DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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Regulation : R19   **Batch : 2019-2023**

S.No	Regulation	Course Code	YEAR/SEM	Name of the Course	No. of COs Defined
LIST OF COURSE OUTCOMES DEFINED FOR A BATCH - 2019-23					
1	R19	C201	II-I	ELECTRONIC DEVICES AND CIRCUITS	5
2	R19	C202	II-I	SWITCHING THEORY AND LOGIC DESIGN	5
3	R19	C203	II-I	SIGNALS & SYSTEMS	4
4	R19	C204	II-I	RANDOM VARIABLES AND STOCHASTIC PROCESS	6
5	R19	C205	II-I	OOPS THROUGH JAVA	5
6	R19	C206	II-I	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	6
7	R19	C207	II-I	ELECTRONIC DEVICES AND CIRCUITS LAB	4
8	R19	C208	II-I	SWITCHING THEORY AND LOGIC DESIGN LAB	5
9	R19	C209	II-I	CONSTITUTION OF INDIA	5
10	R19	C210	II-II	ELECTRONIC CIRCUIT ANALYSIS	5
11	R19	C211	II-II	LINEAR CONTROL SYSTEMS	5
12	R19	C212	II-II	ELECTRO MAGNETIC WAVES AND TRANSMISSION LINES	5
13	R19	C213	II-II	ANALOG COMMUNICATIONS	5
14	R19	C214	II-II	COMPUER ARCHITECTURE AND ORGANIZATION	5
15	R19	C215	II-II	MANAGEMENT AND ORGANIZATIONAL BEHAVIOUR	5
16	R19	C216	II-II	ELECTRONICS CIRCUIT ALALYSIS LAB	4
17	R19	C217	II-II	ANALOG COMMUNICATIONS LAB	5
20	R19	C301	III-I	LINEAR IC APPLICATIONS	5
21	R19	C302	III-I	MICROPROCESSORS AND MICROCONTROLLERS LAB	5
22	R19	C303	III-I	DIGITAL COMMUNICATIONS	5
23	R19	C304	III-I	ELECTRONIC MEASUREMENT AND INSTRUMENTATION	5
24	R19	C305	III-I	DSD DESIGN USING HDL	5
25	R19	C306	III-I	LINEAR IC APPLICATIONS LAB	5
26	R19	C307	III-I	DIGITAL COMMUNICATIONS LAB	4
27	R19	C308	III-I	MICROPROCESSORS AND MICROCONTROLLERS LAB	4
28	R19	C309	III-I	ESSENCE OF INDIAN TRADITION KNOWLEDGE	4
29	R19	C311	III-II	WIRED AND WIRELSS TRANSMISSION DEVICES	5
30	R19	C312	III-II	VLSI DESIGN	5
31	R19	C313	III-II	DIGITAL SIGNAL PROCESSING	5
32	R19	C314	III-II	CELLULAR MOBILE COMMUNICATION	5
33	R19	C315	III-II	MEMS & ITS APPLICATIONS	6
34	R19	C316	III-II	INTERNET OF THINGS	5

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35	R19	C317	III-II	VLSI DESIGN LAB	4
36	R19	C318	III-II	DIGITAL SIGNAL PROCESSING LAB	4
37	R19	C319	III-II	IPR & PATENTS	6
39	R19	C401	IV-I	MICROWAVE AND OPTICAL COMMUNICATION ENGINEERING	6
40	R19	C402	IV-I	DATA COMMUNICATIONS AND COMPUTER NETWORKS	5
41	R19	C403	IV-I	DIGITAL IMAGE AND VIDEO PROCESSING	6
42	R19	C404	IV-I	COMMUNICAITON STANDARD & PROTOCOLS	5
43	R19	C405	IV-I	LOW POWER VLSI	5
44	R19	C406	IV-I	INTERNET OF THINGS LAB	4
45	R19	C407	IV-I	MW&OC ENGINEERING LAB	6
46	R19	C409	IV-II	WIRELESS COMMUNICATION	5
47	R20	C410	IV-II	BLOCK CHAIN TECHNOLOGY	5

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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
Electronic Devices and Circuits	C201.1	Interpret the concepts of Semiconductor physics to understand various electronic devices.	Apply
	C201.2	Demonstrate the construction, working principle and V-I characteristics of various Non linear devices.	Apply
	C201.3	Compare different types of rectifiers with and without filters with relevant expressions.	Analyze
	C201.4	Understand different Biasing and Stabilization methods for BJT and FET.	Understand
	C201.5	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
C201.1	3	2												3
C201.2	3	3												3
C201.3	3	3												3
C201.4														3
C201.5	3	3	3											3
C201	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	C202.1	Illustrate the importance of various number systems and to perform different arithmetic operations on them.	Apply
	C202.2	Apply Boolean algebra postulates-map and tabulation methods to minimize Boolean functions	Apply
	C202.3	Illustrate various combinational and sequential circuits used in digital systems.	Apply
	C202.4	Design various PLDs such as ROMs,PALs,PLAs and PROMs	Anlayze
	C202.5	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
C202.1	2	3	3											3
C202.2	3	2	3	3										3
C202.3	3	3	3	3										3
C202.4	3	3	3	3										3
C202.5	2	2	3											3
C202	2.6	2.6	3	3										3

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Signals & Systems	C203.1	Classify various types of signals and systems to illustrate their responses	Analyze
	C203.2	Apply transformation methods to solve signals and differential equations.	Apply
	C203.3	Analyze the sampling theorem to calculate nyquist rate	Analyze
	C203.4	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
C203.1	3	2	2										3	
C203.2	3	3	3										3	
C203.3	3	3	3										3	
C203.4	3	3	3										3	
C203	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	C204.1	Interpret the concepts of random variables and stochastic processes in real time applications	Apply
	C204.2	Use the principle definitions, fundamental theorem and important relations in statistics	Apply
	C204.3	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
	C204.4	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
	C204.5	Apply the concepts of power spectral density and cross power spectral density to analyze and interpret the frequency characteristics of random processes	Apply
	C204.6	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
C204.1	3	2	2	2									3	
C204.2	3	3	2	2									3	
C204.3	3	3	2	2									3	
C204.4	2	2	2	2									3	
C204.5	2	2	2	2									3	
C204.6	3	2	2	2									3	
C204	2.7	2.3	2.0	2.0									3.0	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Object Oriented Programming through Java	C205.1	Demonstrate Various Concepts of Object Oriented Programming language.	Apply
	C205.2	Design java programs by using constructor, garbage, static, and nested classes	Create
	C205.3	Design java programming using packages, exception handling, and assertions.	Create
	C205.4	Design the concepts of multi-threaded programming, synchronization and files in java	Create
	C205.5	Design Applet and AWT (abstract window tool kit) programming in java	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	3		2									
C205.2	3	2	3		2									
C205.3	3	2	3		2									
C205.4	3	2	3		2									
C205.5	3	2	3		2									
C205	3	2	3		2									

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Managerial Economics & Financial Analysis	C206.1	Describe the concepts related to demand in economics	Apply
	C206.2	Estimate the production function techniques with Cost Concepts	Analyze
	C206.3	Explain the concept of price output relationship in different market structures	Apply
	C206.4	Outline the different types of business organizations and provide a framework for analyzing money in its functions as a medium of exchange	Apply
	C206.5	Prepare Financial Statements by using several accounting tools...	Analyze
	C206.6	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
C206.1	3	3							2		3	2		
C206.2	3	3							2		3	2		
C206.3	3	3							2		3	2		
C206.4	3	3							2		3	2		
C206.5	3	3							2	2	3	2		
C206.6	3	3							2	2	3	2		
C206	3	3							2	2	3	2		

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
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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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Switching Theory and Logic Design - Lab	C208.1	Test the operation of different logic gates using relevant IC's	Analyse
	C208.2	Examine the operation of different combinational logic circuits.	apply
	C208.3	Apply the concept of Boolean algebra or k-maps to reduce and Construct logic circuit for given function.	apply
	C208.4	Analyse the Truth tables of different Flip-Flops.	Analyse
	C208.5	Design of registers using sequential logic circuits and Design of Synchronous & Asynchronous counters using Flip-Flops.	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	1	2						1					3
C208.2	3	2	2	2					1					3
C208.3	3	3	3						2					3
C208.4	3	3	2	2					1					3
C208.5	3	3	2	2					2					3
C208	2.80	2.40	2.20	2.00					1.40					3.00

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Constitution of India	C209.1	Understand historical background of the constitution making and its importance for building a democratic India	Understand
	C209.2	Understand the functioning of three wings of the government ie.,executive, legislative and judiciary	Understand
	C209.3	Understand the value of the fundamental rights and duties for becoming good citizen of India.	Understand
	C209.4	Analyze the decentralization of power between central, state and local self-government.	Analyze
	C209.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy	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							2		3			1		
C209.2							2		3			1		
C209.3							2		3			1		
C209.4							2		3			1		
C209.5							2		3			1		
C209							2		3			1		

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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
C210	3	2.75	2											2

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
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	
C211	3	3	2.75	2.5									3	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
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	
C212	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	
C213	3	2.4	3	2.4	1.6	1.6							3	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Computer Architecture and Organization	C214.1	Illustrate basic architecture of modern computers and calculate its performance using performance equation	Apply
	C214.2	Interpret machine instruction types and determine the effective address of operand using addressing modes	Analyze
	C214.3	Categorize various instructions to perform arithmetic, logical and branch operations;	Analyze
	C214.4	Illustrate various bus structures and interfacing technique for I/O organization	Apply
	C214.5	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
C214.1	3	3	3											2
C214.2	3	3	2											2
C214.3	3	3	3											2
C214.4	3	3	2											2
C214.5	3	3												3
C214	3	3	2.5											2.2

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Management and Organizational Behavior	C215.1	Demonstrate the application of management functions, global leadership strategies, and organizational structures in real-world business scenarios	Apply
	C215.2	Examine and differentiate the roles of HRM and marketing in new product development, analyzing their impact on organizational success.	Analyze
	C215.3	think in strategically through contemporary management practices.	Analyze
	C215.4	Analyze the relationship between personality development and motivational theories to assess their impact on individual attitude and workplace behavior	Analyze
	C215.5	attain the group performance and grievance handling in managing the organizational culture.	Apply

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							2		3	2		
C215.2	3	3							2		3	2		
C215.3	3	3							2		3	2		
C215.4	3	3							2		3	2		
C215.5	3	3							2	2	3	2		
C215	3	3							2	2	3	2		

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ESTD : 2008

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

YEAR : II   **SEM:** II   **REGULATION :** R19   **BATCH:** 2019-23

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	C216.1	Analyze the frequency response of single, multistage amplifiers and feedback amplifiers	Analyze
	C216.2	Design and simulate RC and LC Oscillators for the given specifications	Create
	C216.3	Compare the Efficiency of Class A and Class B Amplifiers and calculate the resonant frequency of Tuned amplifiers.	Analyze
	C216.4	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
C216.1	3	3	3	3	3			3						3
C216.2	3	3	3	3	3			2						3
C216.3	3	3	3	3	3			3						3
C216.4	3	3	2	2	3									3
C216	3	3	2.75	2.75	3			2.667						3

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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
Analog Communications - Lab	C217.1	Compare different amplitude modulated (DSB-FC, DSB-SC, SSB) signals and observe the operation of peak detector in demodulation process	Analyze
	C217.2	Perform frequency modulation & demodulation and recognize need for pre-emphasis and de-emphasis	Apply
	C217.3	Perform signal sampling and observe the PAM, PWM and PPM signals and their demodulation.	Apply
	C217.4	Implement AGC and PLL circuits in communication systems to regulate signal strength and maintain frequency synchronization	Apply
	C217.5	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
C217.1	3	3	2	2									3	
C217.2	2	-	2	-	-								3	
C217.3	3	2	-	-	-								3	
C217.4	3	3	3	3	-								3	
C217.5	3	2	2	2	2								3	
C217	2.80	2.50	2.25	2.33	2.00								3.00	

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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
Linear Integrated Circuits and Applications	C301.1	Analyze the IC 741 operational amplifier. Compare performance metrics for different configurations	Analyze
	C301.2	Illustrate and design the linear, non-linear applications of Op-Amp and active filters	Apply
	C301.3	Design and analyze the working of multivibrators using IC 555	Analyze
	C301.4	Illustrate the functional characteristics of VCO, PLL and its applications in communication.	Apply
	C301.5	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
C301.1	3	3	2	2										3
C301.2	3	3	3	3	3									3
C301.3	3	3	2	2	2									3
C301.4	3		2	2	2									3
C301.5	3	3	3	3	2							2		3
C301	3	3	2.4	2.4	2.25							2		3

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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
Microprocessor and Microcontrollers	C302.1	Apply the concepts of buses to discriminate the architectural view of Microprocessors and Microcontrollers	Apply
	C302.2	Illustrate various addressing modes and instruction sets of Microprocessors and Microcontrollers to develop Assembly language programs	Apply
	C302.3	Analyze different programmable interfacing modules to interface with microprocessors and controllers for real time applications.	Analyze
	C302.4	Analyze and Compare the features and functional concepts of advanced ARMprocessors and Microcontrollers.	Analyze
	C302.5	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
C302.1	3	3	3											3
C302.2	3	3	3											3
C302.3	3	3	3											3
C302.4	3	3	3											3
C302.5	3	3	3											3
C302	3.00	3.00	3.00											3.00

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YEAR : III   **SEM:** I   **REGULATION :** R19   **BATCH:** 2019-23

After completion of the course the students will be able to

NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Digital Communications	C303.1	Analyze the wave form coding techniques in PCM, DPCM, DM, ADM and effect of noise	Analyze
	C303.2	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
	C303.3	Apply knowledge of information, entropy, information rate mutual information to evaluate channel capacity.	Apply
	C303.4	Analyze Shannon- Fano , Huffman source encoder with efficiency and also linear block codes	Analyze
	C303.5	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
C303.1	1	3	3	2	2	1						1	3	
C303.2	2	3	3	3	2								3	
C303.3	3	3	3	3	3							3	3	
C303.4	2	3	3	3	2								3	
C303.5	2	3	3	3	3								3	
C303	2	3	3	2.8	2.4	1						2	3	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Electronic Measurements & Instrumentation	C304.1	Apply the acquired knowledge of measuring instrumentations to measure in a complex design	Apply
	C304.2	Analyze the available oscilloscopes to measure of various signal	Analyze
	C304.3	identify the appropriate transducers among available transducer to design project	Apply
	C304.4	analyze various bridge circuits for the measurement of physical quantities to minimize errors in measurements	Analyze
	C304.5	inspect data acquisition systems and to apply for instrumentation in industrial	Analyze

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	2	3	3										3	
C304.2	3	2	3	3									3	
C304.3	3	3	3	3									3	
C304.4	3	3	3	3									3	
C304.5	2	2	3										3	
C304	2.6	2.6	3	3									3	

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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
DSD Design using HDL	C305.1	Implement HDL-based design flows for FPGA and ASIC development using Verilog, applying various constructs and conventions to model and simulate digital circuits	Apply
	C305.2	Analyze the design, simulation, testing, and synthesis of combinational circuits and Flip-Flops using Gate Level and Data Flow Modeling in Verilog, evaluating the impact of different delay types and signal strengths on circuit performance	Analyze
	C305.3	Design, Develop, Simulate and Test program codes for behavioral modelling of combinational and sequential logic using Verilog HDL	Create
	C305.4	Implement and simulate various transistor switch configurations using system tasks, primitives, and functions in Verilog to illustrate their functionality in digital circuits.	Apply
	C305.5	Examine various state machine modeling techniques, assess their functionality through design and simulation, and differentiate between test bench techniques for combinational and sequential circuit testing with practical examples.	Analyze

CO-PO & CO-PSO Mapping Table:

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

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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
Linear Integrated Circuits and Applications - Lab	C306.1	Evaluate and design performance of linear and non-linear applications of Operational amplifier using IC741	Evaluate
	C306.2	Design and analyze the performance of active filters	Create
	C306.3	Design and analyze the performance of different Multivibrators using IC 555	Analyze
	C306.4	Analyze the response of IC 566 & 565	Analyze
	C306.5	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
C306.1	2	2	2	3	2								3	3
C306.2	2	2	2	3	2								3	3
C306.3	2	2	2	3	2								3	3
C306.4				3									3	3
C306.5				3									3	3
C306	2	2	2	3	2								3	3

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Digital Communications Lab	C307.1	Implement and verify pulse digital communication techniques using EDA tools to simulate and analyze system performance.	Apply
	C307.2	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
	C307.3	Implement and verify Binary Cyclic Code encoder and decoder using simulation tools to evaluate their error detection and correction capabilities.	Apply
	C307.4	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
C307.1	3	3	2	2	2								3	
C307.2	3	2	2	2									3	
C307.3	3	2	3	3	3								3	
C307.4	3	3		3	3								3	
C307	3.00	2.50	2.33	2.50	2.67								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
Microprocessor and Microcontrollers - Lab	C308.1	Discriminate the fundamental of assembly level programming of microprocessors and microcontrollers.	Analyze
	C308.2	Develop and execute different assembly language programs by applying the 8086 microprocessor and 8051 microcontroller instruction sets.	Apply
	C308.3	To interface different I/O devices to processor & controller, and will explore several techniques of interfacing	Apply
	C308.4	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
C308.1	3	3												3
C308.2		2	3	2	2									3
C308.3			3	3	3									3
C308.4				3	3							3		3
C308	3.00	2.50	3.00	2.67	2.67							3.00		3.00

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Essence of Indian Traditional Knowledge	C310.1	Understand the traditional knowledge	Understand
	C310.2	Contrast and compare characteristics importance kinds of traditional knowledge	Analyze
	C310.3	Analyze physical and social contexts of traditional knowledge.	Analyze
	C310.4	Evaluate social change on traditional knowledge	Evaluate

CO-PO & CO-PSO Mapping Table:

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

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Wired and Wireless Transmission Devices	C311.1	Discuss and analyze microwave transmission lines and micro strip lines	Analyze
	C311.2	Define antenna parameters & Illustrate the concept of radiation by applying mathematical formulation also illustrate the characteristics of radio wave propagation	Apply
	C311.3	Design & Analyze the performance characteristics of wire, loop, Reflector, lens, horn, & Micro Strip antennas	Analyze
	C311.4	Calculate the gain and draw the radiation pattern of different antennas	Analyze
	C311.5	Analyze characteristics of different non resonant radiators and draw the waveforms.	Analyze

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	2	2										3	
C311.2	3	2	3	3									3	
C311.3	3	2	3										3	
C311.4	3	2	3										3	
C311.5	3	3	3	3									3	
C311	3	2.2	2.8	3									3	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
VLSI Design	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
C312	3.00	2.60	2.60	2.67	3.00							2.00		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
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	
C313	2.2	3	2.75										3	

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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
Cellular Mobile Communication	C314.1	Examine the cellular mobile system and concepts like frequency reuse, cellular structures, and shapes.	Analyze
	C314.2	Implement the concept of interference and evaluate different types of antennas, their parameters, and effects in cellular systems.	Apply
	C314.3	Examine the frequency management, channel assignment, and signal coverage of a cell.	Apply
	C314.4	Evaluate the handoff strategies and vehicle locating methods in a cell.	Analyze
	C314.5	Implement and apply various architectures and access schemes in cellular networks to optimize performance and coverage.	Apply

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	3	3	2		2								2	
C314.2	3	3	3	2	2							2	3	
C314.3	3	3	1		2								3	
C314.4	3	3	2										3	
C314.5	3	2		3	3								3	
C314	3	2.8	2	2.5	2.25							2	2.8	

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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
MEMS & its Applications	C315.1	Implement and apply MEMS and Microsystems concepts to design and develop applications across various industries.	Apply
	C315.2	Examine the working principles of micro sensors and actuators to analyze their functionality and applications in various systems.	Analyze
	C315.3	Apply scaling laws to design micro systems, optimizing performance and functionality for various applications.	Apply
	C315.4	Assess the typical materials used for the fabrication of micro systems to evaluate their properties and suitability for different applications.	Analyze
	C315.5	Evaluate the different micro manufacturing processes and their applications.	Analyze
	C315.6	Examine the different types of RF switches, switching mechanisms, and their applications.	Analyze

CO-PO & CO-PSO Mapping Table:

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

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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
Internet of Things	C316.1	Implement and integrate IoT hardware and software components to develop functional IoT systems for practical applications.	Apply
	C316.2	Illustrate diverse methods of deploying smart objects and connect them to network	Apply
	C316.3	Examine and evaluate the components and functionality of simple applications built using Arduino to understand their design and performance.	Analyze
	C316.4	Interpret different protocols and select which protocol can be used for a specific applications	Analyze
	C316.5	Utilize APIs to design and implement a solution for a given application, integrating relevant functionalities.	Apply

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	2		2		2							2		3
C316.2	2		2		2							2		3
C316.3	2	3	2		2							2		3
C316.4	3	3	3		2							2		3
C316.5	3	3	3		2							2		3
C316	2.4	3	2.4		2							2		3

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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
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
C317	3	2.25	2	2	2									3

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YEAR : II   **SEM:** I   **REGULATION :** R19   **BATCH:** 2019-23

After completion of the course the students will be able to

NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Digital Signal Processing Lab	C318.1	Write and implement code to perform various operations on signals and verify the results using MATLAB software.	Apply
	C318.2	Implement and design IIR and FIR digital filters to analyze and detect frequency response using MATLAB software.	Apply
	C318.3	Simulate the programs and execute them on the DSP Starter Kit using Code Composer Studio Software tool.	Apply
	C318.4	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
C318.1	3	3	3	3	3								2	
C318.2	3	3	3	3	3								2	
C318.3	3	3	3	3	3								3	
C318.4	3	3	3	3	3								3	
C318	3	3	3	3	3								2.5	

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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
Intellectual Property Rights (IPR) & Patents	C319.1	Examine the different types of intellectual property rights to evaluate their significance and implications in various fields.	Analyze
	C319.2	Utilize the laws related to copyrights to assess and protect intellectual property in various contexts.	Apply
	C319.3	Assess patent laws in both national and international contexts to understand their implications and differences.	Analyze
	C319.4	Examine the trademark registration process and analyze the necessary maintenance measures for ensuring long-term protection.	Apply
	C319.5	Evaluate different trade secret protection mechanisms to understand their effectiveness and suitability in various business contexts.	Analyze
	C319.6	Employ cyber laws to protect against cybercrimes by implementing legal measures in practical scenarios.	Apply

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C319.1						2		3			1	1		
C319.2						2		3			1	1		
C319.3						2		3			1	1		
C319.4						2		3			1	1		
C319.5						2		3			1	1		
C319.6						2		3			1	1		
C319						2		3			1	1		

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Microwave and Optical Communication Engineering	C401.1	Utilize different modes in waveguide structures to analyze their behavior and performance in practical applications.	**Apply**
	C401.2	Evaluate connectors and splices in optical waveguides, and determine the fiber alignment joint loss in fiber joints.	**Analyze**
	C401.3	Apply the principles of optical sources and detectors to evaluate their performance in optical communication systems.	**Apply**
	C401.4	Calculate S-matrix for various waveguide components and Develop the splitting of the microwave energy in a desired direction	**Apply**
	C401.5	Analyze the differences between Microwave tubes and Solid State Devices to understand their characteristics and applications.	**Analyze**
	C401.6	Employ the principles of microwave theory to calculate various microwave parameters in practical scenarios.	**Apply**

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	3	3	3										3	
C401.2	3	3	3										3	
C401.3	3	3	3									2	3	
C401.4	3	3	3									2	3	
C401.5	3	3	3									2	3	
C401.6	3	3	3									2	3	
C401	3.00	3.00	3.00									2.00	3.00	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Data Communications & Computer networks	C402.1	Illustrate various data communication networks and their functions.	Apply
	C402.2	Design and analyze various error detection techniques.	Analyze
	C402.3	Demonstrate the mechanism of routing the data in network layer	Apply
	C402.4	Analyze the significance of various Flow control and Congestion control Mechanisms	Analyze
	C402.5	Examine the functioning of various application layer protocols to evaluate their roles and effectiveness in different network scenarios.	Analyze

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

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Digital Image and Video Processing	C403.1	Investigate the image formation model and fundamental concepts involved in digital image processing to process gray and color image data.	Analyze
	C403.2	Examine images by applying various transformation techniques to interpret and manipulate image data.	Analyze
	C403.3	Utilize the concepts of fundamental image enhancement algorithms in spatial and frequency domains, along with restoration techniques, to improve image quality.	Apply
	C403.4	Illustrate various coding techniques for image compression and detect Region of interest by applying segmentation techniques on gray and color images.	Apply
	C403.5	Design and develop various applications that incorporate different techniques of Image and Video processing	Create
	C403.6	Apply and explore new techniques in the areas of Image and Video Processing.	Apply

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	3	3	3										2	
C403.2	3	3	3										3	
C403.3	3	3	3										3	
C403.4	3	3	3										3	
C403.5	3	3	3										3	
C403.6	3	3	3										3	
C403	3	3	3										2.83333	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
Communication Standards and Protocols	C404.1	Examine and contrast the concepts of Signals, OSI, and TCP/IP reference models, and analyze the functionalities of each layer in these models.	Analyze
	C404.2	Investigate and analyze the flow control and error control mechanisms, and assess their application using standard communication protocols.	Analyze
	C404.3	Implement wired and wireless communication protocols to efficiently communicate data in practical scenarios.	apply
	C403.4	Examine and analyze the use of wireless communication protocols to assess their efficiency and effectiveness in data transmission.	Analyze
	C404.5	Evaluate the features and operations of various network security protocols such as NAT, PAT, and DNS, and assess the application of various routing algorithms to determine the shortest paths for packet delivery.	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	2	2	1										3	
C404.2	2	2											2	
C404.3	2	2											3	
C403.4	2	2											2	
C404.5	2	2		2									2	
C404	2.00	2.00	1.00	2.00									2.40	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
LOW POWER VLSI	C405.1	apply theoretical knowledge of power dissipation mechanisms and short-channel effects to optimize real-world circuit designs, balancing performance, power consumption, and reliability in modern semiconductor technologies.	Apply
	C405.2	**analyze** and evaluate the impact of leakage currents in low-power circuit designs	Analyze
	C405.3	**apply** various low-power design approaches, including voltage scaling, architectural techniques, and power management strategies, to practical circuit and system design.	Apply
	C405.4	**evaluate** and **develop** low-voltage, low-power combinational circuits, applying various design techniques to reduce power consumption while ensuring functionality and performance in practical applications.	Analyze
	C405.5	Analyze the functionality of Low- voltage low -power memories	Analyze

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					2				3
C405.2	2	2	2							2				3
C405.3	2		2		2					2				3
C405.4		3			3					2				3
C405.5		3			3					2				3
C405	2.00	2.67	2.00		2.50					2.00				3.00

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Internet of Things Lab	C406.1	**apply** knowledge of the Internet of Things (IoT), ARDUINO, RASPBERRY PI, and NODE MCU to design, implement, and troubleshoot IoT-based systems.	Apply
	C406.2	Implement interfacing of various sensors with Arduino/Raspberry Pi.	Apply
	C406.3	Demonstrate the ability to transmit data wirelessly between different devices.	Apply
	C406.4	Design and develop Mobile Application which can interact with Sensors and Actuators	Create

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	3	3	3	3	3							2		3
C406.2	3	3	3	3	3							2		3
C406.3	3	3	3	3	3							2		3
C406.4	3	3	3	3	3							2		3
C406	3.00	3.00	3.00	3.00	3.00							2.00		3.00

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Microwave and Optical Communication Engineering LAB	C407.1	Utilize the Gunn diode characteristics with a Gunn power supply to perform practical experiments and evaluate its performance.	Apply
	C407.2	Examine the attenuation, impedance, frequency, and radiation patterns of Horn and Parabolic antennas using the X-band Microwave bench to assess their performance characteristics.	Analyze
	C407.3	Analyze the scattering parameters of a Circulator and Magic Tee using the X-band microwave bench to evaluate their performance and operational characteristics.	Analyze
	C407.4	Apply the principles of directional couplers and reflex klystron characteristics to conduct practical experiments and analyze their performance in real-world scenarios.	Apply
	C407.5	Utilize HFSS to design and synthesize microstrip antennas for practical applications and evaluate their performance.	Apply
	C407.6	Analyze the characteristics of LED and laser diodes, and evaluate the measurement of Numerical Aperture (NA), losses in an analog optical link, and data rate in a digital optical link to assess their performance in optical communication systems.	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	
C407	3.00	3.00	3.00	3.00	3.00								2.67	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
WIRELESS COMMUNIC ATION	C409.1	Implement knowledge of wireless systems and standards (1G, 2G, 3G) to assess their application and performance in practical communication environments.	Apply
	C409.2	Analyze the concept and performance of CDMA-based wireless networks to evaluate their efficiency and application in modern communication systems.	Analyze
	C409.3	Evaluate the design of a system with transmit and receive diversity to assess its performance, efficiency, and reliability in varying communication environments.	Evaluate
	C409.4	Apply knowledge of modern wireless systems using OFDM (Orthogonal Frequency Division Multiplexing) to analyze their functionality and performance in practical communication systems.	Apply
	C409.5	Analyze satellite-based wireless systems to evaluate their functionality, performance, and efficiency in global communication networks.	Analyze

CO-PO & CO-PSO Mapping Table:

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409.1	3.00	2.00	1.00							2.00			3.00	
C409.2	3.00	2.00	1.00							2.00			3.00	
C409.3	3.00	2.00	1.00	2.00						2.00			3.00	
C409.4	3.00	2.00	1.00	2.00						2.00			3.00	
C409.5	3.00	2.00	2.00	2.00						2.00			3.00	
C409	3	2	1.2	2						2			3	

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NAME OF THE COURSE	CO#	COURSE OUTCOME STATEMENTS	BLOOMS TAXANOMY LEVEL
BLOCK CHAIN TECHNOLOGY	C410.1	Apply the foundational concepts of blockchain technology to implement processes in payment and funding systems, and analyze their real-world applications.	Apply
	C410.2	Examine and assess the design and functionality of applications based on blockchain technology to determine their impact and effectiveness across various domains.	Analyze
	C410.3	Apply knowledge to design, build, and deploy smart contracts and distributed applications, utilizing blockchain technology for practical use cases.	Apply
	C410.4	Evaluate the functional and operational aspects of the cryptocurrency ecosystem to assess its efficiency, security, and impact on financial systems.	Evaluate
	C410.5	Analyze strategies for profiting from cryptocurrency trading by examining market trends, risk factors, and trading techniques.	Analyze

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	1	1							2			3	
C410.2	2	1	1							2			3	
C410.3	3	2	1							2			3	
C410.4	3	2	1							2			3	
C410.5	3	2	2							2			3	
C410	2.6	1.6	1.2							2			3	

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