

UNIT- III

Switching Characteristics of Devices: Diode and Transistor as switches, transistor-switching times Break down voltage consideration of transistor, Design of transistor switch.

UNIT- IV

Analysis and Design of Bistable Multivibrators : Analysis and Design of Fixed bias transistor binary, Commutating capacitors, Triggering circuits , Non saturating Binary, Schmitt trigger circuit and its Applications

UNIT- V

Analysis and design of Monostable, Astable Multivibrator: Analysis and design of Monostable multivibrators (Collector-coupled and Emitter-coupled) using transistors, Analysis and design of Astable multivibrator (Collector coupled and Emitter-coupled) using transistors.

UNIT- VI

Time Base Generators: General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators ,Current time base generators.

UNIT- VII

Synchronization and Frequency Division : Principles of Synchronization, Frequency division in sweep circuit, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

UNIT- VIII

Sampling Gates and Realization of Logic Gates: Sampling gates; Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates.Realization of NAND and NOR Logic Gates using DTL, TTL,CMOS logic circuits ,Comparison of logic families

Learning Resources

Text Books:

1. Pulse Digital and Switching Waveforms, J. Millman and H. Taub, McGraw-Hill, 2nd Edition 1991.
2. Pulse and Digital Circuits, A. Anand Kumar, PHI,.2nd Edition, 2005

References:

1. Digital Logic State MachiDesign, David J.Comer Oxford University Press, ,3rd Edition,2008
2. Introduction To System Design Using Integrated Circuits , B S **Sonde ,** New Age International,2nd ed., 1992