**19EC3103 – PULSE & DIGITAL CIRCUITS**

**(EEE)**

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| **Course Category:** | Professional core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture-Tutorial-Practical:** | 3-0-0 |
| **Pre-requisite:** | Knowledge in active & passive components and mathematical representation of different wave shapes. | **Sessional Evaluation:**  **External Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **Course Objectives:** | Students undergoing this course are expected to :   1. Analysis and design of wave shaping circuits. 2. Analysis and design of Switching Circuits. 3. Analysis and design of multi-vibrators. 4. Analysis and design of time base generators. 5. Analysis of Power Amplifiers. 6. Analysis of LC tuned amplifiers. | |
| **Course Outcomes:** | Upon successful completion of the course , the students will able to: | |
| CO1 | Design RC circuits for triggering |
| CO2 | Understand Switching circuits ( BJT Inverter, NMOS, PMOS and CMOS Switching circuits) |
| CO3 | Understand design of Multi-vibrators and Schmitt trigger |
| CO4 | Understand Voltage/ Current Sweep Circuits |
| CO5 | Understand Power Amplifiers |
| CO6 | Understand Tuned amplifiers |
| **Course Content:** | **UNIT – I**  **Wave Shaping Circuits**: Types of waveforms, RC low pass and high pass circuits, rise time, tilt, Diode as a switch, Diode clipper and clamper circuits.  **UNIT – II**  **Review Of Switching Circuits:** BJT Inverter, NMOS, PMOS and CMOS Switching circuits and their implementation (universal gates only).  **UNIT-III**  **Multi-Vibrators:** BJT switch and switching times, Bi-stable multivibrator & triggering methods, Schmitt-trigger, Mono-stable and Astable multi-vibrators using BJT.  **UNIT – IV**  **Time Base Circuits:** RC sweep circuits, constant current Miller and Bootstrap time base generators using BJT’s, UJT relaxation oscillators, and sampling gates.  **UNIT – V**  **Power Amplifiers:** Classification of Power Amplifiers, Class-A, Transformer coupled Class-A, Class-B Push-pull, Complementary Class-B push-pull amplifiers.  **Sinusoidal Oscillators:** Barkhausen criterion, RC Phase Shift, Wien Bridge, Hartley and Colpitts oscillators, Crystal oscillator.  **UNIT –VI**  **Tuned Amplifiers:** Introduction, Q-factor, small signal tuned amplifiers, effect of cascading single tuned amplifier on bandwidth and stagger-tuned amplifiers. | |
| **Text Books & Reference Books:** | **Text Books:**   1. “Pulse & Digital switching waveforms” by J.Milliman & H.Taub Mc Graw-Hill,2nd Edition 2008. 2. Design of analog CMOS Integrated circuits by Behad razhavi, Mc Graw-Hill, 2nd Edition 2001.   **Reference Books:**   1. Solid State pulse circuits, by David A. Bell, PHI.4th Edition 2008. 2. Electronic devices and circuit thoery by Boylestad, Louis Nashelsky, 9ed.,2008Pearson Education 3. Millman and Halkian “Integrated Electronics”, McGraw-Hill. | |
| **E-Resources:** | http://nptel.ac.in/cources  https:// iete-elan.ac.in  https://freevideolectures.com/university/iitm  https://www.youtube.com/watch?v=aO6tA1z933k  <https://www.youtube.com/watch?v=wN6g_q3KPtw>  https://www.youtube.com/watch?v=x0BZeUACpK0 | |