Prasad V. Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada.

Department of ECM **PVP12**

2/4 B.Tech. FOURTH SEMESTER

EM4T1 **PULSE AND DIGITAL CIRCUITS** **Credits: 4**

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

Course Objective
- To familiarize the student with the Pulse and digital circuits.
- To understand the concepts of wave shaping and wave generation circuits
- Design and analyze various circuits for any application.

Learning outcomes

- To understand the concepts of wave shaping circuits.
- Design and analyze various circuits for any application.

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 & Shunt, Emitter coupled clipper, Transfer characteristics of clippers, Comparators, clamping operation, Positive & 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 & Design of Bistable Multivibrators : Analysis & Design of Fixed bias transistor binary, Commutating capacitors, Triggering circuits , Non saturating Binary, Schmitt trigger circuit and its Applications

UNIT- V
Analysis & design of Monostable, Astable Multivibrator: Analysis & design of Monostable multivibrators (Collector-coupled and Emitter-coupled) using transistors, Analysis & 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 & Realization of Logic Gates: Sampling gates, Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Realization of NAND & NOR Logic Gates using DTL, TTL,CMOS logic circuits ,Comparison of logic families.

Learning resources

Text Books :
 1. J. Millman and H. Taub, "Pulse Digital and Switching Waveforms",McGraw-Hill, 1991.

References :
 1. A. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.Second Edition
 2. David J.Comer,"Digital Logic   State MachiDesign', Oxford University Press, ,Third Edition,2008