**20EE31E3 – PULSE AND DIGITAL CIRCUITS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course category:** | Professional Elective | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3 - 0 - 0 |
| **Pre-requisite:** | Knowledge in active & passive components and mathematical representation of different waves. | **Sessional Evaluation :****External Evaluation:****Total Marks:** | 4060100 |

|  |  |
| --- | --- |
| **Course****Objectives** | Students undergoing this course are expected to understand: |
| 1. Design of wave shaping circuits.
2. Functioning of Switching Circuits.
3. Concept of multi-vibrators.
4. Principle and operation of time base generators.
5. various Power Amplifiers and their operation
6. LC tuned amplifiers.
 |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: |
| CO1 | Design RC circuits for triggering |
| CO2 | Understand Switching circuits (BJT Inverter, NMOS, PMOS and CMOS switching circuits) |
| CO3 | Design a Multi-vibrator and Schmitt trigger |
| CO4 | Analyse Voltage/ Current Sweep Circuits |
| CO5 | Categorize Power Amplifiers and understand the essence |
| CO6 | Understand principle and operation of a Tuned amplifiers |
| **Course****Content** | **UNIT-I****WAVE SHAPING CIRCUITS**: Types of waveforms, RC low pass and high pass circuits, rise time, tilt.**UNIT-II****REVIEW OF SWITCHING CIRCUITS**: Diode as a switch,BJT as a switch and switching times, Diode clippers and clampers. **UNIT-III****MULTIVIBRATORS:** Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors, triggering methods.**UNIT-IV****TIME BASE GENERATORS:** RC sweep circuits, constant current Miller and Bootstrap time base generators using BJT’s and UJT relaxation oscillator.**UNIT-V****TUNED AMPLIFIERS:** Introduction, Q-factor, small signal tuned amplifiers, effect of cascading single tuned amplifier on bandwidth and stagger-tuned amplifiers. **UNIT-VI****POWER AMPLIFIERS:** Classification of Power Amplifiers, Class-A, Transformer coupled Class-A, cross over distortion, Class-B push-pull amplifier, Distortions in amplifiers. |
| **Text Books &****Reference Books** | **TEXT BOOKS:**1. “Pulse & Digital switching waveforms” by J. Milliman& H. Taub McGraw-Hill, 3rd edition 2017.
2. Millman and Halkias,”Integrated Electronics”, McGraw-Hill Co 2nd Ed, 2017.

**REFERENCE BOOKS:**1. Solid State Pulse Circuits, by David A. Bell, PHI.4th edition 2008.
2. Boylestad, Louis Nashelsky “Electronic devices and circuits” 11th ed., 2012 PH.
 |
| **E-Resources** | 1. http://nptel.ac.in/cources
2. https:// iete-elan.ac.in
3. <https://freevideolectures.com/university/iit>
 |