**23EC2202-ELECTRONIC CIRCUITS ANALYSIS**

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| **CourseCategory:** | | ProgramCore | | **Credits:** | 3 |
| **CourseType:** | | Theory | | **Lecture-Tutorial-Practical:** | 3-0-0 |
| **Prerequisite:** | | Electronic Devices and Circuits | | **SessionalEvaluation:ExternalEvaluation:**  **TotalMarks:** | 30  70  100 |
| **CourseObjectives** | Students under going this course are expected to: | | | | |
| 1. Understand the characteristics of Differential amplifiers, feedback and power amplifiers. 2. Analyze the response of tuned amplifiers 3. Categorize different oscillator circuits based on the application 4. Design the electronic circuits for the given specifications and for a given application. | | | | |
| **CourseOutcomes** | At the end of this course the student will be able to: | | | | |
| CO1 | | Understand the characteristics of differential amplifiers ,feedback and power  amplifiers.(L2) | | |
| CO2 | | Examine the frequency response of multistage and differential amplifier circuits  Using BJT & MOSFETs at low and high frequencies.(L3) | | |
| CO3 | | Investigate different feedback and power amplifier circuits based on the application.(L4) | | |
| CO4 | | Derive the expressions for frequency of oscillation and condition for oscillation of  R C and L C oscillator circuits.(L4) | | |
| CO5 | | Evaluate the performance of different tuned amplifiers(L5) | | |
| **CourseContent** | **UNITI**  **Multistage & Differential Amplifiers :**Introduction ,Classification of Amplifiers ,Distortion in amplifiers, Coupling Schemes, RC Coupled Amplifier using BJT, Cascaded RC Coupled BJT Amplifiers, Cascade amplifier, Darlington pair, the MOS Differential Pair, Small-Signal Operation of the MOS Differential Pair, The BJT Differential Pair, and other Non-ideal Characteristics of the Differential Amplifier.  **UNITII**  **Frequency Response:** Low-Frequency Response of the CS and CE Amplifiers, Internal Capacitive Effects and the High-Frequency Model of the MOSFET and the BJT, High-Frequency Response of the CE, Emitter follower, CS, CD, fβ, fT and gain bandwidth product.  **UNITIII**  **Feedback Amplifiers:** Introduction, The General Feedback Structure, Some Properties of Negative Feedback ,The Four Basic Feedback Topologies ,Series-Shunt, Series-Series ,Shunt-Shunt ,Shunt-Series.  **Oscillators:** General Considerations, Phase Shift Oscillator, Wien-Bridge Oscillator, LC Oscillators ,Relaxation Oscillator, Crystal Oscillators, Illustrative Problems. | | | | |

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|  | **UNITIV**  **Power Amplifiers:** Introduction, Class A amplifiers (Series fed, Transformer coupled ,Push pull), Second Harmonic distortion, Class B amplifiers (Push pull, Complementary symmetry), Crossover distortion and Class AB operation, Class C amplifiers, Power BJTs, MOS power transistors.  **UNITV**  **Tuned Amplifiers**: Introduction, single Tuned Amplifiers–Q-factor,frequency response, Double Tuned Amplifiers – Q-factor, frequency response, Concept of stagger tuning and synchronous tuning.  **Multivibrators:** Analysis and Design of Bi-stable, Mono-stable, Astable Multivibrators and Schmitt trigger using Transistors. |
| **Text BooksandReferenceBooks** | **Textbooks:**   1. Adel. S. Sedra and Kenneth C. Smith, “Micro Electronic Circuits,” 6th Edition,OxfordUniversityPress,2011. 2. J.Millman,H.TaubandMothikiS.PrakashRao-Pulse,DigitalandSwitchingWaveforms- 2ndEd.,TMH,2008. 3. Millman,CChalkias,“IntegratedElectronics”,4thEdition,McGrawHillEducation(India)PrivateLtd.,2015.   **References:**   1. BehzadRazavi,“FundamentalsofMicroElectronics”,Wiley, 2010. 2. DonaldANeamen,“ElectronicCircuits– AnalysisandDesign,”3rdEdition,McGrawHill(India),2019. 3. RobertL.BoylestadandLouisNashelsky,“ElectronicDevicesandCircuits   Theory”,9thEdition,Pearson/Prentice Hall,2006. |

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| Contribution of Course Outcomes towards achievement of Program Outcomes (3-High, 2-Medium, 1-Low) | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO3 | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| CO5 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |