‖JAI SRI GURUDEV‖
Sri AdichunchanagiriShikshana Trust (R)

SJB INSTITUTE OF TECHNOLOGY
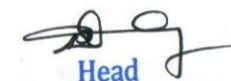BGS Health & Education City, Kengeri, Bangalore – 60.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX

BATCH 2018-22

SUBJECT NAME	Basic Electronics	SUBJECT CODE	18ELN14/24

	CO STATEMENTS
CO1	Describe the operation of diodes, BJT and FET. Describe general operating principles of SCR's and its application
CO2	Design and explain the construction of rectifiers, regulators, amplifiers and Oscillators.
CO3	Explain the working and design different types of operational amplifiers.
CO4	Explain the working and design of fixed voltage IC regulator using 7805 and Astable oscillator using timer IC 555. Understand the basic principle of operation of communication system and mobile phones.
CO5	Recall and explain the different number system and their conversions. Construct simple combinational and sequential circuits using flipflops

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2											2		
CO2	2	2	2										2		
CO3	2	2	2										2		
CO4	2		2										2		
CO5	2	2											2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Transform calculus, Fourier Series and Numerical Techniques	SUBJECT CODE	18MAT31
FACULTY NAME	Mrs. Chaitra A C / Mrs. Pushpa S /Mr. Sri Gowrav		

	CO STATEMENTS
CO1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
CO2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
CO5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2													
CO2	3	2													
CO3	3	2													
CO4	3	2													
CO5	3	2													

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

		SUBJECT CODE	18EC32

SUBJECT NAME	Network Theory	
FACULTY NAME	Dr. Vijayakumar T/ Mrs. Anitha P	CO STATEMENTS
CO1	Distinguish the networks and discuss various circuit analysis techniques.	
CO2	Analyze the circuit parameters during switching transients and apply Laplace transform to solve the given network	
CO3	Apply network theorems to solve a given network.	
CO4	Evaluate the frequency response for resonant circuits and the network parameters for two port networks	

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1										1		
CO2	1	2	1										1		
CO3	1	2	1										1		
CO4	2	2	1										1		

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SUBJECT NAME	Electronic Devices		SUBJECT CODE	18EC33
FACULTY NAME	Mr. Bhaskar B / Ms. Geethanjali			
	CO STATEMENTS			
CO1	Understand the principal of semiconductor physics			
CO2	Analyze and design-controlled rectifier and understand the principle and characteristics of different types of semiconductor devices			
CO3	Understand the fabrication process of semiconductor devices			
CO4	Utilizes the mathematical models of semiconductor functions and mos transistors for circuits and system			
CO5	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1										1		
CO2	3	2	1										1		
CO3	3	2	1										1		
CO4	3	2	1										1		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Digital System Design	SUBJECT CODE	18EC34
FACULTY NAME	Dr. K V Mahendra Prashanth / Dr. Ravikumar A V		

	CO STATEMENTS
CO1	Demonstrate the concept of combinational, sequential logic circuits and PLD
CO2	Design combinational logic circuits
CO3	Design the sequential circuits using SR, JK, D, T flip flops and Mealy & Moore machines
CO4	Design applications of combinational and sequential circuits.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
													2		
CO1	2												2		
CO2	3												1		
CO3	3												1		
CO4	3	2													

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

		SUBJECT CODE	18EC35
SUBJECT NAME	Computer Organization & Architecture		
FACULTY NAME	Dr. Komala M / Mrs. Uma S		

	CO STATEMENTS
CO1	Understand the basic Organization of computer, operational functional units and processor performance and analyze different instructions and addressing modes.
CO2	Identifying the input output devices and utilization of interrupts, controlling devices and memory
CO3	Understand, analyze and design the various memory systems
CO4	Analyzing the execution of complete instructions through hardwired and micro programmed Control

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
													2		
CO1	2	3	2										2		
CO2	2	2											2	2	
CO3	3	3	2										2		
CO4	2	2	1												

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SUBJECT NAME	Power Electronics & Instrumentation		SUBJECT CODE	18EC36
FACULTY NAME	Dr. Rekha K R / Dr. K Somashekar / Mrs. Chetana R			

	CO STATEMENTS
CO1	Build and test circuits using power electronic devices.
CO2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS.
CO3	Define instrument errors and develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency
CO4	Describe the principle of operation of Digital instruments and PLCs
CO5	Use Instrumentation amplifier for measuring physical parameters and transducer

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1						2				2		
CO2	1	2	1			1							2		
CO3	2	2	2										2		
CO4	2	1	1										2		
CO5	1	1		2		2	1						2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

		SUBJECT CODE	18ECL37
SUBJECT NAME	Electronic Devices & Instrumentation Laboratory		
FACULTY NAME	Mr. Bhaskar B, Dr. K Somashekar (A2), Mrs. Geethanjali (A1) Mrs. Geethanjali, Dr. Rekha K R (B2), Supriya (B1) Dr. K Somashekar, Mrs. Supriya M		

	CO STATEMENTS
CO1	Test circuits of rectifiers, clipping circuits, clamping circuits and voltage regulators.
CO2	Understand the characteristics of various electronic devices and measurement of parameters.
CO3	Design and test simple electronic circuits
CO4	Use of circuit simulation software for the implementation and characterization of electronic circuits and devices.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
													2		
CO1	3	2		2									2		
CO2	3	2		2									2		
CO3	2	2	3	3									2		
CO4	2	2		2	3										

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SUBJECT NAME	Digital System Design Laboratory		SUBJECT CODE	18ECL38
FACULTY NAME				
	CO STATEMENTS			
CO1	Demonstrate the truth table of various expressions and combination circuits using logic gates.			
CO2	Design and test various combination circuits such as adders, subtractors, comparators, mux and demuxer.			
CO3	Construct flip flop using universal gates.			
CO4	Explain operation of counter and shift registers.			
CO5	Simulate serial adder and binary multiplier			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2										2		
CO2	3	3	3										2		
CO3		2	2									3	2		
CO4			3									3	2		
CO5		2	3		3										

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SUBJECT NAME	Complex Analysis, Probability and Statistical Methods	SUBJECT CODE	18MAT41
FACULTY NAME	Mrs. Chaitra A C / Mrs. Geetha B S / Mrs. Pushpa S		

	CO STATEMENTS
CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory
CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing
CO3	Apply discrete and continous probability distributions in analysing the probability models arising in engineering field.
CO4	Make use of correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2											2		
CO2	2	2											2		
CO3	2	2											2		
CO4	2	2											2		
CO5	2	2											2		

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SUBJECT NAME	Analog Circuits		SUBJECT CODE	18EC42
FACULTY NAME	Dr. K R Rekha / Dr. Anitha P			

	CO STATEMENTS
CO1	Understand the characteristics of BJTs and FETs.
CO2	Design and analyze the BJT and FET amplifier circuits.
CO3	Design and analyze the sinusoidal oscillators and power amplifiers.
CO4	Understand, analyze and design the functioning of linear ICs and their applications.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
													2		
CO1	3												2		
CO2		2	2										2		
CO3		2	2										2		
CO4	2	2	2												

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Control Systems		SUBJECT CODE	18EC43
FACULTY NAME	Dr. Shilpa K Gowda / Mrs. Latha S			

	CO STATEMENTS
CO1	Understand and develop the mathematical model of mechanical, electrical systems
CO2	Determine transfer function for a given control system using block diagram reduction techniques and signal flow graph method.
CO3	Determine the time domain specifications for first and second order systems.
CO4	Analyze the stability of a system using Routh-Hurwitz Criterion, Root-locus technique, Nyquist and bode plots.
CO5	Develop a control system model in continuous and discrete time using state variable techniques

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	3	2	-	1	-	-	-	-	-	-	-	3	2	-
CO5	3	3	2	-	1	-	-	-	-	-	-	-	3	2	-

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SUBJECT NAME	Engineering Statistics & Linear Algebra		SUBJECT CODE	18EC44
FACULTY NAME	Dr. Anitha P / Mr. Bhaskar B			
	CO STATEMENTS			
CO1	Understand Single and Multiple Random Variables, and their extension to Random Processes.			
CO2	Compute the quantitative parameters for the functions of single and Multiple Random Variables and Processes.			
CO3	Familiarize with the concept of Vector spaces and orthogonality with qualitative insight into applications.			
CO4	Compute the quantitative parameters for Matrices and Linear Transformations.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	1	2	2	-	1
CO2	3	2	2	-	-	-	-	-	-	-	1	2	2	-	1
CO3	3	2	1	-	2	-	-	-	-	-	2	2	2	-	1
CO4	3	1	2	-	2	-	-	-	-	-	2	2	2	-	1

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SUBJECT NAME	Signals & Systems	SUBJECT CODE	18EC45
FACULTY NAME	Mrs. Latha S / Mr. Rahul Rai		

	CO STATEMENTS
CO1	Understand & analyze the different types of signals and systems.
CO2	Determine the various properties of continuous and discrete time systems.
CO3	Comprehend the knowledge of LTI systems and compute the response of a Continuous and Discrete LTI system using convolution.
CO4	Determine the spectral characteristics of continuous and discrete time signal using Fourier analysis.
CO5	Apply the knowledge of Z-transforms to analyse discrete systems in frequency domain.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
													2		
CO1	2	2	2										2		
CO2	2	2	2										2		
CO3	2	2	2										2		
CO4	2	2	2										2		
CO5	2	2	2												

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SUBJECT NAME	Microcontroller		SUBJECT CODE	18EC46
FACULTY NAME	Dr. Ravikumar A V/ Mrs. Uma S			
	CO STATEMENTS			
CO1	Explain the difference between MP and MC, architecture of 8051 MC and external Memory interfacing and Instruction set of 8051.			
CO2	Analyze 8051 assembly level and C program to send and receive serial data and generate timings waveforms			
CO3	Explain the interrupt systems, operation of timers/Counters and serial port of 8051			
CO4	Interface simple switches, simple LEDs, ADC0804,LCD and stepper motor to 8051 using IO ports.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2											2		
CO2	2	2											2		
CO3	2	2											2		
CO4	2	2											2		

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SUBJECT NAME	Microcontroller Lab	SUBJECT CODE	18ECL47
FACULTY NAME	Mr. Rahul Rai, Mrs. Anushree. Dr. Ravikumar A V, Mrs. Sowmya B J (B1), Mrs. Anushree (B1, B2), Mrs.Uma (B2) Mrs. Uma S, Mrs. Sowmya B J, Mr. Rahul Rai(C1), Mrs. Nithya S (C2)		

	CO STATEMENTS
CO1	Demonstrate ability to handle data transfer, arithmetic operations, counters and Boolean and logical instructions using assembly language programming
CO2	Understand and design of experiments demonstrating the usage of call and return instructions, code conversion, delay programs and serial port programs
CO3	Interface different input and output devices to 8051 and control them using Assembly language programs
CO4	Interface the serial devices to 8051 and do the serial transfer using C programming.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2			2								2		
CO2	2	2			2								2		
CO3	2	2	2		2				1				2		
CO4	2	2	2		2				1				2		

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SUBJECT NAME	Analog Circuits Lab		SUBJECT CODE	18ECL48
FACULTY NAME	Dr. Shilpa K Gowda, Mrs. Chetana R, Ms. Geethanjali (A1 & A2) Mr. Bhaskar, Mr. Darshan, Ms. Geethanjali (B1), Mrs. Chetana R(B2) Dr. Anitha P Dr. K R Rekha (C1), Dr. T Vijaykumar (C2)Mr. Bhaskar (C1), Mr. Darshan(C2)			
CO STATEMENTS				
CO1	Design analog circuit using BJT/FET and evaluate their performance characteristics			
CO2	Design analog circuit using opamp for different applications			
CO3	Simulate and analyze analog circuits that uses ICs for different electronics applications			

CO- PO-PSO MAPPING:18ECL48

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	3									2		
CO2	2	2	3	3									2		
CO3	2	3	1	2	3								2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Technological Innovation Management and Entrepreneurship	SUBJECT CODE	18ES51
FACULTY NAME	Mrs. Pushpalatha G / Ms. Geethanjali		

CO STATEMENTS	
CO1	Understand the fundamentals concepts of management and entrepreneurship and opportunities in order to set up the business
CO2	Describe the functions of managers entrepreneur and their social responsibilities
CO3	understand the components in developing business plan
CO4	Awareness about various sources of funding and institution supporting entrepreneur and social responsibility of entrepreneurs
CO5	Understand the business plan and its model project design and project report preparation

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2													2
CO2	2	2													2
CO3	2	2					2								2
CO4	2	2							2						2
CO5	2	2					2								2

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SUBJECT NAME	Digital Signal Processing		SUBJECT CODE	18EC52
FACULTY NAME	Mr. Rahul R Rai / Mrs. Sowmya B J			
	CO STATEMENTS			
CO1	Compute DFT of real and complex discrete time signals and determine response of LTI systems using time domain and DFT techniques.			
CO2	Computation of DFT using FFT algorithms and linear filtering approach.			
CO3	Design and realize FIR and IIR digital filters			
CO4	Understand the DSP processor architecture.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1											2		
CO2	2	1											2		
CO3	2	1	1										2		
CO4	2	1	1										2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Principles of Communication Systems		SUBJECT CODE	18EC53
FACULTY NAME	Mrs. Supriya M /Dr. Shilpa K Gowda /Mr. Bhaskar B			
	CO STATEMENTS			
CO1	Determine the performance of analog modulation schemes in time and frequency domains			
CO2	Determine the performance of systems for generation and detection of modulated analog signals.			
CO3	Characterize analog signals in time domain as random processes and in frequency domain using Fourier transforms.			
CO4	Characterize the influence of channel on analog modulated signals			
CO5	Understand the characteristics of pulse amplitude modulation, pulse position modulation and pulse code modulation systems.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2													
CO2	2	2													
CO3	3	1													
CO4	2	2													
CO5	3	3													

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SUBJECT NAME	Information Theory & Coding		SUBJECT CODE	18EC54
FACULTY NAME	Dr. Shilpa K G /Dr. K Somashekar /Mrs. Divyashree			
CO STATEMENTS				
CO1	Ability to apply the mathematical knowledge of probability to measure information in discrete message sources (Dependent and independent source)			
CO2	Apply source encoding algorithms such as Shannon coding, Huffman coding, Arithmetic coding to ensure transmission of information of a discrete message source using minimum number of bits.			
CO3	Ability to compute and analyze the capacity and efficiency of discrete and continuous time channels.			
CO4	Design encoding and decoding techniques for Linear block code, Cyclic code& Convolution code to ensure error free transmission of information of a discrete message source.			

CO- PO-PSO MAPPING:
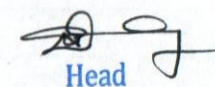
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2											2		
CO2	2	2											3		
CO3	2	2											2		
CO4	2	2	2										2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Electromagnetic Waves		SUBJECT CODE	18EC55
FACULTY NAME	Dr. Mahantesh K /Mrs. Anushree R			

	CO STATEMENTS
CO1	Evaluate problems on electric force, electric field due to point, linear, volume charge by applying conventional methods and charge in volume.
CO2	Apply Guass law to evaluate electric fields due to different charge distributions and volume charge distribution by divergence theorem.
CO3	Determine potential and energy with respect to point charge and capacitance using laplace equation and apply Biot savarts law and Ampere law for evaluating magentic field.
CO4	Calculate magentic force potential energy and magnetization with respect to magnetic materials and voltage induction in electric currents.
CO5	Apply maxwell's equations for time varying fields, Electromagnetic waves in free space and conductor's and evaluate power associated with poynting theorem.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2													
CO2	1	2													
CO3	2	2													
CO4	2	2													
CO5	1														

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SUBJECT NAME	Verilog HDL		SUBJECT CODE	18EC56
FACULTY NAME	Mrs.Divyashree Y V			
CO STATEMENTS				
CO1	Define the usage of Verilog hardware language in semiconductor technology and design flow of digital circuits.			
CO2	Develop Verilog programs in gate, dataflow (RTL), behavioral and switch modelling level of abstraction.			
CO3	Design and verify the functionality of digital circuit/ system using test benches			
CO4	Analyze the program more effectively using Verilog tasks, functions and directives.			
CO5	Interpret the various constructs in logic synthesis and perform timing and delay simulation			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2										2		
CO2	2	2	2										2		
CO3	2	2	2		2								2		
CO4	2	2	2		2								2		
CO5	2	2	2		2								2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Digital Signal Processing Laboratory		SUBJECT CODE	18ECL57
FACULTY NAME	Mr. Rahul Rai, Mrs. Sowmya B J, Mrs. Uma S Mrs. Sowmya B J & Dr. Mahantesh K Mrs. Uma S, Dr. Mahantesh K, Mr.Rahul Rai			
	CO STATEMENTS			
CO1	Apply the concepts of signal processing in time and frequency domain using simulation tool and DSP processor			
CO2	Analyse and verify the properties of discrete time signals & systems			
CO3	Design digital filters using a simulation tool and a DSP processor and verify the frequency and phase response for the given specifications			
CO4	Ability to work as an individual to design, implement and demonstrate signal/image processing methods using matlab tool			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3	2	
CO2		2											3	2	
CO3			3										3	2	
CO4				1	1				1	1	1	1	3	2	

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SUBJECT NAME	HDL Laboratory		SUBJECT CODE	18ECL58
FACULTY NAME	Mrs. Divyashree, Latha S, Dr. Supreeth Mrs. Latha S & Mr. Darshan B D Dr. Supreeth H S G, Mrs. Divyashree, Mr.Darshan			
	CO STATEMENTS			
CO1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.			
CO2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.			
CO3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.			
CO4	Interface the hardware to the programmable chips and obtain the required output			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2										2		
CO2	2	2	2										2		
CO3	2	2	2										2		
CO4	2	2	2										2		

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SUBJECT NAME	Digital communication		SUBJECT CODE	18EC61
FACULTY NAME	Mrs. Jyothi H /Mrs. Supriya M			
	CO STATEMENTS			
CO1	Associate and apply the concepts of bandpass sampling to well specified signals and channels			
CO2	Analyse symbol processing at the transmitter and the performance parameters at the receiver under ideal and corrupted bandlimited channels. r.			
CO3	Demonstrate bandpass signals subjected to corrupt and distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specific			
CO4	Analyse and compute spread spectrum techniques.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2										2	2	
CO2	2	3	2										2	2	
CO3	2	2	2										3	2	
CO4	3	2	3										2	3	

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SUBJECT NAME	Embedded Systems		SUBJECT CODE	18EC62
FACULTY NAME	Dr. K Somashekar / Dr. D N Chandrappa			
	CO STATEMENTS			
CO1	Describe the architectural features and instruction set of 32-bit microcontroller ARM Cortex M3			
CO2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications. ·			
CO3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.			
CO4	Develop the hardware software co-design and firmware design approaches.			
CO5	Explain the need of real time operating system for embedded system applications.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1											2		
CO2	2	2	1										1	1	
CO3	2												1		
CO4	2		1										1		
CO5	2	1											1		

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SUBJECT NAME	Microwave & Antennas	SUBJECT CODE	18EC63
FACULTY NAME	Dr. Anitha P /Dr. Komala M		

	CO STATEMENTS
CO1	Understand and analyze the various parameters related to microwave transmission lines and waveguides
CO2	Analyze the behavior of microwave devices using scattering parameters and Identify microwave devices for different applications.
CO3	Apply the knowledge of electromagnetic theory to understand the basics of antenna theory.
CO4	Analyze various antenna configurations according to the application.

CO- PO-PSO MAPPING:18EC63

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2													
CO2	2	3	1										2		
CO3	3	2													
CO4	2	3	1										2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Python App. Programming		SUBJECT CODE	18EC646
FACULTY NAME	PG /Dr. MK			

	CO STATEMENTS
CO1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2	Demonstrate proficiency in handling Strings and File Systems.
CO3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
CO6	

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1													
CO2	1	2			1								1		
CO3	2	2	1										1		
CO4	2	1			2						2		1		
CO5	2	2			3						1		2		

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SUBJECT NAME	Operating System	SUBJECT CODE	18EC641
FACULTY NAME	Mrs. Nithya S		
	CO STATEMENTS		
CO1	Explain the goals, structure, operation and types of operating systems.		
CO2	Apply scheduling techniques to find performance factors		
CO3	Understand the organization of file systems and IOCS		
CO4	Apply suitable techniques for contiguous and non-contiguous memory allocation.		
CO5	Describe message passing, deadlock detection and prevention methods.		

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											2		
CO2	2	3	2										2		
CO3	2	3											2		
CO4	3	2											2		
CO5	2	2	2										2		

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SUBJECT NAME	Digital System Design using Verilog		SUBJECT CODE	18EC644
FACULTY NAME	Mrs. Divyashree Y V			

	CO STATEMENTS
CO1	Understand the embedded systems, using small microcontrollers, larger CPUs/DSPs, or hard or soft processor cores.
CO2	Design & Construct the combinational circuits using discrete gates and programmable logic devices.
CO3	Develop the Verilog model for sequential circuits and test pattern generation
CO4	Explore the different types of semiconductor memories and their usage for specific chip design
CO5	Analyze and synthesis of processor and I/O controllers that are used in embedded system design

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2										3		
CO2	2	3	3										3		
CO3	2	3	3										3	1	
CO4	2	2	3										3		
CO5	2	2	2										2		

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SUBJECT NAME	Embedded Systems Laboratory		SUBJECT CODE	18ECL66
FACULTY NAME	Mrs. Anushree R & Dr. K Somashekar Dr. Komala M & Mrs. Latha S			
	CO STATEMENTS			
CO1	Understand the Instruction set of 32-bit microcontroller. ARM Cortex M3 and the software tool required for Programming in Assembly & C Language			
CO2	Develop Assembly Language Programs using ARM Cortex-M3 for Different Applications			
CO3	Develop C Language Programs to Interface external device and input output with ARM Cortex M3			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2			3								3		
CO2	3		2	2	3				2	2			3	2	
CO3	3		2	2	3				2	2	2	2	3	2	

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SUBJECT NAME	Communication Laboratory	SUBJECT CODE	18ECL67
FACULTY NAME	Mrs. Jyothi H & Mrs. Chetana R Mrs. Supriya M & Mrs. Sowmya B J		

	CO STATEMENTS
CO1	Design and test the Analog, Digital modulation, and demodulation circuits.
CO2	Determine the characteristics and response of microwave waveguide.
CO3	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.
CO4	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1					2	2		1	2		
CO2	2	2	2						2	2		1	2		
CO3	2	2	2						2			1	2	1	
CO4	2	2	2	1	3				2			1	2		

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SUBJECT NAME	Mini – Project		SUBJECT CODE	18ECMP68
FACULTY NAME	Mrs. Latha S & Mrs. Nithya S			
	CO STATEMENTS			
CO1	Understand how to identify the challenges & issues in industry, society, and environment.			
CO2	Perform analysis and design methodologies with novelty to devise solution for the problem statement.			
CO3	Work in a team to achieve a common goal			
CO4	Communicate effectively and to present ideas clearly and coherently in both written and oral forms.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		2		1		1	2				2	1	
CO2	3	3	3	2	1				2		1		2	1	
CO3	2	2							3				2		
CO4								2	2	2		1	2		

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SUBJECT NAME	Computer Networks		
FACULTY NAME	Mrs. Pushpalatha G / Dr. Kumutha D	SUBJECT CODE	18EC71

	CO STATEMENTS
CO1	Understand the concept of networking and its architectures.
CO2	Describe the various protocols and services of different layers.
CO3	Distinguish the basic network configuration and standards associated with each network.
CO4	Analyze a simple network and measure its parameters

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-	2	-	-

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SUBJECT NAME	VLSI Design		SUBJECT CODE	18EC72
FACULTY NAME	Dr. K V Mahendra Prashanth / Mrs. Chetana R			
	CO STATEMENTS			
CO1	Demonstrate the concepts of MOS transistor theory			
CO2	Elucidate the concepts of CMOS fabrication process, layout design rules, scaling			
CO3	Understanding the delay model and combinational circuit design			
CO4	Design of sequential circuits and dynamic logic circuits			
CO5	Interpret semiconductor memories testing, verification principles in VLSI Design			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2											2			
CO2	2											2			
CO3	2											2			
CO4	2	2										3			
CO5	2											2	1		

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SUBJECT NAME	Real Time Systems		
FACULTY NAME	Mrs. Nithya S	SUBJECT CODE	18EC731

	CO STATEMENTS
CO1	Understand the fundamentals of Real time systems and its classifications.
CO2	Understand the concepts of computer control, operating system and the suitable Computer hardware requirements for real-time applications.
CO3	Develop the software languages to meet Real time applications.
CO4	Apply suitable methodologies to design and develop Real-Time Systems.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2													
CO2	3	2											2		
CO3	2	3	2										2		
CO4	2	3											2		
													2		

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SUBJECT NAME	Satellite Communication		SUBJECT CODE	18EC732
FACULTY NAME	Dr. Anitha P			
	CO STATEMENTS			
CO1	Describe the Satellite orbits and its trajectories with the definition of parameters associated with it.			
CO2	Describe the electronic hardware systems associated with a satellite subsystem and earth station.			
CO3	Compute the satellite link parameters under the various propagation conditions with the illustration of multiple access techniques.			
CO4	Describe the communication satellites with the focus on national satellite system.			
CO5	Describe the satellites used for applications in remote sensing, weather forecasting and navigation.			

CO- PO-PSO MAPPING:18EC732

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											2		
CO2	2	2											1		
CO3	3	2											2		
CO4	3	2										1	2		
CO5	3	2										1	2		

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Digital Image Processing		
FACULTY NAME	Dr. D N Chandrappa	SUBJECT CODE	18EC733

	CO STATEMENTS
CO1	Describe the fundamental of digital image processing.
CO2	Understand image formation and image analysis techniques.
CO3	Apply image processing techniques in both the spatial and frequency (Fourier) domains.
CO4	Conduct independent study and analysis of Image Enhancement and restoration techniques.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	2	-	-	1	-	-	-	-	-	-	-	2	1	-
CO3	3	2	-	1	2	-	-	-	-	-	-	-	2	1	-
CO4	3	2	1	1	1	-	-	-	-	-	-	-	2	-	-

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	IOT & WSN		SUBJECT CODE	18EC741
FACULTY NAME	Mr. Darshan B D /Dr. Lakshminarayana			
	CO STATEMENTS			
CO1	Describe the OSI Model for the IoT/M2M Systems.			
CO2	Understand the architecture and design principles for IoT.			
CO3	Learn the programming for IoT Applications.			
CO4	Identify the communication protocols which best suit the WSNs.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2											2	1	
CO2	2	2											2	1	
CO3	2	2											2	1	
CO4	2	2											2	1	

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Cryptography		SUBJECT CODE	18EC744
FACULTY NAME	Mrs. Uma S			

	CO STATEMENTS
CO1	Explain basic cryptographic algorithms to encrypt and decrypt the data.
CO2	Use symmetric and asymmetric cryptography algorithms to encrypt and decrypt the information.
CO3	Apply concepts of modern algebra in cryptography algorithms.
CO4	Apply pseudo random sequence in stream cipher algorithms.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2				1	2	2					2		
CO2	3	2				1	2	2					2		
CO3	3	3	1			2	2	2			1	1	2	1	
CO4	3	3	1			2	2	2			1	1	2	1	

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Computer Networks Lab	SUBJECT CODE	18ECL76
FACULTY NAME	Dr. Kumutha D & Ms. Geethanajali N Mrs. Pushpalatha G & Mrs. Chetana R		

	CO STATEMENTS
CO1	Identify suitable tools to model a network and understand the protocols at various OSI reference levels.
CO2	Design a suitable network and simulate using a Network simulator tool.
CO3	Simulate the networking concepts and protocols using C/C++ programming.
CO4	Model the networks for different configurations and analyze the results.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2		1	1								2		
CO2	2	2	2										2	2	
CO3	2	2	2	1	1								2		
CO4	2	2	2										2		

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SUBJECT NAME	VLSI Laboratory		
FACULTY NAME	Mrs. Jyothi H, Mrs. Uma S, Mrs. Nithya & Mrs. Supriya M	SUBJECT CODE	18ECL77

	CO STATEMENTS
CO1	Design and simulate combinational and sequential digital circuits using Verilog HDL
CO2	Understand the synthesis process of digital circuits using EDA tool.
CO3	Perform ASIC Design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtains optimum gate level net list.
CO4	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers
CO5	Perform RTL-GDSII flow and understand the stages in the ASIC design flow

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	3								3	2	1
CO2	3	3	3	1	3								3	2	1
CO3	3	3	3	1	3								3	2	1
CO4	3	3	3	1	3								3	2	1
CO5	3	3	3	1	3								3	2	1

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SUBJECT NAME	Wireless & Cellular Communication		SUBJECT CODE	18EC81
FACULTY NAME	Dr. Komala M /Mrs. Anushree R			
	CO STATEMENTS			
CO1	Interpret the concept of propagation mechanism in wireless channels			
CO2	Compare the network architecture of GSM, TDMA and CDMA Technology in cellular network.			
CO3	Understand the system architecture and the functional standards in LTE 4G.			
CO4	Analyze the hierarchical Channel Structure of LTE using OFDMA and SC-FDMA principles .			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	-	-	-	-	-	-	-	-	-	2	-	-
CO2	2	-	-	-	-	2	-	-	-	-	1	1	2	-	-
CO3	3	2	-	-	-	-	2	-	-	-	-	-	2	2	-
CO4	2	2	-	-	-	-	-	-	-	-	-	1	2	-	-

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Network Security		SUBJECT CODE	18EC821
FACULTY NAME	Dr. Vijayakumar T /Mrs. Chetana R			
	CO STATEMENTS			
CO1	Understand the network security services and mechanisms with security concepts			
CO2	Explain the concept of Transport Level Security and Secure Socket Layer			
CO3	Explain the Security concerns in Internet Protocol security			
CO4	Explain and Analyse the concepts of Intruders, Intrusion detection and Malicious Software			
CO5	Describe Firewalls, Firewall Characteristics, Biasing and Configuration			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											2		3
CO2	2	2											2		1
CO3	3	2	1										2		1
CO4	2	2			1	2					1		2		3
CO5	3	3											2		2

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Project work phase – 2		SUBJECT CODE	18ECP83
FACULTY NAME	Dr. Mahantesh K & Mr. Bhaskar B			

	CO STATEMENTS
CO1	Identify the domain of interest and problem with multidisciplinary approach by applying acquired knowledge.
CO2	Perform requirement analysis and identify design methodologies with novelty & societal relevance in it.
CO3	Apply advanced engineering tools and perform hardware/software design from a product perspective.
CO4	Combine all the modules through effective team work after efficient testing.
CO5	Task completion and compilation of the project report.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	3	-	-	-	3	-	-	-	-	3	-	-
CO2	-	3	3	3	-	2	-	2	2	-	3	-	3	-	-
CO3	3	3	-	-	3	-	3	-	3	-	-	-	-	-	3
CO4	3	3	-	-	3	3	-	-	3	-	-	-	-	3	-
CO5	3	3	-	-	-	-	-	-	3	3	3	3	-	-	3

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COURSE OUTCOMES AND CO-PO-PSO ARTICULATION MATRIX BATCH 2018-22

SUBJECT NAME	Technical Seminar		SUBJECT CODE	18ECS84
FACULTY NAME	Dr. Rekha K R & Mrs. Chetana R			
	CO STATEMENTS			
CO1	Acquire, establish and emphasize the information from literature and beyond of upcoming technologies.			
CO2	Based on the engineering knowledge, analyze the comprehensive solution related to societal, health and safety.			
CO3	To impart skills in report writing describing the paper and results.			
CO4	Ability to work independently and demonstrate for effective collection, analyze and organize scientific information.			

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		2				1					2		
CO2		3	2	2		1		2					2		2
CO3	2	3			2		2		2		2				
CO4	2	3			2	3			2					2	

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SUBJECT NAME	Internship		SUBJECT CODE	18EC185
FACULTY NAME	Dr. Ravikumar A V & Dr. Manjunath M			

	CO STATEMENTS
CO1	Ability to develop employee-valued skills such as teamwork, communication, ethical values, multidisciplinary critical thinking and adaptability.
CO2	Manifest the student to the environment and expectations of performance on the part of technical and professional to practice in private and public sectors.
CO3	Develop work habits and attitudes necessary for successful employability.
CO4	Adopting theory and practices learnt by the students to enhance their abilities in the field of study.

CO- PO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	2		2	1		3	3	2				2	2
CO2	2	2	2	2			2				3		2	2	
CO3								2	2	2	1	3		1	2
CO4	3	2		2		2	1		1				3	2	

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