## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Regulation : R16** **BATCH : 2018-22**

**LIST OF COURSE OUTCOMES DEFINED FOR A BATCH - 2018-22**

| S.No | Regulation | Course Code | YEAR/ SEM | Name of the Course | No. of COs Defined |
|---|---|---|---|---|---|
| 1 | R16 | C201 | II-I | Managerial Economics & Financial Analysis | 6 |
| 2 | R16 | C202 | II-I | Electronic Devices and Circuits | 5 |
| 3 | R16 | C203 | II-I | Switching Theory and Logic Design | 5 |
| 4 | R16 | C204 | II-I | Signals & Systems | 4 |
| 5 | R16 | C205 | II-I | Network Analysis | 5 |
| 6 | R16 | C206 | II-I | Random variables & Stochastic Processes | 6 |
| 7 | R16 | C207 | II-I | Electronic Devices & circuits Lab | 4 |
| 8 | R16 | C208 | II-I | Network Analysis Lab | 5 |
| 9 | R16 | C209 | II-II | Management Science | 6 |
| 10 | R16 | C210 | II-II | Electronic Circuit Analysis | 5 |
| 11 | R16 | C211 | II-II | Linear Control Systems | 5 |
| 12 | R16 | C212 | II-II | Electroma-gnetic Waves and Transmission Lines | 5 |
| 13 | R16 | C213 | II-II | Analog Communications | 5 |
| 14 | R16 | C214 | II-II | Pulse and Digital circuits | 5 |
| 15 | R16 | C215 | II-II | Electronic Circuit Analysis - Lab | 4 |
| 16 | R16 | C216 | II-II | Analog Communications - Lab | 5 |
| 17 | R16 | C301 | III-I | Computer Architecture and Organization | 5 |
| 18 | R16 | C302 | III-I | Linear Integrated Circuits and Applications | 5 |
| 19 | R16 | C303 | III-I | Digital IC Applications | 5 |
| 20 | R16 | C304 | III-I | Digital Communications | 5 |
| 21 | R16 | C305 | III-I | Antenna & Wave Propagation | 5 |
| 22 | R16 | C306 | III-I | Professional ethics and human values | 6 |
| 23 | R16 | C307 | III-I | Pulse and Digital circuits Lab | 5 |
| 24 | R16 | C308 | III-I | Linear Integrated Circuits and Applications - Lab | 5 |
| 25 | R16 | C309 | III-I | Digital IC Applications Lab | 4 |
| 26 | R16 | C310 | III-II | Microprocessor and Microcontrollers | 5 |
| 27 | R16 | C311 | III-II | Micro Wave Engineering | 6 |
| 28 | R16 | C312 | III-II | VLSI | 5 |
| 29 | R16 | C313 | III-II | Digital Signal Processing | 5 |
| 30 | R16 | C314 | III-II | OOPs through JAVA | 5 |
| 31 | R16 | C315 | III-II | IPR Patents and Intellectual Properties | 6 |
| 32 | R16 | C316 | III-II | Microprocessor and Microcontrollers - Lab | 4 |

| | | | | | |
|---|---|---|---|---|---|
| 33 | R16 | C317 | III-II | VLSI Lab | 4 |
| 34 | R16 | C318 | III-II | Digital Communications Lab | 4 |
| 35 | R16 | C401 | IV-I | RADAR Engineering | 5 |
| 36 | R16 | C402 | IV-I | Digital Image Processing | 5 |
| 37 | R16 | C403 | IV-I | Computer Networks | 6 |
| 38 | R16 | C404 | IV-I | Optical Communications | 6 |
| 39 | R16 | C405 | IV-I | Electronic Switching Systems | 6 |
| 40 | R16 | C406 | IV-I | Embedded Systems | 5 |
| 41 | R16 | C407 | IV-I | MicroWave Lab | 6 |
| 42 | R16 | C408 | IV-I | DSP LAB | 4 |
| 43 | R16 | C409 | IV-II | Cellular and Mobile communications | 5 |
| 44 | R16 | C410 | IV-II | Electronic Measurement and Instrumentation | 5 |
| 45 | R16 | C411 | IV-II | Satellite Communications | 6 |
| 46 | R16 | C412 | IV-II | Wireless Sensor Networks | 6 |

**HOD**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**YEAR :** II **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Managerial Economics & Financial Analysis | C201.1 | Describe the concepts related to demand in economics | Apply |
| | C201.2 | Estimate the production function techniques with Cost Concepts | Analyze |
| | C201.3 | Explain the concept of price output relationship in different market structures | Apply |
| | C201.4 | Outline the different types of business organizations and provide a framework for analyzing money in its functions as a medium of exchange | Apply |
| | C201.5 | Prepare Financial Statements by using several accounting tools... | Analyze |
| | C201.6 | Evaluate various investment project proposals by using capital budgeting techniques | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C201.1 | 3 | 3 | | | | | | | 2 | | 3 | 2 | | |
| C201.2 | 3 | 3 | | | | | | | 2 | | 3 | 2 | | |
| C201.3 | 3 | 3 | | | | | | | 2 | | 3 | 2 | | |
| C201.4 | 3 | 3 | | | | | | | 2 | | 3 | 2 | | |
| C201.5 | 3 | 3 | | | | | | | 2 | 2 | 3 | 2 | | |
| C201.6 | 3 | 3 | | | | | | | 2 | 2 | 3 | 2 | | |
| AVG | 3 | 3 | | | | | | | 2 | 2 | 3 | 2 | | |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Electronic Devices and Circuits | C202.1 | Interpret the concepts of Semiconductor physics to understand various electronic devices. | Apply |
| | C202.2 | Demonstrate the construction, working principle and V-I characteristics of various Non linear devices. | Apply |
| | C202.3 | Compare different types of rectifiers with and without filters with relevant expressions. | Analyze |
| | C202.4 | Understand different Biasing and Stabilization methods for BJT and FET. | Understand |
| | C202.5 | Analyze amplifier circuits using small signal low frequency transistor model. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C202.1 | 3 | 2 | | | | | | | | | | | | 3 |
| C202.2 | 3 | 3 | | | | | | | | | | | | 3 |
| C202.3 | 3 | 3 | | | | | | | | | | | | 3 |
| C202.4 | | | | | | | | | | | | | | 3 |
| C202.5 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| AVG | 3 | 2.75 | 3 | | | | | | | | | | | 3 |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Switching Theory and Logic Design | C203.1 | Illustrate the importance of various number systems and to perform different arithmetic operations on them. | Apply |
| | C203.2 | Apply Boolean algebra postulates-map and tabulation methods to minimize Boolean functions | Apply |
| | C203.3 | Illustrate various combinational and sequential circuits used in digital systems. | Apply |
| | C203.4 | Design various PLDs such as ROMs, PALs, PLAs and PROMs | Anlayze |
| | C203.5 | Analyze different finite state machines using Meelay More machines. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C203.1 | 2 | 3 | 3 | | | | | | | | | | | 3 |
| C203.2 | 3 | 2 | 3 | 3 | | | | | | | | | | 3 |
| C203.3 | 3 | 3 | 3 | 3 | | | | | | | | | | 3 |
| C203.4 | 3 | 3 | 3 | 3 | | | | | | | | | | 3 |
| C203.5 | 2 | 2 | 3 | | | | | | | | | | | 3 |
| AVG | 2.6 | 2.6 | 3 | 3 | | | | | | | | | | 3 |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Signals & Systems** | C204.1 | Classify various types of signals and systems to illustrate their responses | Analyze |
| | C204.2 | Apply transformation methods to solve signals and differential equations. | Apply |
| | C204.3 | Analyze the sampling theorem to calculate nyquist rate | Analyze |
| | C204.4 | Analyze the linear systems in time and frequency domains. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C204.1 | 3 | 2 | 2 | | | | | | | | | | 3 | |
| C204.2 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C204.3 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C204.4 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C204 | 3 | 2.75 | 2.75 | | | | | | | | | | 3 | |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Random variables & Stochastic Processes** | C206.1 | Interpret the concepts of random variables and stochastic processes in real time applications | Apply |
| | C206.2 | Use the principle definitions, fundamental theorem and important relations in statistics | Apply |
| | C206.3 | Analyze the dependence structure between random variables using the joint CDF to derive marginal distributions and conditional probabilities, enabling informed decision-making in multivariate statistical models. | Analyze |
| | C206.4 | Apply the concepts of stationarity and wide-sense stationarity to analyze and model stochastic processes in real-world applications such as signal processing, communication systems, and time series forecasting. | Apply |
| | C206.5 | Apply the concepts of power spectral density and cross power spectral density to analyze and interpret the frequency characteristics of random processes | Apply |
| | C206.6 | Analyze linear systems with theory of stochastic processes | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C206.1 | 3 | 2 | 2 | 2 | | | | | | | | | 3 | |
| C206.2 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C206.3 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C206.4 | 2 | 2 | 2 | 2 | | | | | | | | | 3 | |
| C206.5 | 2 | 2 | 2 | 2 | | | | | | | | | 3 | |
| C205.6 | 3 | 2 | 2 | 2 | | | | | | | | | 3 | |
| C204 | 2.7 | 2.3 | 2.0 | 2.0 | | | | | | | | | 3.0 | |

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|---|---|---|---|
| NETWORK ANALYSIS | C205.1 | Solve Network Problem Using Mesh and Nodal Analysis | Apply |
| | C205.2 | Solve Ac Circuits with series/parallel Combination | Create |
| | C205.3 | Design resonant circuits for given Bandwidth | Create |
| | C205.4 | Analyze Different Network Theorems and Two port Network parameters | Create |
| | C205.5 | Compute the response of First order and second Order Network using Time Domain Analysis and laplace Transform Method | Create |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C205.1 | 3 | 2 | 1 | | | | | | | | | | 1 | |
| C205.2 | 3 | 2 | 1 | | | | | | | | | | 2 | |
| C205.3 | 2 | 3 | 2 | | 1 | | | | | | | | 3 | |
| C205.4 | 3 | 3 | 2 | | | | | | | | | | 3 | |
| C205.5 | 2 | 3 | | | 2 | | | | | | | | 2 | |
| AVG | 2.6 | 2.6 | 1.5 | | 1.5 | | | | | | | | 2.2 | |

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|---|---|---|---|
| **Electronic Devices & circuits LAB** | C207.1 | Identify and test the behavior of electronic components and study the operation of Function generator ,RPS and CRO etc. | Understand |
| | C207.2 | Analyze the V-I characteristics of different electronic devices such as diodes, transistors. | analyze |
| | C207.3 | Implement the Rectifier circuits using diodes and capacitor. | Apply |
| | C207.4 | Examine the amplification characteristics of a Transistor in CE, CC,CS configurations. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C207.1 | | | | | | | | 2 | 3 | | | | | 3 |
| C207.2 | 3 | 3 | 3 | | | | | 2 | 3 | | | | | 3 |
| C207.3 | 3 | 3 | 3 | | | | | 2 | 3 | | | | | 3 |
| C207.4 | 3 | 3 | 3 | | | | | 2 | 3 | | | | | 3 |
| C207 | 3 | 3 | 3 | | | | | 2 | 3 | | | | | 3 |

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|---|---|---|---|
| NA LAB | C208.1 | Apply network theorems to analyze the electrical network | Apply |
| | C208.2 | Analyze RLC circuits and understand resonance Frequency | Analyze |
| | C208.3 | Determine parameters of a given two-port network | apply |
| | C208.4 | Discuss the Magnetization characteristics of DC shunt Generator | Analyse |
| | C208.5 | Observe the speed control of DC Motor and performance of 3-phase induction motor | create |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C208.1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | | 1 |
| C208.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | | 1 |
| C208.3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | | 1 |
| C208.4 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | - | | 1 |
| C208.5 | 3 | - | 2 | 1 | - | - | - | - | - | - | - | - | | 1 |
| avg | 2.80 | 2.67 | 2.00 | 1.33 | | | | | | | | | | 1.00 |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| | C209.1 | Describe different concepts of management | Understand |
| | C209.2 | Apply Quality Control, Work-study principles in real life industry | Apply |
| | C209.3 | Differentiate between various recruitment and selection methods. And Compare different marketing strategies and their effectiveness. | Analyze |
| | C209.4 | Analyze different Project Management techniques | Analyze |
| | C209.5 | Design and evaluate different strategic management concepts | Evaluate |
| | C209.6 | Implement Strategic Management through contemporary management practices | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C209.1 | | | | | | | | | 3 | 2 | | 1 | | |
| C209.2 | | | | | | | | | 3 | 2 | | 1 | | |
| C209.3 | | | | | | | | | 3 | 2 | | 1 | | |
| C209.4 | | | | | | | | | 3 | 2 | | 1 | | |
| C209.5 | | | | | | | | | 3 | 2 | | 1 | | |
| C209.6 | | | | | | | | | 3 | 2 | | 1 | | |
| AVG | | | | | | | | | 3 | 2 | | 1 | | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Electronic Circuit Analysis | C210.1 | Analyze amplifier circuits using small signal high frequency transistor models. | Analyze |
| | C210.2 | Understand different types of multistage amplifiers and differential amplifier with its characteristics. | Understand |
| | C210.3 | Analyze the effect of feedback on the performance of feedback amplifiers and oscillators. | Analyze |
| | C210.4 | Compare various power amplifiers in terms of efficiency. | Analyze |
| | C210.5 | Distinguish single, double and staggered tuned amplifiers in terms of bandwidth. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C210.1 | 3 | 3 | 2 | | | | | | | | | | | 2 |
| C210.2 | | | | | | | | | | | | | | 2 |
| C210.3 | 3 | 3 | 2 | | | | | | | | | | | 2 |
| C210.4 | 3 | 3 | 2 | | | | | | | | | | | 2 |
| C210.5 | 3 | 2 | 2 | | | | | | | | | | | 2 |
| AVG | 3 | 2.75 | 2 | | | | | | | | | | | 2 |

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|---|---|---|---|
| **Linear Control Systems** | C211.1 | Clarify various control systems and analyze the effects of feedback on physical systems | Analyze |
| | C211.2 | Examine the transfer function and state-space models of physical and electrical systems to assess system stability, transient response, and dynamic performance in control engineering applications. | Analyze |
| | C211.3 | Interpret the time response of first and second-order systems, including steady-state behavior and error constants for different standard test signals, to evaluate system performance in control applications. | Analyze |
| | C211.4 | Examine the Time Response and Frequency response Stability using R-H criterion, Root Locus, Polar plots, Bode Plots and Nyquist Stability Criterion | Analyze |
| | C211.5 | Design a Lag, Lead, Lead-Lag Compensators and PID controllers for given Specifications and Analyze and solve linear equations, controllability and observability | An+alyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C211.1 | 3 | 3 | | | | | | | | | | | 3 | |
| C211.2 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C211.3 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C211.4 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C211.5 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| AVG | 3 | 3 | 2.75 | 2.5 | | | | | | | | | 3 | |

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|---|---|---|---|
| Electroma-gnetic Waves and Transmission Lines | C212.1 | **apply** mathematical concepts and fundamental electromagnetic laws to calculate the electric and magnetic fields in various physical scenarios. | Apply |
| | C212.2 | Apply Maxwell's equations to solve problems in Electromagnetic field theory. | Apply |
| | C212.3 | Analyze the propagation characteristics of EM waves in different media and types of polarization. | Analyze |
| | C212.4 | Evaluate reflection and refraction of EM waves propagated in normal & oblique incidences. | Evaluate |
| | C212.5 | Demonstrate the transmission line equivalent circuit, characteristics with various lengths. Measurement of length, distance and design of stubs using Smith Charts | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C212.1 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C212.2 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C212.3 | 3 | 3 | 2 | 3 | | | | | | | | | 3 | |
| C212.4 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C212.5 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| AVG | 3 | 3 | 2.2 | 2.4 | | | | | | | | | 3 | |

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|---|---|---|---|
| Analog Communications | C213.1 | Demonstrate the need for modulation and also the basic blocks and circuits present in a communication system, square law and switching modulator and demodulators | Apply |
| | C213.2 | Distinguish various analog modulation techniques like DSB, SSB and VSB with their generation, detection methods and also system performance in presence of Noise | Apply |
| | C213.3 | Analyze Frequency modulators and Demodulators with their spectrum, average power, band width, and also with AM | Analyze |
| | C213.4 | Sketch the AM, FM radio transmitter and receiver circuits with the role of AGC /AFC | Apply |
| | C213.5 | Discriminate different types of pulse analog modulation Techniques such as PAM,PWM and PPM with their modulation and Demodulation methods | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C213.1 | 3 | 2 | 3 | 2 | 1 | 2 | | | | | | | 3 | |
| C213.2 | 3 | 2 | 3 | 3 | 2 | 1 | | | | | | | 3 | |
| C213.3 | 3 | 3 | 3 | 2 | 1 | 1 | | | | | | | 3 | |
| C213.4 | 3 | 2 | 3 | 2 | 2 | 2 | | | | | | | 3 | |
| C213.5 | 3 | 3 | 3 | 3 | 2 | 2 | | | | | | | 3 | |
| AVG | 3 | 2.4 | 3 | 2.4 | 1.6 | 1.6 | | | | | | | 3 | |

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|---|---|---|---|
| Pulse and Digital circuits lab | C214.1 | Define the concept of linear wave shaping circuits and analyze the response of linear wave shaping circuits for different signals. | Analyze |
| | C214.2 | analyze the non-linear wave shaping circuits, | Analyze |
| | C214.3 | Demonstrate switching characteristics of diodes and transistors | Apply |
| | C214.4 | Design and analyze different multivibrators and time base generators | Apply |
| | C214.5 | Analyze operation and verify the outputs of sampling gates and logic families | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C214.1 | 3 | 2 | 2 | | | | | | | | | | 3 | |
| C214.2 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C214.3 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C214.4 | | 2 | 3 | 3 | | | | | | | | | 3 | |
| C214.5 | | | | 2 | | | | | | | | | 3 | |
| AVG | 3 | 2.5 | 2.75 | 2.5 | | | | | | | | | 3 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** II **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Electronic Circuit Analysis - Lab | C215.1 | Analyze the frequency response of single, multistage amplifiers and feedback amplifiers | Analyze |
| | C215.2 | Design and simulate RC and LC Oscillators for the given specifications | Create |
| | C215.3 | Compare the Efficiency of Class A and Class B Amplifiers and calculate the resonant frequency of Tuned amplifiers. | Analyze |
| | C215.4 | Design multistage amplifiers, feedback amplifiers, power amplifiers, tuned amplifiers using MULTISIM Simulation tool. | Create |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C215.1 | 3 | 3 | 3 | 3 | 3 | | | 3 | | | | | | 3 |
| C215.2 | 3 | 3 | 3 | 3 | 3 | | | 2 | | | | | | 3 |
| C215.3 | 3 | 3 | 3 | 3 | 3 | | | 3 | | | | | | 3 |
| C215.4 | 3 | 3 | 2 | 2 | 3 | | | | | | | | | 3 |
| AVG | 3 | 3 | 2.75 | 2.75 | 3 | | | 2.667 | | | | | | 3 |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** II **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Analog Communications - Lab | C216.1 | Compare different amplitude modulated (DSB-FC, DSB-SC, SSB) signals and observe the operation of peak detector in demodulation process | Analyze |
| | C216.2 | Perform frequency modulation & demodulation and recognize need for pre-emphasis and de-emphasis | Apply |
| | C216.3 | Perform signal sampling and observe the PAM, PWM and PPM signals and their demodulation. | Apply |
| | C216.4 | Implement AGC and PLL circuits in communication systems to regulate signal strength and maintain frequency synchronization | Apply |
| | C216.5 | Simulate various analog and pulse modulation & demodulation schemes using Simulink- | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C216.1 | 3 | 3 | 2 | 2 | | | | | | | | | 3 | |
| C216.2 | 2 | - | 2 | - | - | | | | | | | | 3 | |
| C216.3 | 3 | 2 | - | - | - | | | | | | | | 3 | |
| C216.4 | 3 | 3 | 3 | 3 | - | | | | | | | | 3 | |
| C216.5 | 3 | 2 | 2 | 2 | 2 | | | | | | | | 3 | |
| AVG | 2.80 | 2.50 | 2.25 | 2.33 | 2.00 | | | | | | | | 3.00 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Computer Architecture and Organization | C301.1 | Illustrate basic architecture of modern computers and calculate its performance using performance equation | Apply |
| | C301.2 | Interpret machine instruction types and determine the effective address of operand using addressing modes | Analyze |
| | C301.3 | Categorize various instructions to perform arithmetic, logical and branch operations; | Analyze |
| | C301.4 | Illustrate various bus structures and interfacing technique for I/O organization | Apply |
| | C301.5 | Demonstrate memory management and executing process of various operations of modern computer | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C301.1 | 2 | 3 | 3 | | | | | | | | | | | 3 |
| C301.2 | 2 | 3 | 2 | | | | | | | | | | | 3 |
| C301.3 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C301.4 | 3 | 3 | 2 | | | | | | | | | | | 3 |
| C301.5 | 3 | 3 | | | | | | | | | | | | 3 |
| AVG | 2.6 | 3 | 2.5 | | | | | | | | | | | 3 |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Linear Integrated Circuits and Applications | C302.1 | Analyze the IC 741 operational amplifier. Compare performance metrics for different configurations | Analyze |
| | C302.2 | Illustrate and design the linear, non-linear applications of Op-Amp and active filters | Apply |
| | C302.3 | Design and analyze the working of multivibrators using IC 555 | Analyze |
| | C302.4 | Illustrate the functional characteristics of VCO, PLL and its applications in communication. | Apply |
| | C302.5 | Demonstrate and Compare working principle of various data converters using Op-Amp | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C302.1 | 3 | 3 | 2 | 2 | | | | | | | | | | 3 |
| C302.2 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | 3 |
| C302.3 | 3 | 3 | 2 | 2 | 2 | | | | | | | | | 3 |
| C302.4 | 3 | | 2 | 2 | 2 | | | | | | | | | 3 |
| C302.5 | 3 | 3 | 3 | 3 | 2 | | | | | | | 2 | | 3 |
| AVG | 3 | 3 | 2.4 | 2.4 | 2.25 | | | | | | | 2 | | 3 |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **DIGITAL IC APPLICATIONS** | C303.1 | Analyze the commercially available digital integrated circuit families. | Analyze |
| | C303.2 | Apply the knowledge of hardware description language (VHDL) concept to model the any digital circuit. | Apply |
| | C303.3 | Illustrate combinational and sequential logic circuits using different ICs. | Apply |
| | C303.4 | Develop and synthesis the HDL code for combinational and sequential circuits. | Analyze |
| | C303.5 | Test for the functionality of combinational and sequential circuits using EDA tools. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C303.1 | 2 | 3 | 3 | | | | | | | | | | | 2 |
| C303.2 | 3 | 2 | 3 | 3 | | | | | | | | | | 3 |
| C303.3 | 3 | 3 | 3 | 3 | | | | | | | | | | 2 |
| C303.4 | 3 | 3 | 3 | 3 | | | | | | | | | | 2 |
| C303.5 | 2 | 2 | 3 | 3 | 3 | | | | | | | 1 | | 3 |
| AVG | 2.6 | 2.6 | 3 | 3 | 3 | | | | | | | 1 | | 2.4 |

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Digital Communications** | C304.1 | Analyze the wave form coding techniques in PCM, DPCM, DM, ADM and effect of noise | Analyze |
| | C304.2 | Analyze and compare various digital modulation schemes (ASK, FSK, PSK, DPSK, QPSK, M-ary PSK) and evaluate the performance of coherent and non-coherent matched filters in signal detection. | Analyze |
| | C304.3 | Apply knowledge of information, entropy, information rate mutual information to evaluate channel capacity. | Apply |
| | C304.4 | Analyze Shannon- Fano , Huffman source encoder with efficiency and also linear block codes | Analyze |
| | C304.5 | Apply Time, transform domain, graphical approach to code convolution codes & decode using viterbi algorithm. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C304.1 | 1 | 3 | 3 | 2 | 2 | 1 | | | | | | 1 | 3 | |
| C304.2 | 2 | 3 | 3 | 3 | 2 | | | | | | | | 3 | |
| C304.3 | 3 | 3 | 3 | 3 | 3 | | | | | | | 3 | 3 | |
| C304.4 | 2 | 3 | 3 | 3 | 2 | | | | | | | | 3 | |
| C304.5 | 2 | 3 | 3 | 3 | 3 | | | | | | | | 3 | |
| AVG | 2 | 3 | 3 | 2.8 | 2.4 | 1 | | | | | | 2 | 3 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Antenna & Wave Propagation** | C305.1 | Define antenna parameters & Illustrate the concept of radiation by applying mathematical formulation | Apply |
| | C305.2 | Design & Analyze the performance characteristics of loop & array of antennas | Analyze |
| | C305.3 | Calculate the gain and draw the radiation pattern of different antennas | Evaluate |
| | C305.4 | Analyze characteristics of different non resonant radiators and draw the waveforms. | Analyze |
| | C305.5 | Illustrate the atmospheric effects on EM wave propagation | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C305.1 | 3 | 2 | 2 | | | | | | | | | | 3 | |
| C305.2 | | 2 | 3 | 3 | | | | | | | | | 3 | |
| C305.3 | 3 | 2 | 3 | | | | | | | | | | 2 | |
| C305.4 | 3 | 2 | 3 | | | | | | | | | | 2 | |
| C305.5 | | 3 | 3 | 3 | | | | | | | | | 3 | |
| AVG | 3 | 2.2 | 2.8 | 3 | | | | | | | | | 2.6 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Professional ethics and human values | C306.1 | Identify human Values and ethics useful for the survival in Society | Understand |
| | C306.2 | Illustrate professional roles played by an engineer in the society | Apply |
| | C306.3 | Interpret the concepts of Engineering in social experimentation | Apply |
| | C306.4 | Illustrate the role of engineers to maintain safety | Apply |
| | C306.5 | Identify the rights and responsibilities of engineers at work place. | Analyze |
| | C306.6 | Explain different issues related to globalization and research. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C306.1 | | | | | | | 2 | | 3 | | | 1 | | |
| C306.2 | | | | | | | 2 | | 3 | | | 1 | | |
| C306.3 | | | | | | | 2 | | 3 | | | 1 | | |
| C306.4 | | | | | | | 2 | | 3 | | | 1 | | |
| C306.5 | | | | | | | 2 | | 3 | | | 1 | | |
| C306.6 | | | | | | | 2 | | 3 | | | 1 | | |
| AVG | | | | | | | 2 | | 3 | | | 1 | | |

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **PDC lab** | C307.1 | Analyze linear and non linear wave shaping | Apply |
| | C307.2 | Design & analyze transistor as a switch | Analyze |
| | C307.3 | Verify logic gates, flip-flops & sampling gates | Apply |
| | C307.4 | Design & analyze various multivibrators | Apply |
| | C307.5 | Generate time base signals using bootstrap circuit | Create |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C307.1 | 3 | 2 | 2 | 2 | | | | | | | | | 2 | |
| C307.2 | 3 | 2 | 3 | 3 | | | | | | | | | 3 | |
| C307.3 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C307.4 | 3 | 2 | 3 | 3 | | | | | | | | | 3 | |
| C307.5 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| AVG | 3 | 2.4 | 2.8 | 2.75 | | | | | | | | | 2.6 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IIi **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Linear Integrated Circuits and Applications - Lab | C308.1 | Evaluate and design performance of linear and non-linear applications of Operational amplifier using IC741 | Evaluate |
| | C308.2 | Design and analyze the performance of active filters | Create |
| | C308.3 | Design and analyze the performance of different Multivibrators using IC 555 | Analyze |
| | C308.4 | Analyze the response of IC 566 & 565 | Analyze |
| | C308.5 | Examine the performance of different voltage regulation techniques (e.g., 5V, 9V, and 12V), assess their efficiency and stability, and compare their suitability for various applications. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C308.1 | 2 | 2 | 2 | 3 | 2 | | | | | | | | 3 | 3 |
| C308.2 | 2 | 2 | 2 | 3 | 2 | | | | | | | | 3 | 3 |
| C308.3 | 2 | 2 | 2 | 3 | 2 | | | | | | | | 3 | 3 |
| C308.4 | | | | 3 | | | | | | | | | 3 | 3 |
| C308.5 | | | | 3 | | | | | | | | | 3 | 3 |
| AVG | 2 | 2 | 2 | 3 | 2 | | | | | | | | 3 | 3 |

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

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After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **DICA lab** | C309.1 | Demonstrate the use of xilinx ISE software and realize basic digital circuits using VHDL. | Apply |
| | C309.2 | Analyze the functionality of Combinational circuits and Sequential Circuits using digital ICs. | Analyze |
| | C309.3 | Develop a program and synthesize a given application / problem statement using EDA tools. | Apply |
| | C309.4 | Design and model complex digital system independently or in a team. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C309.1 | 2 | 3 | | 3 | 3 | | | | | | | | | 3 |
| C309.2 | 2 | 3 | 3 | | | | | | | | | | | 2 |
| C309.3 | 1 | 2 | 3 | 3 | 3 | | | | | | | | | 3 |
| C309.4 | 2 | 2 | 3 | 3 | | | | | | | | | | 3 |
| AVG | 1.75 | 2.5 | 3 | 3 | 3 | | | | | | | | | 2.75 |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Microprocessor and Microcontrollers | C310.1 | Apply the concepts of buses to discriminate the architectural view of Microprocessors and Microcontrollers | Apply |
| | C310.2 | Illustrate various addressing modes and instruction sets of Microprocessors and Microcontrollers to develop Assembly language programs | Apply |
| | C310.3 | Analyze different programmable interfacing modules to interface with microprocessors and controllers for real time applications. | Analyze |
| | C310.4 | Analyze and Compare the features and functional concepts of advanced ARMprocessors and Microcontrollers. | Analyze |
| | C310.5 | Develop a report to generate a code for applications using microprocessors and microcontrollers to meet the societal requirements. | Create |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C310.1 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C310.2 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C310.3 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C310.4 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C310.5 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| AVG | 3.00 | 3.00 | 3.00 | | | | | | | | | | | 3.00 |

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After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Micro Wave Engineering | C311.1 | Identify and differentiate between TE, TM, TEM, and hybrid modes in waveguide structures. | Apply |
| | C311.2 | Ilustrate Rectangular and Circular Waveguides | Apply |
| | C311.3 | Illustrate Rectangular and Circular Resonators | Apply |
| | C311.4 | Calculate S-matrix for various waveguide components and Develop the splitting of the microwave energy in a desired direction | Analyze |
| | C311.5 | Compare and Differentiate Microwave Tubes and Solid-State Devices | Analyze |
| | C311.6 | Calculate various microwave parameters | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C311.1 | 3 | 3 | 3 | | | | | | | | | | 2 | |
| C311.2 | 3 | 3 | 3 | | | | | | | | | | 2 | |
| C311.3 | 3 | 3 | 3 | | | | | | | | | 2 | 2 | |
| C311.4 | 3 | 3 | 3 | | | | | | | | | 2 | 2 | |
| C311.5 | 3 | 3 | 3 | | | | | | | | | 2 | 3 | |
| C311.6 | 3 | 3 | 3 | | | | | | | | | 2 | 3 | |
| AVG | 3.00 | 3.00 | 3.00 | | | | | | | | | 2.00 | 2.33 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| VLSI | C312.1 | Analyze the electrical properties of transistors and make use of fabrication to build CMOS circuits. | Analyze |
| | C312.2 | Investigate the characteristics of CMOS circuits to examine the electrical behavior of digital circuits. | Analyze |
| | C312.3 | Construct the layout of any logic circuit by apply the concept of stick diagram and design rules. | Apply |
| | C312.4 | Implement and experiment with SRAM and EPROM programming technologies in FPGA architectures to understand their functionality and application. | Apply |
| | C312.5 | Examine the power dissipation using various approaches in low-power circuit design by utilizing EDA tools such as Mentor Graphics, Cadence, and Microwind.. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C312.1 | 3 | 3 | 2 | | | | | | | | | | | 3 |
| C312.2 | 3 | 3 | 2 | 2 | | | | | | | | | | 3 |
| C312.3 | 3 | 2 | 3 | 3 | | | | | | | | | | 3 |
| C312.4 | 3 | 3 | 3 | | | | | | | | | | | 3 |
| C312.5 | 3 | 2 | 3 | 3 | 3 | | | | | | | 2 | | 3 |
| AVG | 3.00 | 2.60 | 2.60 | 2.67 | 3.00 | | | | | | | 2.00 | | 3.00 |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Digital Signal Processing** | C313.1 | Analyze the Discrete time systems to solve differential equations | Analyze |
| | C313.2 | Implement FFT algorithms to compute the Discrete Fourier Transform (DFT) and analyze the results in signal processing applications. | Apply |
| | C313.3 | Design and implement FIR and IIR digital filters based on given specifications using appropriate design techniques and tools. | Apply |
| | C313.4 | Evaluate the concepts of multirate processing in various applications. | Analyze |
| | C313.5 | Implement signal processing concepts on a DSP processor to solve practical problems. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C313.1 | 2 | 3 | 3 | | | | | | | | | | 3 | |
| C313.2 | 2 | 3 | 3 | | | | | | | | | | 3 | |
| C313.3 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C313.4 | 2 | 3 | 2 | | | | | | | | | | 3 | |
| C313.5 | 2 | 3 | | | | | | | | | | | 3 | |
| AVG | 2.2 | 3 | 2.75 | | | | | | | | | | 3 | |

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **OOPs through JAVA** | C314.1 | Demonstrate Various Concepts of Object Oriented Programming language. | Apply |
| | C314.2 | Differentiates between instance variables, static variables, and local variables. | Analyze |
| | C314.3 | Implements custom exceptions, assertions, and package-based organization. | Apply |
| | C314.4 | Executes Java threads using Thread class and ensures proper completion using join(). | Analyze |
| | C314.5 | Judges the advantages and limitations of using AWT vs. Swing for GUI applications. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C314.1 | 2 | 2 | 3 | | | | | | | | | | | |
| C314.2 | 1 | 2 | 3 | | | | | | | | | | | |
| C314.3 | 1 | 2 | 3 | | | | | | | | | | | |
| C314.4 | 2 | 2 | 3 | | | | | | | | | | | |
| C314.5 | 2 | 2 | 3 | | | | | | | | | | | |
| AVG | 1.6 | 2 | 3 | | | | | | | | | | | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **IPR Patents and Intellectual Properties** | C315.1 | Demonstrates the ability to differentiate between various types of intellectual property and their applications. | Apply |
| | C315.2 | Applies copyright laws to protect creative works from unauthorized use. | Apply |
| | C315.3 | Examines how various countries implement patent protection differently. | Analyze |
| | C315.4 | Analyzes the importance of trademark enforcement and legal protections. | Analyze |
| | C315.5 | Validates best practices for enforcing trade secret policies and legal compliance. | Evaluate |
| | C315.6 | Assesses the effectiveness of national and international cyber laws in preventing cyber crimes. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C315.1 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| C315.2 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| C315.3 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| C315.4 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| C315.5 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| C315.6 | | | | | | 2 | | 3 | | | 1 | 1 | | |
| avg | | | | | | 2 | | 3 | | | 1 | 1 | | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Microprocessor and Microcontrollers - Lab | C316.1 | Discriminate the fundamental of assembly level programming of microprocessors and microcontrollers. | Analyze |
| | C316.2 | Develop and execute different assembly language programs by applying the 8086 microprocessor and 8051 microcontroller instruction sets. | Apply |
| | C316.3 | To interface different I/O devices to processor & controller, and will explore several techniques of interfacing | Apply |
| | C316.4 | Compare different implementations and Design simple microcontroller based system for real time applications. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C316.1 | 3 | 3 | | | | | | | | | | | | 3 |
| C316.2 | | 2 | 3 | 2 | 2 | | | | | | | | | 3 |
| C316.3 | | | 3 | 3 | 3 | | | | | | | | | 3 |
| C316.4 | | | | 3 | 3 | | | | | | | 3 | | 3 |
| AVG | 3.00 | 2.50 | 3.00 | 2.67 | 2.67 | | | | | | | 3.00 | | 3.00 |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** II **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| VLSI Lab | C317.1 | Design and implement circuits, generate symbols, and create layouts for real-time applications using Mentor Graphics tools. | Apply |
| | C317.2 | Examine the characteristics of CMOS-based analog and digital circuits to evaluate their performance and applications. | Analyze |
| | C317.3 | Design and construct layouts for complex CMOS logic circuits, ensuring compliance with design rules. | Apply |
| | C317.4 | Evaluate the performance of analog/digital circuits in terms of power, speed and area. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C317.1 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | 3 |
| C317.2 | 3 | 2 | 2 | | | | | | | | | | | 3 |
| C317.3 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | 3 |
| C317.4 | 3 | 3 | 2 | 2 | 2 | | | | | | | | | 3 |
| AVG | 3 | 2.25 | 2 | 2 | 2 | | | | | | | | | 3 |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** III **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| Digital Communications Lab | C318.1 | Implement and verify pulse digital communication techniques using EDA tools to simulate and analyze system performance. | Apply |
| | C318.2 | Demonstrate and simulate Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Differential Phase Shift Keying (DPSK), and Companding techniques to analyze their performance in communication systems. | Analyze |
| | C318.3 | Implement and verify Binary Cyclic Code encoder and decoder using simulation tools to evaluate their error detection and correction capabilities. | Apply |
| | C318.4 | Utilize MATLAB software to implement and demonstrate basic applications in engineering and signal processing | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C318.1 | 3 | 3 | 2 | 2 | 2 | | | | | | | | 3 | |
| C318.2 | 3 | 2 | 2 | 2 | | | | | | | | | 3 | |
| C318.3 | 3 | 2 | 3 | 3 | 3 | | | | | | | | 3 | |
| C318.4 | 3 | 3 | | 3 | 3 | | | | | | | | 3 | |
| AVG | 3.00 | 2.50 | 2.33 | 2.50 | 2.67 | | | | | | | | 3.00 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **RADAR Engineering** | C401.1 | Demonstrate the RADAR principle using basic block diagram and solve the radar range equation to predict range performance, receiver noise, SNR, probability of detection probability of false alarm ,transmitter power. | Apply |
| | C401.2 | Analyze different types of radars: CW , FM-CW,MTI and pulse doppler radars with their principle | Analyze |
| | C401.3 | Examine the various tracking mechanisms in amplitude comparison mono pulse and phase comparison mono pulse tracking radars. | Analyze |
| | C401.4 | Calculate the efficiency of Non-matched filters, matched filters with Non- white noise, noise figure and noise temperature | Evaluate |
| | C401.5 | Compare types of displays duplexers and phased array antennas, randoms with their basic concepts, applications, advantages, limitations. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C401.1 | 2 | 3 | 2 | 2 | | | | | | | | | 2 | |
| C401.2 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 2 | |
| C401.3 | 2 | 3 | 2 | 2 | 2 | | | | | | | 2 | 2 | |
| C401.4 | 2 | 3 | 3 | 3 | 2 | | | | | | | 2 | 2 | |
| C401.5 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | | | | | 2 | 2 | |
| AVG | 2.2 | 3 | 2.6 | 2.6 | 2.25 | 2 | 2 | | | | | 2 | 2 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Digital Image Processing** | C402.1 | Examine the image formation model and fundamental concepts involved in digital image processing to manipulate gray and color image data. | Analyze |
| | C402.2 | Implement various transformation techniques to process and enhance images for analysis. | Apply |
| | C402.3 | Utilize fundamental image enhancement algorithms in spatial and frequency domains along with restoration techniques to improve image quality. | Apply |
| | C402.4 | Illustrate various coding techniques for image compression and multiresolution processing | Apply |
| | C402.5 | Implement different reshaping operations on images using morphological algorithms and identify the Region of Interest by applying segmentation techniques on gray and color images. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C402.1 | 2 | 3 | | | | | | | | | | | 2 | |
| C402.2 | 2 | 3 | 3 | | | | | | | | | | 3 | |
| C402.3 | 2 | 2 | 3 | | | | | | | | | | 3 | |
| C402.4 | 2 | 3 | 3 | | | | | | | | | | 3 | |
| C402.5 | 2 | 3 | 3 | | | | | | | | | | 3 | |
| AVG | 2 | 2.8 | 3 | | | | | | | | | | 2.8 | |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Computer Networks** | C403.1 | Compare OSI and TCP/IP models effectively. | Analyze |
| | C403.2 | Utilize the concepts of physical and data link layers to analyze network communication and implement different multiplexing techniques for efficient data transmission. | Apply |
| | C403.3 | Analyze Datalink layer services and protocol types efficiently. | Analyze |
| | C403.4 | Illustrate MAC sublayer, multiple access protocol and analyze Ethernet and WLAN architectures. | Apply |
| | C403.5 | Analyzing Network layer design issues, routing using congestion control algorithms. | Analyze |
| | C403.6 | Assess the functionality of Internet Transport Protocol and critically examine the operations of DNS and Electronic Mail for efficient network communication. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C403.1 | | 2 | | | | | 2 | | | | | | | 3 |
| C403.2 | | 2 | | | | | 2 | | | | | | | 2 |
| C403.3 | | 3 | | | | | 2 | | | | | | | 3 |
| C403.4 | | 2 | 2 | | | | | | | | | | | 2 |
| C403.5 | | 2 | | | 2 | | | | | | | | | 2 |
| C403.6 | | 2 | | | 2 | | | | | | | | | 3 |
| AVG | | 2.17 | 2.00 | | 2.00 | | 2.00 | | | | | | | 2.50 |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Optical Communications** | C404.1 | Analyze optical fiber waveguides, signal distortion, dispersion in optical fibers and also Solve problems using Ray theory, electromagnetic mode theory, scattering mechanisms in optical fibers | Analyze |
| | C404.2 | Analyze connectors, splices in optical waveguides and also Calculate fiber alignment joint loss in fiber joints | Analyze |
| | C404.3 | Compare line coding techniques, digital-, analog- receivers used in optical communication systems and also calculate the amount of light lost and dispersion in an optical system | Analyze |
| | C404.4 | Analyze optical fiber systems using different types of photo detectors and optical test equipment | Analyze |
| | C404.5 | Analyze point-to-point links using link power-, rise time-budgets, and also Compare optical sources, and detectors used in optical communication systems | Analyze |
| | C404.6 | Compare measurement of attenuation, dispersion using different methods and also Analyze eye pattern technique in a digital transmission system | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C404.1 | 3 | 3 | 3 | | | | | | | | | | 3 | |
| C404.2 | 3 | 3 | 3 | | | | | | | | | | 2 | |
| C404.3 | 3 | 3 | 3 | | | | | | | | | 2 | 3 | |
| C404.4 | 3 | 3 | 3 | | | | | | | | | 2 | 2 | |
| C404.5 | 3 | 3 | 3 | | | | | | | | | 2 | 3 | |
| C404.6 | 3 | 3 | 3 | | | | | | | | | 2 | 3 | |
| AVG | 3.00 | 3.00 | 3.00 | | | | | | | | | 2.00 | 2.67 | |

Faculty In-charge HOD

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Electronic Switching Systems** | C405.1 | Evaluate the time and space parameters of a switched signal | Evaluate |
| | C405.2 | Describe the digital signal path in time and space, between two terminals | Apply |
| | C405.3 | Evaluate the inherent facilities within the system to test some of the SLIC, CODEC and digital switch functions. | Evaluate |
| | C405.4 | Investigate the traffic capacity of the system. | Analyze |
| | C405.5 | Evaluate methods of collecting traffic data. | Evaluate |
| | C405.6 | Evaluate the method of interconnecting two separate digital switches. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C405.1 | 2 | 2 | 1 | 1 | | | | | | | | | 2 | |
| C405.2 | 2 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C405.3 | 2 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C405.4 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C405.5 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C405.6 | 3 | 3 | 3 | 3 | | | | | | | | 3 | 2 | |
| AVG | 2.50 | 2.83 | 2.67 | 2.67 | | | | | | | | 3.00 | 2.00 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Embedded Systems** | C406.1 | Apply an appropriate software tools to provide an interface between peripherals and systems | Apply |
| | C406.2 | Identify a suitable firmware to meet real time computing constraints of and embedded systems | Apply |
| | C406.3 | Design the subsystems and integrate for a complete system so that we able to know an embedded system. | Evaluate |
| | C406.4 | Analyze the basic concepts of an embedded system so that we able to know an embedded system design approach to perform a specific function | Analyze |
| | C406.5 | Prepare programing environment used to develop embedded system | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C406.1 | 2 | 1 | 2 | | | | | | | | | | | 3 |
| C406.2 | 2 | 2 | 2 | | 2 | | | | | | | | | 3 |
| C406.3 | | | 3 | 2 | | | | | | | | | | 3 |
| C406.4 | 2 | 2 | | 1 | | | | | | | | | | 3 |
| C406.5 | 2 | 2 | 3 | 2 | | | | | | | | | | 3 |
| avg | 2.00 | 1.75 | 2.50 | 1.67 | 2.00 | | | | | | | | | 3.00 |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **MicoWave Lab** | C407.1 | Apply the principles of microwave semiconductor devices to analyze and interpret the voltage-current characteristics of a Gunn Diode using a Gunn Power Supply. | Apply |
| | C407.2 | *Evaluate the performance characteristics such as attenuation, impedance, frequency response, and radiation patterns of Horn and Parabolic antennas using the X-band Microwave bench setup.* | Analyze |
| | C407.3 | Analyze the scattering parameters of microwave components such as Circulator and Magic Tee using the X-band Microwave bench setup to interpret their behavior in microwave networks. | Analyze |
| | C407.4 | Apply the principles of microwave engineering to determine the characteristics of a Directional Coupler and a Reflex Klystron through experimental analysis. | Apply |
| | C407.5 | Apply electromagnetic design principles to synthesize and simulate microstrip antennas using HFSS software. | Apply |
| | C407.6 | Examine the characteristics of optical sources like LEDs and Laser diodes, and interpret key performance parameters such as Numerical Aperture, losses in Analog Optical links, and data rate in Digital Optical links. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C407.1 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C407.2 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C407.3 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C407.4 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C407.5 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 3 | |
| C407.6 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| avg | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | | | | | | | | 2.67 | |

Faculty In-charge HOD

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **DSP LAB** | C408.1 | Implement various signal operations and verify their results using MATLAB software. | Apply |
| | C408.2 | Design Digital filters (IIR & FIR) to detect frequency response using MATLAB software. | Apply |
| | C408.3 | Analyze the functionality of DSP algorithms by simulating and executing them on the DSP Starter Kit using Code Composer Studio, and interpret their performance in real-time applications. | Analyze |
| | C408.4 | Apply enhancement algorithms, restoration and transformation techniques to improve the quality of an image using MATLAB software. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C408.1 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 2 | |
| C408.2 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 2 | |
| C408.3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 3 | |
| C408.4 | 3 | 3 | 3 | 3 | 3 | | | | | | | | 3 | |
| avg | 3 | 3 | 3 | 3 | 3 | | | | | | | | 2.5 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Cellular and Mobile communications** | C409.1 | Analyze the cellular mobile system and concepts like frequency reuse,cellular structures and shapes. | Analyze |
| | C409.2 | Apply the concept of interference and analyze different types of antennas its parameters and effects in cellular systems. | Apply |
| | C409.3 | Distinguish the frequency management, Channel assignment and signal coverage of a cell. | Apply |
| | C409.4 | Analyze the handoff strategies and vehicle locating methods in a cell. | Analyze |
| | C409.5 | Detect various architectures and access schemes in cellular networks. | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C409.1 | 2 | 3 | 2 | | 2 | | | | | | | | 2 | |
| C409.2 | 2 | 3 | 3 | 2 | 2 | | | | | | | 2 | 3 | |
| C409.3 | 1 | 3 | 1 | | 2 | | | | | | | | 3 | |
| C409.4 | 3 | 3 | 2 | | | | | | | | | | 3 | |
| C409.5 | 3 | 2 | | 3 | 3 | | | | | | | | 3 | |
| avg | 2.2 | 2.8 | 2 | 2.5 | 2.25 | | | | | | | 2 | 2.8 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** I **REGULATION :** R16 **BATCH:** 2018-22

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Elecctronic Measurement and Instrumentation** | C410.1 | Apply the acquired knowledge of measuring instrumentations to measure in a complex design | Apply |
| | C410.2 | Analyze the available oscilloscopes to measure of various signal | Analyze |
| | C410.3 | identify the appropriate transducers among available transducer to design project | Apply |
| | C410.4 | analyze various bridge circuits for the measurement of physical quantities to minimize errors in measurements | Analyze |
| | C410.5 | inspect data acquisition systems and to apply for instrumentation in industrial | Apply |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C410.1 | 2 | 3 | 3 | | | | | | | | | | 2 | |
| C410.2 | 3 | 2 | 3 | 3 | | | | | | | | | 3 | |
| C410.3 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C410.4 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C410.5 | 2 | 2 | 3 | | | | | | | | | | 3 | |
| avg | 2.6 | 2.6 | 3 | 3 | | | | | | | | | 2.6 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

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| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Satellite Communications** | C411.1 | Apply Kepler's laws of planetary motion to analyze orbital mechanics and launching methods of satellites. | Apply |
| | C411.2 | Categorize various types of Satellite subsystems and evaluate reliability and space qualification. | Analyze |
| | C411.3 | Deduce the expression for G/T ratio to assess the satellite link budget. | Apply |
| | C411.4 | Apply the knowledge of various multiple access techniques for satellite communication design. | apply |
| | C411.5 | Analyze the principles of low earth orbits and geo-stationary satellite systems. | Analyze |
| | C411.6 | Develop an understanding of satellite navigation systems using GPS for tracking and launching. | Evaluate |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C411.1 | 3 | 3 | 2 | 2 | | | | | | | | | 2 | |
| C411.2 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C411.3 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.4 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.5 | 2 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.6 | 2 | 3 | 3 | 3 | | | | | | | | | 3 | |
| AVG | 2.667 | 3 | 2.833 | 2.833 | | | | | | | | | 2.6667 | |

Faculty In-charge HOD

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**YEAR :** IV **SEM:** II **REGULATION :** R16 **BATCH:** 2018-22

After completion of the course the students will be able to

| NAME OF THE COURSE | CO# | COURSE OUTCOME STATEMENTS | BLOOMS TAXANOMY LEVEL |
|---|---|---|---|
| **Wireless Sensor Networks** | C412.1 | Illustrate wireless sensor networks and its architectures effectively. | Apply |
| | C412.2 | Define different networking technologies, topologies and its applications. | Apply |
| | C412.3 | Describe the MAC protocols for wireless sensor networks and its advantages. | Apply |
| | C412.4 | Explain the concepts of routing protocols, issues and types effciently. | Analyze |
| | C412.5 | Analyze the functionalities of transport layer and apply security protocols. | Analyze |
| | C412.6 | Analyzing security attacks in WSN applications, evaluate sensor network platform and tools. | Analyze |

CO-PO & CO-PSO Mapping Table:

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C411.1 | 3 | 3 | 2 | 2 | | | | | | | | | 2 | |
| C411.2 | 3 | 3 | 3 | 3 | | | | | | | | | 2 | |
| C411.3 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.4 | 3 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.5 | 2 | 3 | 3 | 3 | | | | | | | | | 3 | |
| C411.6 | 2 | 3 | 3 | 3 | | | | | | | | | 3 | |
| AVG | 2.667 | 3 | 2.833 | 2.833 | | | | | | | | | 2.6667 | |

Faculty In-charge HOD

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