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| Course No | Course Name | L-T-P-Credits |
| **EE 201** | **Analog Electronics** | **3-1-0: 4** |
|  Prerequisite: nil; Co requisite: nil |
| **Course Objectives**:1. To understand the basic of analog circuits, its design and various applications  |
|  **SYLLABUS** |
| **Module** | **Contents** | **Hours** |
| I | **Fundamental of Analog Electronic Devices**:Solid state device fundamentals, BJT and FET configuration and analysis**,** bypass and coupling capacitors, biasing methods, stability, common base configuration analysis, emitter follower, common source amplifier, frequency response of BJT and FET amplifiers. Introduction of audio frequency power amplifier; class A, B, AB and C operation, class A common-emitter power amplifier, transformer coupled amplifier, class B push-pull power amplifier, amplifiers using complementary symmetry | 12 |
| II | **Operational Amplifier:**Introduction of op-amp,operational amplifier configuration, block diagram representation, schematic symbol, ICs and manufacturers designations, device identification, open-loop op-amp configuration, op-amp negative feedback, series-and-shunt configurations, difference amplifiers, offset analysis, common mode and differential mode gains, CMRR, compensating network, frequency response of compensated and non-compensated op-amp, slew rate, frequency response, GBW product, phase margin, biasing technique, error compensation | 15 |
| III | **Linear Applications:** DC and AC amplifiers, peak amplifier, summing, scaling and averaging amplifiers, instrumentation amplifier, voltage-to-current converter, current-to-voltage converter, integrator and differentiator circuits | 07 |
| IV | **Filters and Oscillators:**Active filters design, high order filter, low pass, band pass, high pass, and band reject filters, and all pass filter, oscillators, phase shift oscillator, and Wien bridge oscillators, quadrature oscillator, square, triangular and saw tooth wave generators, voltage controlled oscillator | 07 |
| V | **Comparators and Converters:**Zero-crossing detector,schmitt trigger, voltage limiters and window detector, voltage-to-frequency and frequency-to-voltage converters, analog-to-digital and digital-to-analog converters, clippers, clampers, peak detector, sample-and-hold circuit. The 555 timer, phase-locked loop, power amplifier, voltage regulators and application, audio function generator | 07 |

**Essential Readings:**

1. Sedra and Smith, “Microelectronic Circuits”, Oxford University Press, 5th Edition, 2004.
2. Gayakwad Ramakant, “Op-Amps and Linear Integrated Circuits”, PHI, 4th Edition, 2002.
3. Robert L. Boylestad, “Electronic Devices and Circuit Theory,” Pearson, 10th Edition, 2009

**Supplementary Readings:**

1. Jacob Millman and C. C. Halkias, “Integrated Electronics: Analog and Digital Circuits and Systems,” McGraw-Hill Kogakusha, 2nd Edition, 2011.
2. P. Gray, P. Hurst, S. Lewis, and R. Meyer, “Analysis & Design of Analog Integrated Circuits,” Wiley, 4th Edition, 2001.