Criterion 2 – Teaching Learning and Evaluation

Key Indicator 2.6 – Students Performance and Learning Outcomes

2.6.1. Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated

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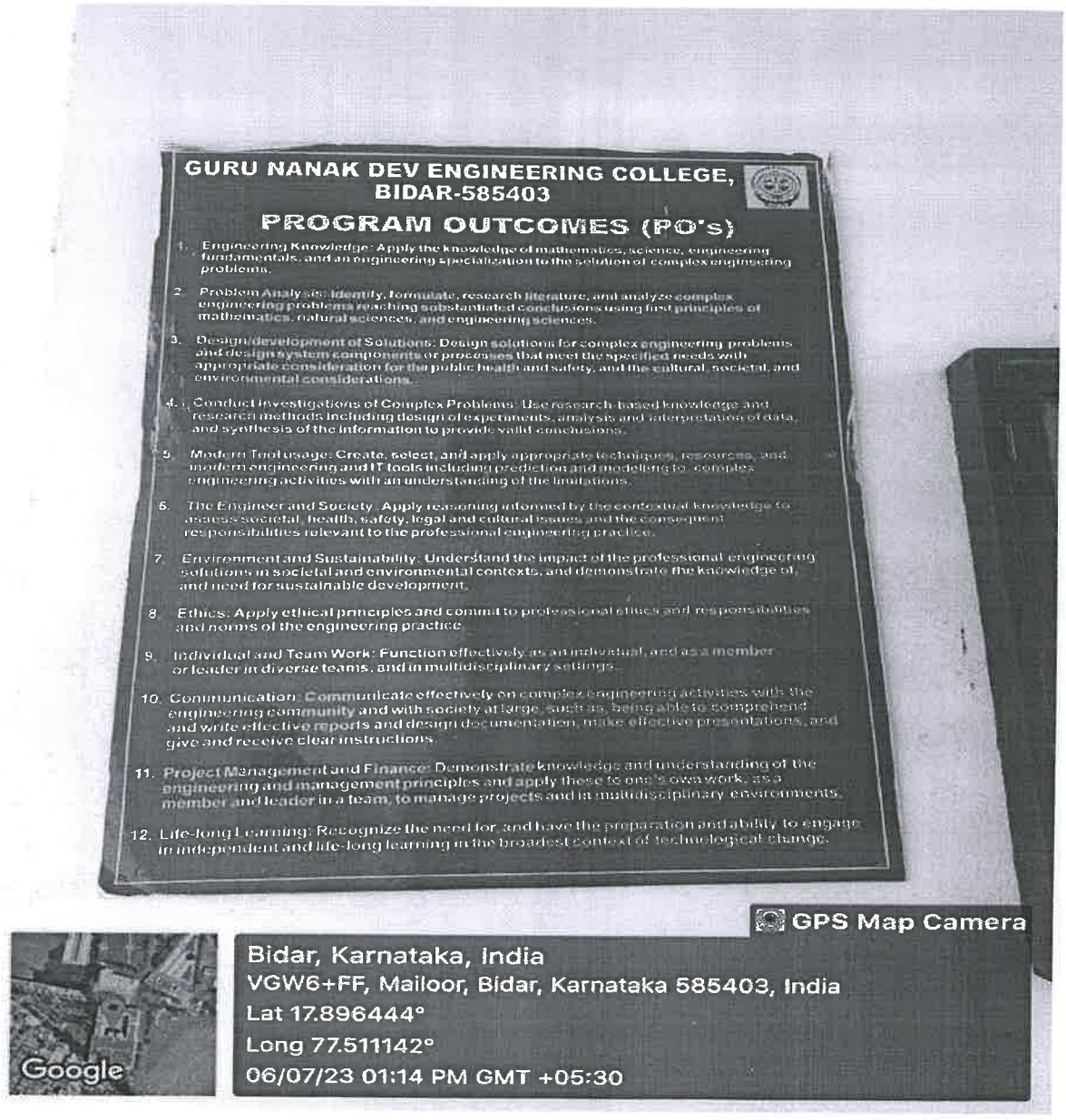
GURU NANAK DEV ENGINEERING COLLEGE, BIDAR

Department of ECE Engineering



PROGRAM OUTCOME

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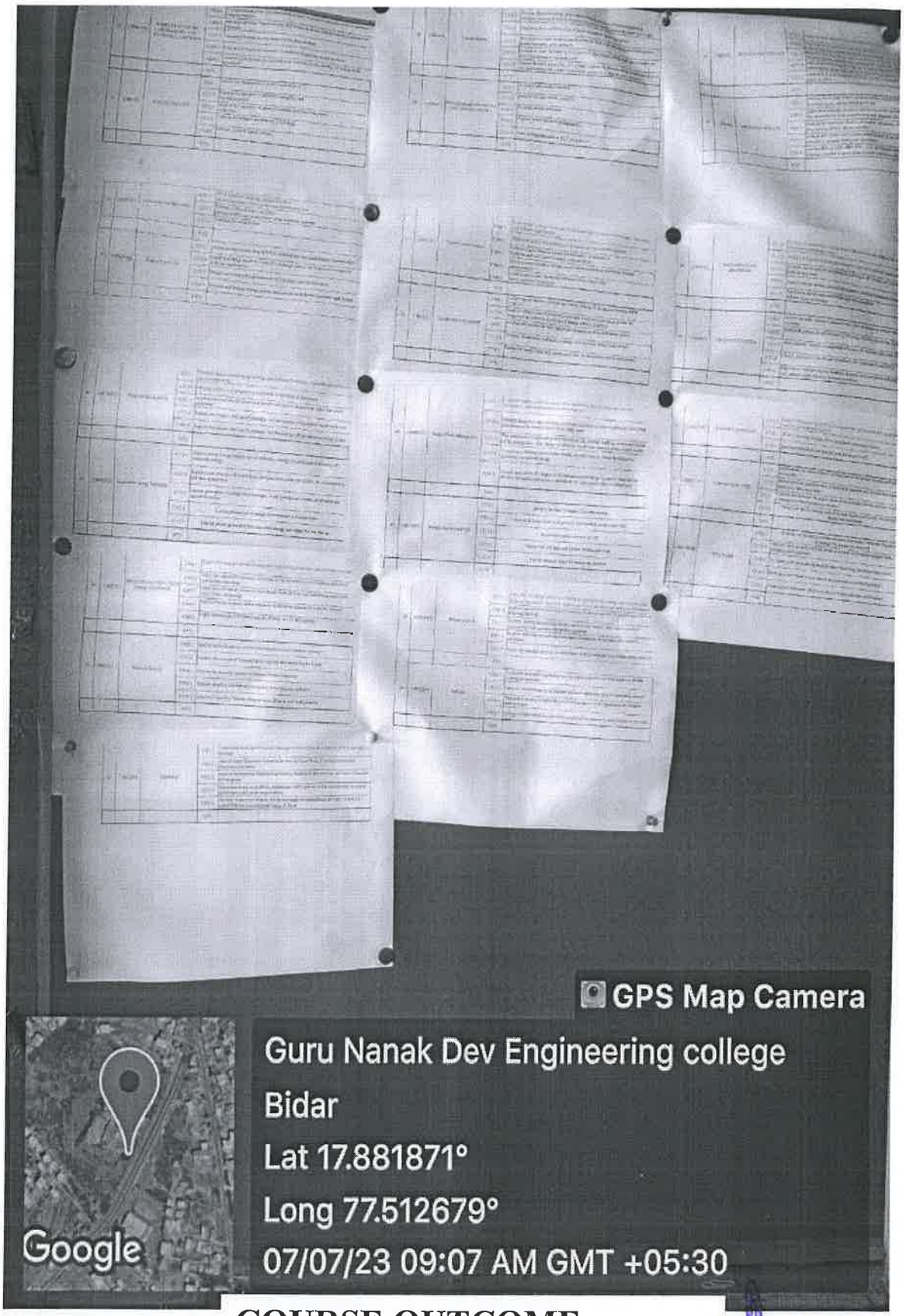

COURSE OUTCOME

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Guru Nanak Dev Engineering College ,Bidar
Dept. of Electronics and Communication Engg.
2018 Scheme COPO Mapping

Sl. No.	Course Code	Course Name	Course	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
17	(18ELN15)	Basic Electronics	C105.1	Describe the operation of semiconductor diodes and analyze their applications	3	2										1	1	
			C105.2	Explain the construction and operation of JFET,MOSFET, and SCR and analyze the	3	1										1	1	
			C105.3	Explain the basic operation of op-amp and analyze the performance parameters in different applications	3	3										1	1	
			C105.4	Analyze the applications of BJT, Feedback amplifier and Oscillators to find output waveforms.	3	3										1	1	
			C105.5	Explain basics of Communication System and different Number system with their conversions and	3											1	1	
			Avg.		3	2.3										1	1	
18	18MAT31	Transform Calculus, Fourier Series & Numerical Techniques	C201.1	Apply Laplace Transform and inverse Laplace Transforms in solving differential equations.	3	1										1		
			C201.2	Apply Fourier series to study periodic functions & their applications.	3	1										1		
			C201.3	Illustrate discrete and continuous functions by using Fourier Transforms & Z transforms.	3	1										1		
			C201.4	Solve first order ordinary differential equations arising in engineering problems using single step &	3	1										1		
			C201.5	Determine the numerical solutions for second order ODE's & extremals of functional using calculus of	3	1										1		
			AVG		3	1										1		

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19	(18EC32)	Network Analysis	C202.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal	3	3										1	1		
			C202.2	Apply Network Theorems and electrical laws to reduce circuit complexities to arrive at feasible	3	1			1							1	1		
			C202.3	Analyze the electrical network under initial conditions to find voltages and currents.	2	3										1	1		
			C202.4	Apply Laplace Transform to solve electrical networks.	3	2										1	1		
			C202.5	Analyze the given network using specified two port network parameters and evaluate for	3	3										1	1		
			AVG		2.8	2.4			1							1	1		
20	(18EC33)	Electronics Devices	C203.1	Explain the principles of semiconductor Physics	3											1	1		
			C203.2	Apply the concept of semiconductors, to construct pn junction.	3											1	1		
			C203.3	Apply the concept of semiconductors, to construct BJT's.	3											1	1		
			C203.4	Apply the concept of semiconductors,to construct FET.	3											1	1		
			C203.5	Discuss fabrication of pn junctions and MOS transistors for integrated circuits.	3											1	1		
			AVG.		3											1	1		
21	(18EC34)	Digital System Design	C204.1	Apply the concept of reduction techniques to solve the boolean expression using k-map, quine	3											1	1		
			C204.2	Analyze and design of combinational logic circuits.	1	2	3									1	2		
			C204.3	Analyze sequential logic circuits & its applications	2	3										1	2		
			C204.4	Design sequential circuits	1	2	3									1	2		
			C204.5	Analyze & design application of digital circuits	1	2	3									1	2		
			AVG.		1.6	2.2	3									1	1.8		

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22	(18EC35)	Computer Organisation and application	C205.1	Explain the basic organization of computer System.	3											1		1
			C205.2	Explain sequences of machine Instructions in the Computer system, and concepts of the register	3											1		1
			C205.3	Explain the different ways of accessing an input / output device, and interrupts in computer system	3											1		1
			C205.4	Explain Memory system and analyze its organization in a computer system.	3											1		1
			C205.5	Explain processor organization, and analyze hardwired and micro programmed control systems.	3											1		1
23			AVG.		3											1		1
	(18EC36)	Power Electronics and Instrumentation	C206.1	Construct power electronics circuits and explain its operations	3											1	1	
			C206.2	Analyze and explain the operation of controlled rectifiers and DC to DC converter	2	3										1	1	
			C206.3	Construct & explain the various circuits for measuring voltage and current.	3											1	1	
			C206.4	Construct Bridge circuits to measure passive component values and frequency.	3											1	1	
			C206.5	Explain the operation of transducers used in measurement.	3											1	1	
24			AVG.		2.8	3										1	1	
	(18ECL37)	Electronic Devices and Instrumentation Laboratory	C207.1	Demonstrate the characteristics of various electronic devices and measurements of parameters	3	1							2			1	1	
			C207.2	Design and test simple electronic device circuits.	1	2	1						2			1	1	
			C207.3	Use of circuit simulation software for the implementation and characterization of electronic devices and circuit	2	1			3				2			1	1	
			AVG.		2	1.3	1		3				2			1	1	

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25	(18ECL38)	Digital Systems and Design Laboratory	C208.1	Design and test various combinational circuits such as adders,subtractors,comparators,multiplerxers.	1	2	3						1			1	1		
			C208.2	Solve and realize boolean expressions using decoders.	1	2							1			1	1		
			C208.3	Construct and test flipflops,counters and shift registers.	1	2	3						1			1	1		
			C208.4	Simulate full adder and up/down counters.	1	2	3		2				1			1	1		
			AVG.		1	2	3		2				1			1	1		
26	(18MAT41)	COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS	C209.1	Use the concept of analytic function & concept of complex potential to solve problems of complex	3	2										1			
			C209.2	Analyze conformal Transformation & Evaluate Bi-linear transformation, Complex line integrals.	3	2										1			
			C209.3	Determine Probability Distribution of random variables.	3	2										1			
			C209.4	Find various Statistical measures, Correlation-Regression & fitting curves.	3	2										1			
			C209.5	Construct joint probability distribution & Demonstrate the validity of Testing of the	3	2										1			
			AVG.		3	2										1			
27	(18EC42)	ANALOG CIRCUITS	C210.1	Explain the characteristics of BJTs and MOSFET's.	3												1		
			C210.2	Explain the operation of MOSFETs amplifier and Oscillator circuits	3												1		
			C210.3	Analyze the operation of general feedback amplifiers and power	3	2											1		
			C210.4	Analyze the different applications of OP-Amp.	3	2											1		
			C210.5	Analyze linear IC based circuits.	3	2											1		
			AVG.		3	2											1		

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28	(18EC43)	Control System	C211.1	Develop the mathematical model of mechanical,electrical,electromechanical &	3	2										1	1	
			C211.2	Determine the transfer function of block diagram & signal flow graph.	2	3										1	1	
			C211.3	Determine the time response specifications for first order system,second order system, steady state error,	2	3										1	1	
			C211.4	Analyze & verify the stability of a system in time domain using routh hurtwiz criterian, root locus	2	3										1	1	
			C211.5	Analyze & verify the stability of a system in frequency domain using nyquist plot & polar plot	2	3										1	1	
			AVG.		2.2	2.8										1	1	
29	(18EC44)	ENGINEERING STATISTICS and LINEAR ALGEBRA	C212.1	Analyze single random variables.	2	3												
			C212.2	Analyze multiple random variables	2	3												1
			C212.3	Examine random processes	2	3												1
			C212.4	Analyze vector spaces & orthogonality	2	3												1
			C212.5	Analyze diagonalization & SVD wrt matrices	2	3												1
			AVG		2	3												1
30	(18EC45)	SIGNALS AND SYSTEMS	C213.1	Analyze & draw different types of signals & systems.	2	3										1	1	
			C213.2	Determine the properties of continuous and discrete time systems & analyze & find the output of the	2	3										1	1	
			C213.3	Determine the properties of systems & analyze & find the output of continuous in time & frequency	2	3										1	1	
			C213.4	Analyze & find the output of discrete in time & frequency domain using fourier representation of	2	3										1	1	
			C213.5	Analyze & find the output of LTI system using Z-transform & test whether the system is causal &	2	3										1	1	
			AVG.		2	3										1	1	

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31	(18EC46)	MICROCONTROLLER	C214.1	Analyze the working of 8051 microcontroller architecture and	3	3										1	1	
			C214.2	Apply the knowledge of various addressing modes and instructions of 8051 microcontroller to write	3	1										1	1	
			C214.3	Analyze the working of Stacks, subroutine instructions, I/O Port Interfacing and programming	3	3										1	1	
			C214.4	Analyze 8051 timers and counters operation and Write assembly language and C programs to	1	3										1	1	
			C214.5	Interface 8051 to ADC-0804, DAC, LCD and Stepper motors and Write 8051 Assembly language	1	3										1	1	
			AVG.		2	2.8										1	1	
32	(18ECL47)	Microcontroller Laboratory	C215.1	Write Assembly language programs in 8051 for solving simple problems that manipulate input	3				1							1	1	
			C215.2	Interface different input and output devices to 8051 and control them using Assembly	3				1							1	1	
			C215.3	Interface the serial devices	3				1							1	1	
			AVG.		3				1							1	1	
33	(18ECL48)	Analog Circuits lab	C216.1	Design analog circuits using BJT/FET and evaluate their performance characteristics.	1	2	1					1	2			1	1	
			C216.2	Apply knowledge about the linear IC's to design various Op Amp based circuits for different	2	1	1					1	2			1	1	
			C216.3	Design and Analyze the performance of Oscillators and multivibrators.	1	2	1					1	2			1	1	
			C216.4	Simulate and analyze analog circuits that uses Ics for different electronic applications	2	2	1		3			1	2			1	1	
			AVG.		1.5	1.8	1		3			1	2			1	1	

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34	(18EC51)	TIM&E	C301.1	Explain Management, planning, Organizing, Staffing, Recruitment and Basic functions,	1									2		1	1	
			C301.2	Summarize the organizing, staffing ,directing, controlling activities of management required for an	1	1								2		1		
			C301.3	List the Social responsibilities of Business and	1	2	1			1	1		1		1	1		
			C301.4	Explain the Importance of Family Business and Idea	2	1							1		1	1		
			C301.5	Explain the Business models, financial and network	2	2									1	1		
			AVG.		1.4	1.5	1			1		1	1	1.6	1	1	1	
35	(18EC52)	Digital Signal Processing	C302.1	Analyze frequency domain sampling, reconstruction of discrete	3	2										1		1
			C302.2	Analyze linear filtering methods based on DFT & also FFT	2	3										1		1
			C302.3	Design FIR filters using windowing technique	1	2	3									1		1
			C302.4	Design IIR filters using BLT	1	2	3									1		1
			C302.5	Explain DSP processor architecture	3											1		1
			AVG.		2	2.3	3									1		1
36	(18EC53)	PCS	C303.1	Analyze and explain the performance of amplitude modulation	2	3										1	1	
			C303.2	Analyze and explain various Angle modulation schemes used in	1	3										1	1	
			C303.3	Analyze and explain performance of various communication	3	1										1	1	
			C303.4	Explain analog signals in terms of digital using various	3	2										1	1	
			C303.5	Analyze and explain quantization process with examples,	3	1										1	1	
			AVG.		2.4	2										1	1	

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37	(!8EC54)	IT&C	C304.1	Determine measure of information, Entropy, Rate of Information of Independent & dependent sequences	2	3										1		1
			C304.2	Design source coding using algorithms.	1	1	3									1		1
			C304.3	Determine the different entropies of continuous and discrete communication channels.	2	3										1		1
			C304.4	Design the encoding and decoding circuits for Linear Block codes, cyclic codes.	1	2	3									1		1
			C304.5	Design the encoding and decoding circuits for Convolution codes.	1	2	3									1		1
			AVG.		1.4	2.2	3									1		1
38	(18EC55)	EMW	C305.1	Applying coulomb's law, derive electrostatic force, and electric field due to point and multiple charges.	3											1	1	
			C305.2	Derive electric field intensity, flux density by using Gauss Law, Divergence Theorem, analyze & explain	1	3										1	1	
			C305.3	Analyze & explain laws of magnetic fields and determine charge and capacitance by using	1	3										1	1	
			C305.4	Derive force on a moving charge, differential current elements, Force between differential current	3											1	1	
			C305.5	Analyze Time-varying fields, Maxwell's equations, wave propagation in free space and derive	3	2										1	1	
			AVG.		2.2	2.6										1	1	
39	(18EC56)	Verilog HDL	C306.1	Apply basic concepts of digital electronics, hierarchical modeling concepts and design	3											1	1	
			C306.2	Explain the Lexical Conventions, Verilog-HDL data types and declaration of ports and Modules.	3											1	1	
			C306.3	Analyze and explain the Gate level Modeling and Data flow	2	3										1	1	
			C306.4	Analyze and explain the Behavioral modeling and identify the different tasks and functions	2	3										1	1	
			C306.5	Analyze and explain the different Modeling	1	3										1	1	
			AVG.		2.2	3										1	1	

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40	(18ECL57)	DSP LAB	C307.1	Analyze sampling theorem for sampling & reconstuction	2	3			3							3		1
			C307.2	Apply in built function of matlab to write program for DFT & IDFT	3				3							3		1
			C307.3	Analyze linear & circular convolution to determine system output.	2	3			3							3		1
			C307.4	Design FIR & IIR filters using windowing and bilinear	2	2	3		3							3		1
			AVG.		2.25	2.7	3		3							3		1
41	(18ECL58)	HDL LAB	C308.1	Model digital circuits using hard ware description language ,verilog HDL and validate its functionality.	2	3	1		3							1		1
			C308.2	Design combinational and sequential circuits and verify the output.	1	2	3		3							1		1
			C308.3	Interface the hard ware to the programmable chips and obtain the required output.	2	3	1		3							1		1
			AVG.		1.6	2.6	1.6		3							1		1
42	(18ECL61)	Digital Communication	C309.1	Analyze and Illustrate the theory of bandpass signal to equivalent lowpass , line codes and different High	3	2												2
			C309.2	Analyze & explain the performance of signaling over AWGN Channels.	2	3												2
			C309.3	Analyze Digital Modulation and Demodulation techniques in	3	3												2
			C309.4	Analyse communication through band limited channels to determine channel characteristics.	1	3												2
			C309.5	Analyze and explain the digital communication system with	2	3												2
			AVG		2.2	2.8												2

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43	(18EC62)	EMBEDDED SYSTEMS	C310.1	Explain the architecture features and instructions of 32 bit microcontroller ARM CORTEX	3											1	1	1
			C310.2	Analyze ARM Cortex M3 Instruction set and Apply the knowledge gained for Programming ARM	3	2										1	1	1
			C310.3	Analyze and explain the basic hardware components of an embedded system.	3	2										1	1	1
			C310.4	Develop the hardware /software co-design and firmware design approaches	3	1			2							1	1	1
			C310.5	Explain the need of real time operating system for embedded system applications.	3	1										1	1	1
			AVG		3	1.5			2							1	1	1
44	(18EC63)	MICROWAVE and ANTENNAS	C311.1	Analyze the transmission line equations with solutions and Explain the fundamentals of	3	2										1		1
			C311.2	Analyze & Explain S-parameters related to microwave network theory and waveguides	2	3										1		1
			C311.3	Analyze various antenna parameters for building an RF system and Explain different types of strip lines .	1	3										1		1
			C311.4	Analyze various antenna patterns and determine radiation resistance of the antenna.	1	3										1		1
			C311.5	Analyze the design parameters of the antenna and explain	1	3										1		1
			AVG		1.6	2.8										1		1
45	(17EC641)	OPERATING SYSTEM	C312.1	Explain the goals, structure, operation and types of operating systems and their working principle.	3											1		1
			C312.2	Analyze & explain the performance of OS using different scheduling techniques.	2	3										1		1
			C312.3	Apply suitable memory management techniques for memory allocation in OS.	3											1		1
			C312.4	Classify and explain file allocation methods, file organization and IOCS.	3											1		1
			C312.5	Make use of message passing, deadlock detection and prevention methods to implement Inter process	3											1		1
			AVG		2.8	3										1		1

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46	(18CS653)	Programming in JAVA	C313.1	Describe object-oriented programming and different Data types, Variables, and Arrays in Java															
			C313.2	Develop simple Java programs using operators and control statements	3											1		1
			C313.3	Analyze the concepts of Classes and Inheritance in Java programs to solve real world problems.	3											1		1
			C313.4	Explain the creation and use of packages, and the concept of exception handling in Java	3	3			1							1		1
			C313.5	Explain the creation and use of packages, and the concept of exception handling in Java	3											1		1
			AVG		3	3			1							1		1
47	(18EE653)	Renewable Energy Resources	C313.1	Explain causes energy scarcity and its solutions, energy resources and availability of renewable energy.	3	2				1	1	1				1		1
			C313.2	Explain types of solar collectors, their configurations, solar cell system, its characteristics and their applications.	3	2				1	1	1				1		1
			C313.3	Explain generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.	3	2				1	1	1				1		1
			C313.4	Explain production of energy from biomass and ocean tides.	3	2				1	1	1				1		1
			C313.5	Explain power generation from sea wave energy and ocean thermal energy.	3	2				1	1	1				1		1
			AVG		3	2				1	1	1				1		1

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48	(18ME653)	Supply Chain Management	C313.1	Understand and explain the supply chain importance, key decisions and business strategies to improve performance and reduce cost.	3													
			C313.2	Interpret theoretical logic for make versus buy decisions to select supplier by identifying core processes to create a world-class supply base.	2	3												
			C313.3	Plan warehouse management system by controlling material handling, transportation and traffic	2		3											
			C313.4	To develop a Network optimization model, decision trees to reduce the impact of uncertainty on network design.	2		3											
			C313.5	Use and application of integration of information technology in supply chain for the effective forecasting and reduced uncertainty for agile supply chain management.			3		3									
			AVG		2.2	3	3		3									

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49	(18CV651)	Remote Sensing and GIS	C313.1	Interpret the basic concepts of remote sensing.	3	1										1		3
			C313.2	Analyze different features of ground information to create raster data.	3	2										1		3
			C313.3	Interpret the basic concepts of GIS	3	1										1		3
			C313.4	Extract the GIS data and prepare the thematic maps	3	1	1									1		3
			C313.5	Use the thematic maps for various applications	3	1	1			2	2					1		3
			AVG		3	1.2	1			0.5	0.5					1		3
50	(18ECL66)	Embedded Systems Lab	C314.1	Explain instruction set of 32 bit microcontroller ARM cortex M3 and software Tool required for	3				1			1	1	1	1	1		1
			C314.2	Write C language program for an embedded system applications.	3				1			1	1	1	1	1		1
			C314.3	Interface external devices and I/O with ARM cortex M3.	2	3			1			1	1	1	1	1		1
			AVG		2.6	3			1			1	1	1	1	1		1
51	(18ECL67)	Communication LAB	C315.1	Demonstrate the characteristics and response of microwave devices and optical waveguide.	3	2	1	1				1	1	1	1	1	1	1
			C315.2	Demonstrate the characteristics of microstrip antennas and devices and compute the parameters	3	2	1	1				1	1	1	1	1	1	1
			C315.3	Compile and Simulate the digital modulation schemes with the display of waveforms and	3	2	1	1	1			1	1	1	1	1	1	1
			C315.4	Design and test the analog modulation and digital modulation circuits/systems and display the	3	2	1	1				1	1	1	1	1	1	1
			AVG		3	2	1	1	1			1	1	1	1	1	1	1

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52	(18ECMP68)	Mini Project	C316.1	Students will be able to practice acquired knowledge within the chosen area of technology for	3	1	2	3	-	3	2	2	3	3	2	2	3	3
			C316.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive approach.	3	2	2	1	2	2	2	2	3	2	2	2	3	3
			C316.3	To impart skills in preparing detailed report describing the project and results.	2	2	1	1	1	1	1	1	2	2	1	2	3	3
			C316.4	Work as an individual or in a team in development of technical projects.	-	-	-	-	-	3	3	1	3	3	3	2	3	3
			C316.5	Communicate and report effectively project related activities and findings.	2	2	1	-	-	-	-	1	3	3	3	2	3	3
			AVG		2.5	1.8	1.5	2	2	2.25	2	1.4	2.8	2.6	2.2	2	3	3
53	(18EC71)	COMPUTER NETWORKS	C401.1	Understand the concepts of networks and network models	3	2										1		1
			C401.2	Identify the protocols and services of different layers with wired and wireless LAN	2	3										1		1
			C401.3	Distinguish the basic network configurations and standards associated with each network with	1	2	3									1		1
			C401.4	Analyze transport layer and its protocols of the networks with TCP services	2	3										1		1
			C401.5	Analyze a simple network and measurement of its parameters.	3	2										1		1
			AVG		2.2	2.4	3									1		1

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54	(18EC72)	VLSI DESIGN	C402.1	Apply the fundamentals of semiconductor Physics in MOS	3											1	3	
			C402.2	Analyze the Boolean functions for designing Schematic,Stick	1	2	3		3							1	2	1
			C402.3	Analyze the CMOS Subsystem design process and Explain the	3	3			2							1	2	1
			C402.4	Explain FPGA based Architectural issues with the design	3											1	2	1
			C402.5	Verify and Test the Logic circuits, Explain Memory,Registers	3				2							1	3	1
			AVG		2.6	2.5	3		2							1	2.4	1
55	(18EC734)	DSP Algorithms and Architecture:	C403.1	Apply the basic concepts of DSP techniques, Computation of DFT & IDFT using FFT algorithms	3											1	1	
			C403.2	Analyze the Architectures for Programmable DSP Devices.	1	3										1	1	
			C403.3	Analyze the Addressing modes & Programming of DSP Processor.	3	3										1	1	
			C403.4	Develop the basic Algorithms using DSP Processor.	3											1	1	
			C403.5	Explain the memory interfacing & applications of DSP Processor.	2											1	1	
			AVG		2.4	3										1	1	

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56	(18EC744)	Cryptography	C404.1	Identify the different Cryptographic techniques and number theory algorithms for network	3											1		
			C404.2	Analyze symmetric Cryptographic algorithms to secure the data.	2	3					1	1				2		
			C404.3	Analyze the concepts of Number theory and finite fields theorems used in Cryptographic	2	3										2		
			C404.4	Analyze various public key algorithms to provide network security	2	3					1	1				2		
			C404.5	Analyze Pseudo random sequence generators using stream ciphers for data security	3											2		
			AVG		2.2	3	1				1	1				1.8		
58	(18ECL76)	Communication lab	C406.1	Use the network simulator for learning and practice of networking algorithms.	2	2	3	1	3				2	2	1	1		1
			C406.2	Illustrate the operations of network protocols and algorithms using C programming.	2	2	3	1	3				2	2	1	1		1
			C406.3	Simulate the network with different configurations to measure the performance parameters.	2	2	3	1	3				2	2	1	1		1
			C406.4	C706.4 Implement the data link and routing protocols using C programming.	2	2	3	1	3				2	2	1	1		1
			AVG		2	2	3	1	3				2	2	1	1		1
59	(18ECL77)	VLSI lab	C407.1	Draw & simulate various CMOS circuits.	3	1			3								1	
			C407.2	Create the layout for CMOS circuits & Verify DRC, ERC & LVS.	2	3			3								1	
			C407.3	Develop the Verilog code and Test bench to synthesize various Digital circuits.	1	2			3								1	
			AVG		2	2			3								1	

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60	(18ECP78)	Project Work Phase 1	C408.1	Construct problem statement by investigating various complex problem situations involving	3	3	2	3	-	3	2	2	3	2	2	2	3	3
			C408.2	Conduct literature survey, define the problem and device methodology to address the problem	3	2	2	-	1	1	1	2	3	2	2	2	3	3
			C408.3	Identify and select tools for implementation of project.	2	2	1	1	3	1	1	2	2	1	1	2	3	3
			C408.4	Work in groups to promote effective communication, team spirit and leadership quality in	-	-	-	-	-	3	3	3	3	3	2	2	3	3
			C408.5	Estimate the optimum cost of implementation	1	-	-	-	-	1	2	1	1	1	3	2	3	3
			C408.6	Communicate technical and general information verbally and literally	2	2	1	-	-	-	-	2	2	3	1	2	3	3
			AVG		2.2	2.3	1.5	2	2	1.8	1.8	2	2.3	2	1.8	2	3	3

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61	(18EC81)	WIRELESS AND CELLULAR COMMUNICATION	C409.1	Explain the concept of radio propagation and fading parameters over wireless channels.	3															
			C409.2	Apply the concept of communication theory both physical and networking associated with GSM	3															
			C409.3	Apply the concept of communication theory both physical and networking associated with CDMA	3															
			C409.4	Explain the key enablers and multicarrier modulation concept for LTE 4G systems.	3															
			C409.5	Apply the concept of OFDMA and SC-FDMA in LTE 4G systems.	3															
			AVG		3															
62	(18EC821)	Network Security	C410.1	Explain network security services and mechanism and security concepts	3												1	1	1	
			C410.2	Explain the concept of Transport level security and secure Socket Layer.	3												1	1	1	
			C410.3	Explain the Security concern in Internet Protocol Security	3												1	1	1	
			C410.4	Explain Intruders and Intrusion detection and malicious software.	3												1	1	1	
			C410.5	Describe Firewalls, Firewall characteristics, Biasing and configuration	3												1	1	1	
			AVG		3												1	1	1	
63	(18ECP83)	Project phase II	C411.1	Formulate and design alternate solutions using suitable technology and algorithm and carry out	3												1		3	
			C411.2	Explore new problem areas and technologies to implement R & D projects and cultivate life-long	2	3			1								1		3	
			C411.3	Explain security associations, security policies and modes. Also outline services provided by ESP	3				1								1		3	
			C411.4	Explain cyber security concepts and apply antipatterns for solving cyber security problems.	3				1								1		3	
			C411.5	Apply the concepts of cyber security frame work in computer system and administration.	3				1								1		3	
			AVG		2.8	3			1								1		3	

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64	(18ECS84)	Seminar	C412.1	To identify and select significant seminar topics of his/her interest related to the real working	3	2		1		3	1	2	3	3	1	3		
			C412.2	Carry out literature survey of relevant area and categorize them in systematic manner.	3								3	3	1	2		
			C412.3	Take part in writing technical document and prepare a well organized and compiled seminar report.	3	2							3	3		3		
			C412.4	Give presentation related to the work completed and answer to query raised on the topic.	3	2					2	2	3	3		3		
			AVG		3	3		1		3	1.5	2	3	3	1	2.7		
65	(18ECI85)	Internship	C413.1	Understand the Engineering and Management principles as a member able to manage projects.	3					1		1	1	1	1	1		
			C413.2	Able to Apply Employer valued skills such as Team Work, Communication and Observation to detail.	3					1		1	1	1	1	1		
			C413.3	Analyze professional Engineering Domain, Responsibility practices and need of feasible	2	3				1		1	1	1	1	1		
			C413.4	Determine strong work ethics, professional behaviour as well as commitment to ethical	3					1		1	1	1	1	1		
			C413.5	Develop Awareness of need, ability to engage in independence and able to acquire himself for any	3					1		1	1	1	1	1		
			AVG		2.8	3				1		1	1	1	1	1		

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