

Poornima College of Engineering, Jaipur
Department of Electrical Engineering
CO-PO & CO-PSO Mapping (2023-24)

Course Code	Course Name	CO No	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
1	1FY2-01	Engineering Mathematics-I	CO 1	Classify the nature (bounded, convergent and divergent) of	3	1	-	-	-	-	-	-	-	-	-	1	-	-		
			CO 2	Describe the derivatives of function and apply concept in	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 3	Explain Fourier series of a given periodic function in time	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 4	Compute area, volume, work done, centre of mass and gravity	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 5	Find the solution of complex integration (double and triple	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
2	1FY2-02	Engineering Physics	CO 1	Describe the concepts of Wave and Quantum mechanics, Laser	3	2	-	-	-	-	-	-	-	-	-	2	1	-		
			CO 2	Explain the different applications of Laser and optical fibers in	3	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
			CO 3	Find energy states in 1-D and 3-D box with the application of	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 4	Examine the crystal structure through X-ray Diffraction,	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 5	Evaluate the wavelength of light with the help of Newton's	3	3	-	-	-	-	-	-	-	-	-	-	-	2	1	-
3	1FY1-05	Human Values	CO 1	Relate sustained happiness through identifying the essentials of	-	-	-	-	-	3	2	3	-	2	-	-	-	-	1	
			CO 2	Find the happiness and human values in terms of personal and	-	-	-	-	-	3	2	2	-	2	-	3	-	-	-	2
			CO 3	Use and understand practically the importance of trust,	-	-	-	-	-	3	1	2	-	2	-	3	-	-	-	1
			CO 4	Identify the orders of nature for the holistic perception of	-	-	-	-	-	3	3	3	-	2	-	3	-	-	-	2
			CO 5	Implement professional ethics and natural acceptance of human	-	-	-	-	-	3	-	3	3	3	3	3	-	3	-	-
4	1FY3-06	Programming for Problem Solving	CO 1	Describe an algorithm using flowchart/pseudo code for a given	2	1	-	-	-	-	-	-	-	-	-	1	-	-		
			CO 2	Write a c program to Compare various Conditional, Iterative	2	2	-	-	-	-	-	-	-	-	-	-	-	1	1	-
			CO 3	Examine the concept of Operators, Pointer, Array, String, file to	2	2	-	-	-	-	-	-	-	-	-	-	-	1	1	-
			CO 4	Write a programme for implementation of structure, union	2	2	-	-	-	-	-	-	-	-	-	-	-	1	1	-
			CO 5	Assess the User Defined functions, Memory management and	2	2	-	-	-	-	-	-	-	-	-	-	-	1	1	-
5	1FY3-09	Basic Civil Engineering	CO 1	Describe basics of surveying, types of building, mode of	3	-	-	-	-	-	-	-	-	-	-	1	-	-		
			CO 2	Compute bearings and elevations of respective points on the	3	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
			CO 3	Classify method of levelling, road safety measures, building	3	-	-	-	-	2	-	-	-	-	-	-	-	2	-	-
			CO 4	Illustrate different types of foundation, treatment and disposal	3	-	-	-	-	2	-	-	-	-	-	-	-	2	-	-
			CO 5	Explain solid waste management, building by law, chemical	3	-	-	-	-	2	-	-	-	-	-	-	-	2	-	-
6	1FY2-20	Engineering Physics Lab	CO 1	Operate the various devices for the multifarious use in the	3	2	-	-	-	-	-	3	3	3	1	3	2	1	1	
			CO 2	Determine wavelength of different spectral lines.	3	3	-	1	2	-	-	3	3	3	2	3	2	2	2	2
			CO 3	Identify type of semiconductor by using hall effect in addition	3	3	-	2	3	-	-	3	3	3	1	3	2	3	1	1
			CO 4	Measure height of an object by using sextant.	3	3	-	3	3	-	-	3	3	3	2	3	2	3	2	2
			CO 5	Explain the concepts of optical fiber and laser	3	-	-	-	3	-	-	3	3	3	2	3	2	3	2	2
7	1FY1-23	Human Values Activities and Sports	CO 1	Discuss and recall the natural and social issues and their	-	-	-	-	-	3	3	3	2	3	-	1	-	-	1	
			CO 2	Describe the nature of human values and the impact of external	-	-	-	-	-	3	1	2	3	3	-	2	-	-	-	1
			CO 3	Relate and explain the significance of trust, respect and	-	-	-	-	-	2	2	3	3	3	-	3	-	-	-	2
			CO 4	Outline the relation of human with nature and other factors in	-	-	-	-	-	3	3	1	2	3	-	3	-	-	-	2
			CO 5	Examine and comparison of self with clear understanding of	-	-	-	-	-	3	3	2	3	3	-	3	-	-	-	2
8	1FY3-24	Computer Programming Lab	CO 1	Relate the fundamental of C Programming as variable,	2	1	-	-	2	-	-	1	2	3	-	1	1	1	1	
			CO 2	Write programs that perform operations using condition control	3	2	-	-	2	-	-	2	2	3	-	3	2	2	2	1
			CO 3	Use C programs to implement operations related to Macros and	3	2	-	-	2	-	-	3	2	3	1	3	2	2	2	1
			CO 4	Examine concept of Structure, Unions and Pointers to write C	3	2	-	-	2	-	-	3	2	3	1	3	2	2	2	1
			CO 5	Investigate the implementation of operations related to File	3	2	-	-	2	-	-	3	2	3	1	3	2	2	2	1
9	1FY3-27	Basic Civil Engineering Lab	CO 1	Calculate the linear and angular measurements of the points on	-	3	-	-	-	-	2	3	2	-	-	-	1	-	-	
			CO 2	Illustrate various sanitary fittings and water supply fittings	-	-	-	-	-	2	3	2		2	-	1	-	-	-	1
			CO 3	Explain concepts of EDM and Total Station in the field	-	-	-	-	-	2		2		2	-	-	-	1	-	-
			CO 4	Evaluate pH, Turbidity and Hardness of given tap water sample	-	3	-	-	-	2	3	2	3	2	-	2	2	2	1	1
			CO 5	Evaluate pH and Total solids of given sewage sample	-	3	-	-	-	2	3	2	3	2	-	2	2	2	1	1
10	1FY3-28	Computer Aided Engineering Graphics	CO 1	Describe engineering drawing terminology	3	-	-	-	-	1	-	2	2	2	-	3	1	-	1	
			CO 2	Apply Concept of scales and conic sections.	3	1	1	-	-	-	-	2	2	2	-	2	1	1	1	1
			CO 3	Draw Projection of Points, lines, planes and solids.	3	3	2	-	-	-	-	2	2	2	-	2	2	2	1	2
			CO 4	Analyze the concepts of section of solids	3	2	3	-	-	-	-	2	2	2	-	2	2	2	1	2
			CO 5	Draft 2D engineering problems on CAD software.	3	3	3	-	3	2	-	2	2	3	-	3	3	3	3	2
			CO 1	Describe rank of matrix for the study of systems of linear	3	3	-	-	-	-	-	-	-	-	2	1	-			

1	2FY2-01	Engineering Mathematics-II	CO 2	Relate certain basic types of first order ODEs for which exact	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 3	Apply analytical technique of differential equation for finding	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 4	Solve Linear and non-linear Partial Differential Equations	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 5	Classify higher order partial differential equation to describe a	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
2	2FY2-03	Engineering Chemistry	CO 1	Describe characteristics of water, fuel and Engineering	3	1	-	-	-	-	-	-	-	-	-	-	1	-	-
			CO 2	Understand societal problems related to water purification,	3	2	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 3	Determine of hardness of water and calorific value of fuels for	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 4	Compare different techniques of water treatment, fuel analysis,	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 5	Prepare the generic drugs or medicines by understanding the	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
3	2FY1-04	Communication Skills	CO 1	Describe the process of communication, basics of Grammar and	-	-	-	-	2	1	-	2	-	3	-	1	-	1	1
			CO 2	Explain the types of communication, barriers and channels of	-	-	-	-	2	-	-	2	-	3	-	2	-	1	1
			CO 3	Write and prepare professional reports, paragraph and business	-	-	-	-	2	-	2	3	-	3	-	2	-	1	1
			CO 4	Discuss and illustrate the impact of social and moral values by	-	-	-	-	-	-	3	3	-	3	-	3	-	-	2
			CO 5	Restate and outline the basic areas of English Language Skills	-	-	-	-	-	-	3	3	-	3	-	3	-	-	2
4	2FY3-07	Basic Mechanical Engineering	CO 1	Describe concepts of thermal, functional design of machine	3	-	-	-	-	1	-	-	-	-	-	-	1	-	-
			CO 2	Classify different types of turbines and power plants, pumps	3	2	-	-	-	2	-	-	-	-	-	-	2	1	-
			CO 3	Apply the fundamental knowledge of thermal engineering, in	3	3	1	-	-	3	-	-	-	-	-	-	3	1	-
			CO 4	Examine about the turbine & pumps, IC engines, refrigeration	3	3	-	-	-	2	-	-	-	-	-	-	3	1	-
			CO 5	Evaluate problems related to refrigeration, turbine, pump,	3	3	-	-	-	2	-	-	-	-	-	-	3	1	-
5	2FY3-08	Basic Electrical Engineering	CO 1	Solve various ac and dc circuit related problems	3	3	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 2	Understand electromechanical energy conversion process	3	2	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 3	Analyze characteristics of various power electronic devices.	3	3	1	-	-	-	-	-	-	-	-	-	2	1	-
			CO 4	Explore knowledge of protective devices and energy	3	2	-	-	-	-	-	-	-	-	-	-	2	1	-
6	2FY2-21	Engineering Chemistry Lab	CO 1	Determine the strength of unknown solution by volumetric	3	2	-	-	-	-	2	3	-	2	2	2	2	1	1
			CO 2	Apply the knowledge for the determination of few	3	3	-	1	-	-	2	3	3	2	2	2	2	2	1
			CO 3	Analyze Coal quality by Proximate analysis of Coal sample.	3	3	-	1	-	-	-	3	3	2	2	2	2	2	1
			CO 4	Explore their knowledge of synthesis of drugs.	3	3	-	-	-	-	-	3	2	2	2	2	2	1	1
7	2FY1-22	Language Lab	CO 1	Use and pronounce the words correctly.	-	-	-	-	1	3	-	2	2	3	-	3	1	1	1
			CO 2	Discuss and explain effectively with elaboration.	-	-	-	-	1	3	-	2	2	3	-	3	1	1	1
			CO 3	Plan successfully and crack GD's, interviews and other	-	-	-	-	1	3	2	3	2	3	-	3	-	1	2
			CO 4	Describe his/her thoughts and views in an effective manner.	-	-	-	-	-	3	3	3	2	3	-	3	1	-	2
			CO 5	Relate and comprehend for the correct expression.	-	-	-	-	-	3	3	3	2	3	1	3	1	-	2
8	2FY3-25	Manufacturing Practices Workshop	CO 1	Describe the working of Lathe machine.	-	-	2	3	-	-	-	-	1	1	-	2	-	-	1
			CO 2	Identify tools and develop various carpentry joints.	-	-	3	-	-	-	-	2	2	2	-	2	-	-	2
			CO 3	Apply the basic concepts of Foundry Shop.	-	-	3	-	-	2	-	2	2	2	-	2	1	-	2
			CO 4	Develop the object by using sheet metal Shop.	-	-	3	-	-	2	-	2	2	2	-	2	1	-	2
			CO 5	Evaluate different type of joints in welding shop.	-	-	2	3	-	-	-	2	2	2	-	2	-	1	2
9	2FY3-26	Basic Electrical Engineering Lab	CO 1	Discuss measurement of electrical quantities	3	-	-	-	-	-	-	3	3	-	2	2	1	-	1
			CO 2	Compare different connections of transformer	3	-	-	-	-	-	-	3	3	-	2	2	1	-	1
			CO 3	Explain constructional features of electrical machines and	3	-	-	-	-	-	-	3	3	-	2	1	1	-	1
			CO 4	Explain characteristics of DC motor	3	1	-	-	-	-	-	3	3	-	2	1	1	1	1
10	2FY3-29	Computer Aided Machine Drawing	CO 1	Describe Projections and basic Geometrical Concept	3	-	-	-	-	1	-	2	2	2	-	3	1	-	1
			CO 2	Draw orthographic projection of engineering objects	3	1	1	-	-	-	-	2	2	2	-	2	1	1	1
			CO 3	Analyze Sectional Views of different mechanical Components	3	3	2	-	-	-	-	2	2	2	-	2	2	1	2
			CO 4	Evaluate assembly drawing	3	2	3	-	-	-	-	2	2	2	-	2	2	1	2
			CO 5	Draft a engineering product using CAD software	3	3	3	-	3	2	-	2	2	3	-	3	3	3	2
1	3EE1-02	Technical Communication	CO 1	Remember the fundamental principles of technical writing and genre in written communication within technical domains.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
			CO 2	Understand the intricacies of planning, drafting, revising, editing, and critiquing professional documents within the realm of technical communication when engaging in both individual and collaborative writing.	-	-	-	-	-	-	-	-	-	3	-	-	1	-	-
			CO 3	Apply skills in note-making, grammar editing, technical style, project report creation, and LSWR (Listening, Speaking, Writing, Reading) in the context of technical communication.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	2

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6	3EE4-07	Electrical Machine I	CO 2	Analyze the control practices and characteristics of DC Machines and Transformers.	-	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Investigate the performance, different types of connections, equivalent circuits and testing of DC machines and Transformers under different loading conditions. [Create]	3	-	-	3	-	-	-	-	-	-	-	-	-	-
			CO 4	Evaluate scope of applicability of DC machines and Transformers in real-life multidisciplinary usages.	-	2	-	2	-	-	-	-	-	-	-	-	-	-
7	3EE4-08	Electromagnetic Field	CO 1	Demonstrate the laws and theorems of electric field, magnetic field and time-varying fields. [Apply]	3	2	-	-	-	-	-	-	-	-	-	2	-	-
			CO 2	Debate the Charge distribution, boundary conditions, Laplace, Poisson and Maxwell's equations in search of a solution. [Analyze]	3	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Analyze the behaviour of dielectric and conductive material in electromagnetic fields by using electric or magnetic motive force conditions. [Analyze]	3	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Estimate the capacitance, inductance, mutual inductance, electronic wave, electric field intensity, electric flux density, magnetic flux density and Plane wave conditions for real-time problem. [Evaluate]	3	3	-	-	-	-	-	-	-	-	-	-	-	-
8	3EE4-21	Analog Electronics Lab	CO 1	Describe characteristics of BJT amplifier, Push-Pull amplifier, FET and UJT.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Measure variation of output power, distortion in load, ripple factor, line and load regulation in given analog circuits.	3	-	-	-	-	-	-	-	-	2	-	-	-	-
			CO 3	Apply the knowledge to compare and use Wein bridge oscillator and phase shift oscillator.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Investigate the effect of variation in R & C oscillator frequency in a team.	2	-	-	-	-	-	-	-	3	-	-	-	-	-
9	3EE4-22	Electrical Machine-I Lab	CO 1	Apply the principles of Electrical Machines through laboratory experimental work	3	-	-	-	-	-	-	-	-	-	-	2	3	-
			CO 2	Prepare reports based on performed experiments with effective demonstration of diagrams and characteristics / graph	-	-	-	-	-	-	-	-	3	-	-	2	-	-
			CO 3	Perform the experimental work on dc machines and transformers on virtual lab	-	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Demonstrate the starting & speed control of DC motors	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 5	Perform various tests, find efficiency & voltage regulation of electrical machines	-	2	-	-	-	-	-	-	-	-	-	-	-	-
10	3EE4-23	Electrical circuit design Lab	CO 1	Analyze data sheet reading and also acquiring knowledge for soldering and desoldering process [Apply] .	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Simulate the Electronic Circuit using semiconductor devices and sensors on a circuit design software tool and comparing the output analytically. [Analyze]	-	2	-	-	2	-	-	-	-	-	-	-	-	-
			CO 3	Contribute efficiently in a team so as to achieve the desired response of analog circuits consisting of semiconductor devices and sensors. [RESPONDING]	-	-	-	-	-	-	-	-	3	-	-	-	-	-
			CO 4	Demonstrate the solution to a problem of analog circuits consisting of semiconductor devices and sensors. [PRECISION]	-	2	-	-	-	-	-	-	-	-	-	-	-	-
11	3EE7-30	Industrial Training	CO 1	Implement classroom engineering knowledge in real-world industrial/laboratory situations in specific conditions. [Apply]	-	-	-	-	-	-	-	-	-	-	-	2	1	-
			CO 2	Test knowledge of advanced tools and techniques, as well as exposure to industry professional specific design approach. [Analyze]	-	-	-	-	3	-	-	-	-	-	-	2	-	-
			CO 3	Organize to the engineer's role and responsibilities, as well as the code of ethics. [Apply]	-	-	-	-	-	3	-	3	-	-	-	-	-	-

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16	4EE4-06	Power Electronics	CO 1	Analyze the power electronics devices like Diode, Thyristor, MOSFET and IGBT on the basis of their static and dynamic characteristics. [Analysis]	3	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Demonstrate the single phase and three phase converters with various types of loading conditions. [Apply]	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Implement the basic concepts of operation of dc-dc converters in steady state in continuous and discontinuous modes. [Apply]	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Discuss the operation and performance of inverters for the single phase and three phase for specialized applications.	3	-	-	-	-	-	-	-	-	-	-	2	-	-
17	4EE4-07	Signals & Systems	CO 1	Explain and characterize various continuous and discrete time signals.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Develop input-output relationship for LTI systems	-	3	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Apply the Laplace, Fourier and Z- transform for analyze of continuous-time and discrete-time signals and systems.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Use the technique of sampling and observe the effects of under sampling	3	1	-	-	-	-	-	-	-	-	-	-	-	-
18	4EE4-08	Digital Electronics	CO 1	Apply fundamental of logic gates and Boolean algebra to solve complex engineering problems of various digital applications	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Reduce Boolean expressions to design digital combinational circuits using appropriate minimization technique so as to propose a cost effective solution	-	3	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Implement a sequential circuit using flip-flops as required by the application to solve specific complex engineering problems	3	-	-	-	-	-	-	-	-	-	-	2	-	-
			CO 4	Configure analog to digital convertors and digital to analog convertors	3	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 5	Design a sequential circuit representing a system which can count using programmable logic devices	-	-	3	-	-	-	-	-	-	-	-	-	-	-
19	4EE4-21	Electrical Machine II Lab	CO 1	Apply the principles of Electrical Machines through laboratory experimental work.	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			CO 2	Prepare reports based on performed experiments with effective demonstration of diagrams and characteristics /graph	-	-	-	-	-	-	-	3	-	-	3	-	-	-
			CO 3	Develop the experimants on ac machines on virtual lab	-	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO 4	Demonstrate the control practices of AC rotating machines	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 5	Perform various tests, find efficiency & voltage regulation of AC rotating machines	-	2	-	-	-	-	-	-	-	-	-	-	-	-
20	4EE4-22	Power Electronics Lab	CO 1	Demonstrate the performance, characteristics, ratings, and applications of power diodes, power transistors, thyristors, DIACs, TRIACs, IGBTs, MOSFETs, GTOs, MCTs, and SITs. [Apply]	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO 2	Analyze the I-V characteristics of MOSFET, IGBT and UJT.	-	3	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Interpret the I-V characteristics of SCR, DIAC and TRIAC by using specilized software tool.	-	-	-	-	3	-	-	-	-	-	-	3	-	-
			CO 4	Illustrate the working of single phase half wave and full wave controlled rectifier design in a team.	-	-	-	-	-	-	-	3	-	-	-	-	-	-
21	4EE4-23	Digital Electronics Lab	CO 1	Develop the knowledge with proper understanding of number system and its application in digital electronics and compare different types of logic families [Apply]	3	-	-	-	-	-	-	-	-	-	-	3	-	-
			CO 2	Perform experiments with analysis on adder, subtractor, multiplexer and demultiplexer to verify truth table. [Analysis]	-	3	-	-	-	-	-	-	-	-	-	-	-	-
			CO 3	Design and model the various sequential circuits using switching speed, through put/latency, gate count and area, energy dissipation and power by Individual and team.	-	-	-	-	3	-	-	-	2	-	-	-	-	-

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12	8EE6-60.1	Energy Audit and Demand side Management	CO 2	Organize the Energy forecasting, Energy economics, Energy pricing and incentives, energy and its management, energy planning, and energy economics. energy auditing of motors, lighting system and building, by appropriate analysis methods through survey instrumentations. [Analyze]	2	1	-	-	-	-	-	-	-	-	-	-	-	-		
			CO 3	Examine the Electrical-Load Management and Demand side Management in transport, agriculture , household and commercial sectors. [Evaluate]	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
			CO 4	Investigate the pre or detail energy audit in lighting system, household and commercial buildings, agriculture, electric machinerye of an industry or organization. [Investigate]	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	
13	8EE6-60.2	Soft Computing	CO 1	Implement the various soft computing approaches for finding the optimal solutions and hence finding solutions by modern tools for specilized electrical engineering problems. [Apply]	3	-	-	-	-	-	-	-	-	-	-	-	2	-		
			CO 2	Compair the feasibility of applying a soft computing methodology for a particular problem and it's applicability to resolve the green energy or smart energy solutions. [Analyze]	-	3	-	-	-	-	-	-	-	-	-	-	-	-	2	
			CO 3	Justify soft computing technologies such as FL,NN,GA to optimize the design of complex systems. [Evaluate]	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO 4	Develop and synthesize any hybrid case study of AI system in specified engineering applications. [Analyze]	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	8EE4-21	Energy Systems Lab	CO 1	Demonstrate solar panels at various levels, solar Charge controller, PWM, MPPT with boost converter, Shadowing effect and diode based solution in Solar PV System by using large area Sun Simulator. [Apply]	3	-	-	-	-	-	-	-	-	-	-	1	-	-		
			CO 2	Categorize Performance of Solar Flat Plate Thermal Collector Operation with Variation in Mass Flow Rate and Level of Radiation. [Analyze]	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO 3	Compair wind turbine generators with DC generators, DFIG, PMSG etc. [Analyze]	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO 4	Write different components of Micro Grid, micro-hydel pumped storage system and Fuel Cell and its operation in a team	3	-	-	-	-	-	-	-	2	-	-	-	-	-	-	
			CO 5	Design and simulate hybrid wind-solar power generation along with Performance Assessment of Hybrid Power System by using Intelligent Controllers for on-grid and off-grid Hybrid Power Systems using modern tool. [Create]	-	-	-	-	2	-	-	-	-	-	-	-	-	3	-	
15	8EE7-50	Project	CO 1	Identify suitable, sustainable and societal as well as industrial issues to construct project title	3	-	-	-	-	3	3	-	-	-	-	-	2	-	-	
			CO 2	Conduct the litrature survey to analyze the methodology applicable to provided title considering finance management.	-	3	-	-	-	-	-	-	-	-	3	-	-	-	-	
			CO 3	Investigate data required for Design aspects and use of modern tool if specified by the group of students.	-	-	3	3	3	-	-	-	3	-	-	-	-	-	2	-
			CO 4	Follow the ethical practices throughout project executions	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
			CO 5	Prepare technical report and communicate Project findings with presentation skills and confidence level.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
			CO 6	Infer or provide concluding remarks of developed projects as life long learning and use of project outcomes in the field of smart energy solutions or green energy solutions if any.	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	3
Semester VIII Overall PO					2.64	2.50	2.00	3.00	2.50	3.00	3.00	3.00	2.50	3.00	3.00	3.00	1.50	2.33	2.33	

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1	Engineering Mathematics-I	CO1	Students will be able to define and explain basic concepts definite integrals, sequence and series, periodic functions and multivariable functions.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CO2	Students will be able to understand properties of beta and gamma function, convergence of sequence and series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	The students will be able to apply properties of beta and gamma functions and definite integrals to find surface area and volumes of revolution. They will be able to apply partial derivatives and multiple integrals to solve many problems in science and engineering.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Students will be able to analyse Fourier series to make many useful deductions which lay down foundation of signal processing and image processing.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Engineering Chemistry	CO1	Describe characteristics of water, fuel and Engineering materials-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Determine of hardness of water and calorific value of fuels for Industrial as well as domestic purposes	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Compare different techniques of water treatment, fuel analysis, Manufacturing of engineering materials and corrosion protection methods	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Prepare the generic drugs or medicines by identifying the applications of organic reaction mechanism and manufacturing of engineering materials	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	1	2
3	Communication Skills	CO1	Describe the process of communication, basics of Grammar and Writing and Literary Aspects	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
		CO2	Explain the types of communication, barriers and channels of communication and the concept of Literature through Short Stories and poetry		-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO3	Write and prepare professional reports, paragraph and business letters with the correct use of grammar	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		CO4	Discuss and illustrate the impact of social and moral values by implying the basics of English Writing Skills through literary aspects	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-

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		CO5	Restate and outline the basic areas of English Language Skills with the applications of literature	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
				-	-	-	-	-	-	-	2	-	2	-	2	-	-	-
4	Basic Mechanical Engineering	CO1	Students will be able to retrieve basic concepts of thermal and manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will able to compare different types of thermal and manufacturing processes and.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Students will able to annotating about the functioning of turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing process.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Student will be able to appraise the fundamental knowledge of thermal engineering, in addition to understanding of power transmission to solve the industrial and societal issues.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Basic Electrical Engineering	CO1	Identify basic components of electrical engineering and connect them to form different circuits to verify basic laws.Understanding	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Analyse the output of rectifier circuit,AC and DC machines to solve problems associated with Basic electrical engineering.Analyse	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
		CO3	Contribute efficiently in a team to acieve desired response of AC and DC Machines. Team Work	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		CO4	Demonstrate the output of rectifier circuits consistiong of basic components of electrical engineering. Mechanism	-	-	-	-	-	-	-	-	-	-	3	-	2	-	-
				2.5	3	-	-	-	-	-	-	3	-	3	-	1.5	-	-
6	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO3	Analyze different characteristics of water and fuel to solve societal and enviornmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-

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14	Programming for Problem Solving	CO2	Explain various memory units, representation of number system and Conditional, Iterative statements using arrays, string, pointers, file structure. (Understanding)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Examine the concept of algorithms, flowchart, Operators, Pointer, Array, String, structure, union using modularization to	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Illustrate the User Defined functions, Memory management and File concepts to solve real time problems using C Programming (Analyzing)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Basic Civil Engineering	CO1	Describe Scope, role and Specialization of Civil Engineering, basics of surveying, types of building, Plinth area, carpet area, floor space index, R.C.C., mode of transportation and different causes of pollution. (Remember)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain solid waste management, building by-laws, concept of sun light and ventilation, chemical and hydrological cycle, biodiversity, causes of road accident, sanitary landfill and on-site sanitation, food chain and food web, contour maps, Global warming, Climate Change, Ozone depletion, and Green House effect. (Understand)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Illustrate method of ranging and levelling, road safety measures, building component, environmental acts, different types of foundation, treatment and disposal of waste water, traffic sign and symbol and rain water harvesting. (Apply)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Compute errors in linear measurement, bearings and elevations of respective points on the ground. (Analyze)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Engineering Physics Lab	CO1	Operate the various devices for the multifarious use in the relative fields.	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-
		CO2	Apply knowledge of Newton’s Ring,grating, spectrometer,Optical fiber ,Sextant, Hall effect , a n d L a s e r to determine wavelength of light, dispersive power,Numerical aperature Height of Object, Hall coefficient, coherence length and coherence time	2		-	-	-	-	-	-	1	-	-	-	-	-	-
		CO3	To conduct the experiments with interest and an attitude of learning.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-

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				2	2	3	2	-	-	-	-	-	-	-	-	2	2	-
4	Data Structures and Algorithms	CO 1	To explain data structures and their use in daily life .	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 2	To analyze the Linear and non Linear data structures like stack, Queues, link list, Graph, Trees to solve real time problems.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To develop searching and sorting algorithms on predefine data	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To create the data structures in specific areas like DBMS ,Compiler, Operating system.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	3	3	-	-	-	-	-	-	-	-	-	2	2
5	Object Oriented Programming	CO 1	Apply the various programming paradigms such as exception handling, polymorphism in software pattern	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	Analyze the C++ programs using different programming methodologies.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	Design the elements of the object oriented concepts in developing structured programs.	-	-	3	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	Investigate the real time applications using advance C++ concepts.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	3	-	-	-	-	-	-	-	-	3	2	3
6	Software Engineering	CO 1	To Demonstrate software life cycle models with respect to software engineering principles.	2	-	-	-	-	-	-	-	-	-	-	-	3	-	2
		CO 2	To analyse cost estimation technique and risk analysis techniques in software engineering projects.	-	2	-	-	-	-	-	-	-	-	-	-	2	3	-
		CO 3	To Design Software requirement document (SRS)	-	-	3	-	-	-	-	-	-	-	-	-	2	3	-
		CO 4	To synthesize UML diagrams using the concepts of object oriented analysis in software development process.	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	3	-	-	-	-	-	-	-	-	2.5	3	2
		LO1	To Utilize searching and sorting algorithms on given values.	2	-	-	-	2	-	-	-	-	2	-	-	2	-	-

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24	Compiler Design	CO 3	To Evaluate the different types of error and convert the code in I.C.G.	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To convert the optimized code into the machine code in the storage organisation and code optimization.	-	-	-	3	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	3	3	-	-	-	-	-	-	-	-	2.5	2	2
25	Operating System	CO 1	To demonstrate the knowledge of Operating System services including Memory, Device & File Management.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	2
		CO 2	To categorize the Process management in terms of inter process communication and memory management methods for	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To Design the solution for scheduling and deadlock problems in operating system using appropriate algorithms such as round	-	-	2	-	-	-	-	-	-	-	-	-	3	-	2
		CO 4	To investigate LINUX/UNIX, OS, RTOS, windows and Mobile based OS file system through case study.	-	-	-	3	-	-	-	-	-	-	-	-	2	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	3	-	-	-	-	-	-	-	-	2.5	2	2
26	Computer Graphics & Multimedia	CO 1	Demonstrate the standards and Primitives of Drawing components like line, circle, ellipse, clipping, filling	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Analyze the graphics quality with the help 3D Graphics and Projections	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	Design the animation using transformation and clipping	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2
		CO 4	Organize the primitives for Illumination, Shading and Color Models.(Evaluate)	-	-	-	2	-	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	-	2	2	2.5
27	Cyber Space Operations and Design	CO 1	Analyze and evaluate the cyber security needs of an organization.	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	Design and develop a security architecture for an organization.	-	-	3	3	-	-	-	-	-	-	2	-	2	-	-

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		CO 5	Design operational and strategic cyber security strategies and policies.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				2.5	3	3	3	-	-	-	-	-	-	2	-	2	-	-	
28	Digital Forensics and Incident Response	CO 1	conduct digital investigations that conform to accepted professional standards and are based on the investigative	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
		CO 2	identify and document potential security breaches of computer data that suggest violations of legal, ethical, moral, policy,	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	apply a solid foundational grounding in computer networks, operating systems, file systems, hardware, and mobile devices	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	access and critically evaluate relevant technical and legal information and emerging industry trends.	-	-	3	-	3	-	-	-	-	-	3	-	2	-	-	-
		CO 5	Communicate effectively the results of a computer, network, and/or data forensic analysis verbally, in writing, and in	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2.5	3	3	-	3	-	-	-	-	-	3	-	2	-	-	-
29	Analysis of Algorithms	CO 1	Understand complexity of an algorithm, asymptotic notation and divide and conquer method for developing an algorithm.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	Analyze the algorithm design using greedy algorithm and dynamic programming.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To Create search for problem solution using backtracking, branch and bound and pattern matching algorithm	-	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	To synthesize the randomized algorithm, assignment problem and types of classes such as P, NP, and NP Complete.	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	2	-	-	-	-	-	-	-	-	-	2.5	-	2
30	Wireless Communication	CO 1	To Classify the challenges with transmission of signals in wireless communication systems and Cellular architechture	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	To Analyze the measures to increase the capacity in GSM systems- sectorization and Spatial Filtering for Interference	-	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To formulate cell architecture in wirless communication sytem.	-	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To Distinguish digital signaling techniques for lossy channels.	-	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	3	2	-	-	-	-	-	-	-	-	-	2.5	2	-

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34	Digital Forensics and Incident Response	CO 3	apply a solid foundational grounding in computer networks, operating systems, file systems, hardware, and mobile devices	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	access and critically evaluate relevant technical and legal information and emerging industry trends.	-	-	3	-	3	-	-	-	-	-	3	-	2	-	-
		CO 5	Communicate effectively the results of a computer, network, and/or data forensic analysis verbally, in writing, and in	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2.5	3	3	-	3	-	-	-	-	-	3	-	2	-	-
35	Computer Graphics & Multimedia Lab	LO1	to apply the concepts of transformation techniques on 2D & 3D objects.	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	to analyze the colour modelling, shading and animation on graphic objects.	-	3	-	-	-	-	-	-	-	-	-	-	2	-	3
		LO3	to design the graphical primitives drawing algorithms such as line, circle drawing algorithms.	-	-	3	-	-	-	-	-	-	-	-	-	2	-	3
		LO4	to Generate Fractal images using graphics tool like Sterling	-	-	-	2	2	-	-	-	-	-	-	-	3	-	-
		LO5	to make a project to solve real life society based problem and demonstrate following PO related capabilities:	-	-	-	-	-	3	3	3	3	3	3	3	3	2	3
				2	3	3	2	2	3	3	3	3	3	3	3	2.4	2	3
36	Compiler Design Lab	LO1	To Analysis the finite state machines, lexical analyzer, parser for the grammar.	-	-	-	-	-	-	-	-	3	-	-	-	3	-	-
		LO2	To Develop recognition of identifiers, constants, comments, operators, loops and keywords, and generation of parse tree and syntax tree, symbol table.	-	-	-	-	3	-	-	-	-	-	-	-	2	-	-
		LO3	To Design intermediate code genrator and converted into optimized code	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-
		LO4	To demonstrate hands on experience of working on system software.	-	-	-	-	-	3	-	-	-	-	-	-	-	3	-
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	3	3	-	-	3	-	-	-	2.333	3	-
37	Analysis of Algorithms Lab	LO1	Apply sorting algorithms like quick sort for information searching.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		LO2	Identify problems to be broken down into simple sub problems using merge sort algorithm	-	-	-	3	-	-	-	-	-	-	-	-	-	3	-
		LO3	Device solutions using topological ordering to quickly compute shortest paths	-	-	2	-	-	-	-	-	-	-	-	-	-	3	-
		LO4	Demonstrate real world scenarios like resource allocation using knapack algorithm	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-

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				3	3	3	-	-	-	-	-	-	-	-	-	2.5	-	3	
46	CYBER FORENSICS	CO 1	Understand the basic terminology of cybercrimes	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	Apply a number of different computer forensic tools to a given scenario	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	Understand the basics of computer forensics	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	Analyze and validate digital evidence data	-	-	2	-	2	-	-	-	-	-	-	-	-	-	2	-
		CO 5	Analyze acquisition methods for digital evidence related to system security	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
				2	2	2	-	2	-	-	-	-	-	-	-	-	3	2	2
46	ETHICAL HACKING AND DIGITAL FORENSICS	CO 1	Outline the vulnerabilities in a system or network using computer forensic fundamentals.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	Demonstrate a critical evaluation of an advanced security topic with an independent project.	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	Analyze and critically evaluate techniques used to break into an insecure web application and identify relevant counter measures.	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-
		CO 4	Evaluate the potential counter measures to advanced hacking techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	3	-	-	-	-	-	-	-	-	-	3	3	3
46	Distributed System	CO 1	To generalize the basic elements and design architectures in distributed system.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
		CO 2	To analyze the concurrent processes, inter process communication and RPC and RMI case studies in	-	2	-	-	-	-	-	-	-	-	-	-	-	2	2	-
		CO 3	To study process scheduling, implementation and file systems along with corresponding case studies.	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To analyze the memory sharing and failures, deadlock handling in distributed system architecture.	-	-	-	2	-	-	-	-	-	-	-	-	-	3	-	-

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59	Big Data Analytics	CO 2	To identify the input-output methods like writeable interface and serialization in Hadoop platform.	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-	
		CO 3	To produce and validate the Map Reduce programming models of big data analytics	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	
		CO 4	To describe/demostrate Pig and Hive architecture and their programming model such as HQL, Pig script.	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	2	-	-	-	-	-	-	-	-	2	-	-
60	IPR, Copyright and Cyber Law of India (Open Elective-II)	CO 1	To classify the concept of cybercrime offence in cyber space and Intellectual Property Rights in terms of copyright, patent	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
		CO 2	To analyse the administrator & conventions of Intellectual Property Rights with special reference to India and abroad.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To generalize intellectual property laws including the copyright law, patents law, designs and trademark law with appropriate	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	To conclude the Jurisdiction Issues in Cyber Space and intellectual property for conventions in India, United Kingdom	-	-	-	3	-	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2	2	3	-	-	-	-	-	-	-	-	-	2	-	-
61	Big Data Analytics (Open Elective-II)	CO 1	To apply the fundamentals of Big Data analytics in Hadoop	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	To analyze the input-output methods like writeable interface and serilization in Hadoop platform.	-	2	-	-	-	-	-	-	-	-	-	-	-	3	-	3
		CO 3	To design the Map Reduce programming models of big data analytics.	-	-	2	-	-	-	-	-	-	-	-	-	-	3	2	-
		CO 4	To evaluate of Pig and Hive architecture and their programming model such as HQL, Pig script.	-	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	-	-	3	2	3
62	Big Data	LO1	To Understand Big Data and its analytics in the real world	3		-	-	-	-	-	-	-	-	-	-	3	-	-	
		LO2	To Analyze the Big Data framework like Hadoop and NOSQL to efficiently	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		LO3	To Implement Big Data Activities using Hive	-	-	-	-	-	-	-	-	-	-	-	-	3	-	3	-

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62	Analytics Lab																		
				3	3	-	-	-	-	-	-	-	-	-	3	3	3	-	
63	Software Testing and Validation Lab	LO1	To understand the process of manual testing or automation testing by writing test plan and test cases based on different	-	-	-	-	-	3	-	-	-	-	-	3	-	3	-	
		LO2	To analyse the mutation score using various tools like jumble testing tool.	-	-	-	-	3	-	-	-	-	-	-	3	-	-	-	
		LO3	To analyse the performance of commercial websites using different automation tools like jmeter.	-	-	-	-	-	-	-	-	3	-	-	3	3	-	-	
		LO4	To calculate the coverage analysis of programs using different automation tools like Eclemma tool.	-	-	-	-	-	-	-	-	-	3	-	3	-	-	-	
					-	-	-	-	3	3	-	-	3	3	-	3	3	3	-
64	Project	CO 1	Apply fundamental knowledge of basic Computer Engineering courses for solving complex Engineering problem	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	Analyze the literature, identify problem, its context with real world / industry issue and define problem statement	-	3	-	-	-	-	-	-	-	-	-	-	-	2	3	-
		CO 3	Design engineering solution to the problem using knowledge of core Computer engineering	-	-	3	-	-	-	-	-	-	-	-	-	-	3	3	-
		CO 4	Carryout experimentations/simulations and investigate the solution to complex Computer engineering problem	-	-	-	3	-	-	-	-	-	-	-	-	3	2	2	3
		CO 5	Use modern tools and techniques of Computer engineering for solving the problem	-	-	-	-	3	-	-	-	-	-	-	-	-	2	3	-
		CO 6	Analyse sustainability of proposed solution and its impact on environment & applicability of solution in industry and societal	-	-	-	-	-	3	3	-	-	-	-	-	-	3	-	3
		CO 7	Understand professional ethics, rules and regulations while working on interdisciplinary issues and financial management	-	-	-	-	-	-	-	3	-	-	3	-	-	2	3	3
		CO 8	demonstrate the ability to lead and productively participate in group situations and to use oral communication effectively	-	-	-	-	-	-	-	-	-	3	3	-	-	3	3	-
				3	3	3	3	3	3	3	3	3	3	3	3	3	2.5	2.833	3
		IPR, Copyright	CO 1	To Determine and analyse the domain name system (DNS) in internet and various cybercrime offence in cyber space.	3	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO 2	To understand the concept of Intellectual Property and Intellectual Property Rights with special reference to India and		-	-	-	-	-	-	-	-	3	-	-	-	-	1	-	-	

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		CO 6	Understand applicability of solution in industry and societal issues	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-	
		CO 7	Analyse sustainability of proposed solution and its impact on environment	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
		CO 8	Understand professional ethics, rules and regulations while working on interdisciplinary issues	-	-	-	-	-	-	-	2	-	-	-	-	-	-	3	-
				2	3	3	3	2	2	2	2	-	-	-	-	2.667	2.667	3	
69	Composite Materials	CO 1	Explain the basics of composites, its structure and its properties	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	Compute the physio-mechanical properties of composites from tests	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 3	Assessment of engineering properties of composite materials	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 4	Analyze the failure and maintenance of composite materials	1	-	1	1	1	-	-	-	-	-	-	-	-	1	-	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	-	-	-	-	-	-	-	1	-	1	
70	Fire and Safety Engineering	CO 1	Explain the fundamentals of Fire Engineering	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-	
		CO 2	Apply the learned principles in planning, designing and management of fire safe buildings	2	1	1	-	1	1	-	-	-	-	1	-	1	1	-	
		CO 3	Assess fire fighting installations, control technologies and hazardous materials	1	2	1	-	1	1	-	-	-	-	-	-	1	1	1	
		CO 4	Design of fire safety building for fire resitant construction by following safety legislation	1	-	1	1	1	1	-	1	-	-	-	-	-	1	1	
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	1	-	1	-	-	1	-	1	1	1	
71	Industrial and Biomedical applications of RF Energy	CO 1	Understanding of basic concepts and Principles of EM wave, propagation reflection and transmission. [Understanding]	3	2	-	-	-	-	-	-	3	-	-	-	-	1	-	
		CO 2	Apply the knowledge for interest in complex dielectric constant, dipolar loss mechanism and design mechanism to understand	3	2	-	-	-	-	-	-	-	3	-	-	-	1	-	-
		CO 3	Analyze the structure of RF heating in industrial application. [Analyzing]	3	2	3	-	-	-	-	-	-	3	-	-	-	-	1	-
		CO 4	Design of Hazards and safety standards in various engineering problem. [Create & Design].	3	3	3	3	-	-	-	-	-	3	-	-	-	-	1	-

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		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2.25	3	3	-	-	-	-	3	-	-	-	1	1	-
72	Robotics and control	CO 1	Understand the fundamentals of robotics and its components, methods of linear motion into rotary motion and vice-verse.	3	3	2	2	2	3	3	3	2	-	3	3	2	-	-
		CO 2	Apply the appropriate techniques for movement of robotic joints with computers/microcontrollers. [Applying &	3	2	2	2	-	3	2	-	3	2	3	3	2	-	-
		CO 3	Analyze parameters required to be controlled in a Robot for specific application. [Analyzing]	3	2	3	3	3	3	-	-	2	2	2	3	2	-	-
		CO 4	Design and Develop small automatic / autotronics applications with the help of Robotics for solving the real life problems	2	2	3	2	2	2	2	3	3	2	2	3	2	-	2
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2.75	2.25	2.5	2.25	2.333	2.75	2.333	3	2.5	2	2.5	3	2	-	2
73	Energy Audit and Demand side Management	CO 1	understand the current Energy Scenarios in India.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	understand the energy auditing of motors, lighting system and building, by appropriate analysis methods through survey	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 3	understand the Electrical-Load Management and Demand side Management.	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
		CO 4	apply the Energy Conservation in transport, agriculture , household and commercial sectors.	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2.333	2	1	-	-	-	-	-	-	-	-	-	-	-
74	Soft Computing	CO 1	Learn about soft computing techniques and their applications.	2	2	3	-	-	-	-	-	-	-	-	-	2	3	3
		CO 2	Analyze various neural network architectures.	2	2	3	-	-	-	-	-	-	-	-	-	2	2	3
		CO 3	Define the fuzzy systems	-	-	3	-	-	-	-	-	-	-	-	-	2	2	3
		CO 4	Understand the genetic algorithm concepts and their applications	3	2	3	-	-	-	-	-	-	-	-	-	2	2	3
		CO 5	Identify and select a suitable Soft Computing technology to solve the problem.	3	3	3	-	-	-	-	-	-	-	-	-	3	3	3
				2.5	2.25	3	-	-	-	-	-	-	-	-	-	2.2	2.4	3

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1	Engineering Mathematics-I	CO1	Students will be able to define and explain basic concepts definite integrals, sequence and series, periodic functions and multivariable functions.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will be able to understand properties of beta and gamma function, convergence of sequence and series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	The students will be able to apply properties of beta and gamma functions and definite integrals to find surface area and volumes of revolution. They will be able to apply partial derivatives and multiple integrals to solve many problems in science and engineering.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Students will be able to analyse Fourier series to make many useful deductions which lay down foundation of signal processing and image processing.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Engineering Chemistry	CO1	Describe characteristics of water, fuel and Engineering materials-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Determine of hardness of water and calorific value of fuels for Industrial as well as domestic purposes	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Compare different techniques of water treatment, fuel analysis, Manufacturing of engineering materials and corrosion protection methods	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Prepare the generic drugs or medicines by identifying the applications of organic reaction mechanism and manufacturing of engineering materials	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	1	2
3	Communication Skills	CO1	Describe the process of communication, basics of Grammar and Writing and Literary Aspects	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Explain the types of communication, barriers and channels of communication and the concept of Literature through Short Stories and poetry	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Write and prepare professional reports, paragraph and business letters with the correct use of grammar	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
		CO4	Discuss and illustrate the impact of social and moral values by implying the basics of English Writing Skills through literary aspects	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-

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CO-PO Mapping (Session 2023-24)																		
		CO5	Restate and outline the basic areas of English Language Skills with the applications of literature	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
				-	-	-	-	-	-	-	2	-	2	-	2	-	-	-
4	Basic Mechanical Engineering	CO1	Students will be able to retrieve basic concepts of thermal and manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will able to compare different types of thermal and manufacturing processes and.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Students will able to annotating about the functioning of turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing process.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Student will be able to appraise the fundamental knowledge of thermal engineering, in addition to understanding of power transmission to solve the industrial and societal issues.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Basic Electrical Engineering	CO1	Identify basic components of electrical engineering and connect them to form different circuits to verify basic laws.Understanding	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Analyse the output of rectifier circuit,AC and DC machines to solve problems associated with Basic electrical engineering.Analyse	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
		CO3	Contribute efficiently in a team to acieve desired response of AC and DC Machines. Team Work	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
		CO4	Demonstrate the output of rectifier circuits consistiong of basic components of electrical engineering. Mechanism	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-
				2.5	3	-	-	-	-	-	3	-	3	-	1.5	-	-	-
6	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
		CO3	Analyze different characteristics of water and fuel to solve societal and enviornmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO4	Students will show an ability to work as a team member ethically	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-
				1	-	-	-	-	-	2	2	2.5	-	-	-	-	-	-
		CO1	Use and pronounce the words correctly.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-

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CO-PO Mapping (Session 2023-24)																		
9	Software Engineering Lab	LO3	Create Data Flow Diagrams for different systems.	-	-	3	-	-	-	-	-	-	-	-	-	-	3	2
		LO4	Understand and develop UML diagrams of various structures and behaviors.	-	-	-	-	2	-	-	-	-	-	-	-	2	3	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	-	3	3	2	-	-	-	-	-	-	-	2.5	3	2
10	Digital Electronics Lab	LO1	Apply appropriate basic logic gates for verifying the truth tables.	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	Demonstrate ability for recognizing any IC and its functionality.	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	Design any basic gates by the use of universal gates.	-	-	3	-	-	-	-	-	-	-	-	-	-	2	-
		LO4	Identify the limitation of basic logic gates while designing any SOP and POS logics.	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
		LO5	Design any sequential and combinational circuits using basic gates as well as by defined IC.	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		LO6	Demonstrate the working of Digital Trainer kits and usability of it.	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-
		LO7	Debug a circuit to find a problem and suggest suitable solution.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
		LO8	Able to work in a team for designing and rectifying any errors in the digital circuit.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
				2	2	2.5	2	2	-	-	-	2	-	-	2	2	2	2
11	Industrial Training	LO1	Capability to acquire and apply fundamental principles of engineering.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	Become master in one's specialized technology and updated with all the latest changes in technological world for designing real time project in industry.	-	-	-	-	3	-	-	-	-	-	3	-	3	-	3
		LO3	Ability to communicate efficiently	-	-	-	-	-	-	-	-	-	3	-	-	2	-	-
		LO4	Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.	-	-	-	-	-	-	-	-	3	-	-	-	2	2	3
		LO5	Ability to identify, formulate and model problems and find engineering solution based on a systems approach.	-	-	-	3	-	3	-	-	-	-	-	-	2	2	-
		LO6	Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.	-	-	-	-	-	-	-	-	-	-	-	3	2	-	3
		LO7	Awareness of the social, cultural, global and environmental responsibility as an engineer.	-	-	-	-	-	-	3	2	-	-	-	-	-	2	-
				3	-	-	3	3	3	3	2	3	3	3	3	2.167	2	3

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B. Tech (Computer Science and Engineering) (Artificial Intelligence)																		
CO-PO Mapping (Session 2023-24)																		
12	Discrete Mathematics Structure	CO1	Define mathematically about the fundamental data types and structures used in computer algorithms and systems.	1	-	-	-	-	-	-	-	-	-	-	-	2	1	-
		CO2	Classify algebraic techniques to basic discrete structures and algorithms.	2	-	-	-	-	-	-	-	-	-	-	-	2	1	-
		CO3	Apply mathematical logic in making computer programs, computer circuits, concluding experiments, digital electronics, etc.	3	-	-	-	-	-	-	-	-	-	-	-	1	1	-
		CO4	Analyze a variety of graphs and Compare the viability of different approaches to the Model problems in Computer Science.	-	3	-	-	-	-	-	-	-	-	-	-	1	1	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	-	-	-	-	-	-	-	-	-	-	1.5	1	-
13	Technical Communication	CO1	Remember the fundamental principles of technical writing and genre in written communication within technical domains.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
		CO2	Understand the intricacies of planning, drafting, revising, editing, and critiquing professional documents within the realm of technical communication when engaging in both individual and collaborative writing.	-	-	-	-	-	-	-	-	3	-	-	1	-	-	-
		CO3	Apply skills in note-making, grammar editing, technical style, project report creation, and LSWR (Listening, Speaking, Writing, Reading) in the context of technical communication.	-	-	-	-	-	-	-	-	3	-	-	-	-	-	2
		CO4	Evaluate research findings and synthesize content for various business communication documents, such as emails, resumes, meeting minutes, technical reports, articles, and project proposals.	-	-	-	-	-	-	-	-	-	-	3	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	2	3	-	3	1	-	-	2.5
14	Microprocessor & Interfaces	CO1	To Examine the architecture of 8085 microprocessor, Memory and its type.	3	-	-	-	-	-	-	-	-	-	-	2	-	-	-
		CO2	To Analyse interfacing applications using microprocessors and peripherals.	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-
		CO3	To Design Assembly Language Programs by using instructions of 8085.	-	-	2	-	-	-	-	-	-	-	-	2	-	-	-
		CO4	To investigate the connection of the microprocessor with the peripheral devices.	-	2	-	-	-	-	-	-	-	-	-	2	-	-	-

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CO-PO Mapping (Session 2023-24)																		
				2	3	3	2	2	3	3	3	3	3	3	3	2.4	2	3
36	Compiler Design Lab	LO1	To Analysis the finite state machines, lexical analyzer, parser for the grammar.	-	-	-	-	-	-	-	-	3	-	-	-	3	-	-
		LO2	To Develop recognition of identifiers, constants, comments, operators, loops and keywords, and generation of parse tree and syntax tree, symbol table.	-	-	-	-	3	-	-	-	-	-	-	-	2	-	-
		LO3	To Design intermediate code genrator and converted into optimized code	-	-	-	-	-	-	-	-	3	-	-	-	2	-	-
		LO4	To demonstrate hands on experience of working on system software.	-	-	-	-	-	3	-	-	-	-	-	-	-	3	-
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	-	-	3	3	-	-	3	-	-	-	2.333	3	-
37	Analysis of Algorithms Lab	LO1	Apply sorting algorithms like quick sort for information searching.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		LO2	Identify problems to be broken down into simple sub problems using merge sort algorithm	-	-	-	3	-	-	-	-	-	-	-	-	-	3	-
		LO3	Device solutions using topological ordering to quickly compute shortest paths	-	-	2	-	-	-	-	-	-	-	-	-	-	3	-
		LO4	Demonstrate real world scenarios like resource allocation using knapack algorithm	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-
		LO5	From a given vertex, Select Dijkstra's algorithm to find the shortest path to other vertices	-	-	-	-	2	-	-	-	-	-	-	-	-	-	3
		LO6	Demonstrate minimum cost spanning tree of a given undirected graph using kruskal's algorithm	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
				3	-	2	3	2	-	-	-	-	-	-	2	3	2.667	3
38	Advance Java Lab	LO1	To apply event handling on AWT and Swing components.	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
		LO2	To Design a page using Swing , Servlet , JSP and JDBC connectivity.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	-
		LO3	To create a project based on societal problem.	-	-	-	-	-	3	-	-	-	-	-	-	-	3	-
		LO4	To map java classes and object associations to relational database tables with Hibernate mapping files.	-	-	-	-	-	-	3	-	-	-	-	-	-	3	3
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				-	-	3	-	3	3	3	-	-	-	-	-	3	3	3
		LO1	Capability to acquire and apply fundamental principles of engineering.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	Become master in one's specialized technology and updated with all the latest changes in technological world for designing real time project in industry.	-	-	-	-	3	-	-	-	-	-	3	-	3	-	3

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B. Tech (Computer Science and Engineering) (Artificial Intelligence)																		
CO-PO Mapping (Session 2023-24)																		
67	Testing and Validation Lab	CO 4	Analyze the design of test cases for different testing techniques.	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	-	-	3	-	-	-	-	-	-	-	3	2	-
68	Project	CO 1	Apply fundamental knowledge of basic Computer Engineering courses for solving complex Engineering problem	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	Analyze the literature, Identify problem, its context with real world / industry issue and define problem statement	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-
		CO 3	Design engineering solution to the problem using knowledge of core Computer engineering	-	-	3	-	-	-	-	-	-	-	-	-	3	3	-
		CO 4	Carryout experimentations/simulations and investigate the solution to complex Computer engineering problem	-	-	-	3	-	-	-	-	-	-	-	-	-	2	3
		CO 5	Use modern tools and techniques of Computer engineering for solving the problem	-	-	-	-	2	-	-	-	-	-	-	-	2	3	-
		CO 6	Understand applicability of solution in industry and societal issues	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-
		CO 7	Analyse sustainability of proposed solution and its impact on environment	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO 8	Understand professional ethics, rules and regulations while working on interdisciplinary issues	-	-	-	-	-	-	-	2	-	-	-	-	-	3	-
				2	3	3	3	2	2	2	2	-	-	-	-	2.667	2.667	3
69	Composite Materials	CO 1	Explain the basics of composites, its structure and its properties	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	Compute the physio-mechanical properties of composites from tests	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 3	Assessment of engineering properties of composite materials	1	2	1	-	-	-	-	-	-	-	-	-	-	-	1
		CO 4	Analyze the failure and maintenance of composite materials	1	-	1	1	1	-	-	-	-	-	-	-	1	-	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	-	-	-	-	-	-	-	1	-	1
70	Fire and Safety Engineering	CO 1	Explain the fundamentals of Fire Engineering	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-
		CO 2	Apply the learned principles in planning, designing and management of fire safe buildings	2	1	1	-	1	1	-	-	-	-	1	-	1	1	-
		CO 3	Assess fire fighting installations, control technologies and hazardous materials	1	2	1	-	1	1	-	-	-	-	-	-	1	1	1
		CO 4	Design of fire safety building for fire resitant construction by following safety legislation	1	-	1	1	1	1	-	1	-	-	-	-	-	1	1

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Department of Advance Computing

B. Tech in Computer Science and Engineering (Cyber Security)

CO-PO Mapping (Session 2023-24)

S.No	Course Name	CO No	Course Outcomes (After completing the course students will be able to.....)	PO 1: Engine er knowl	PO 2: Probl em analys	PO 3: Desig n/deve lopme	PO 4: Condu ct investi	PO 5: Mode rn tool	PO 6: The engine er and	PO 7: Envir onme nt and	PO 8: Ethics : Apply	PO 9: Indivi dual and	PO 10: Com munic	PO 11: Proje ct	PO 12: Life- long	PSO1- The ability to	PSO2- The ability to	PSO3- The ability to
1	Engineering Mathematics-I	CO1	Students will be able to define and explain basic concepts definite integrals, sequence and series, periodic functions and multivariable functions.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will be able to understand properties of beta and gamma function, convergence of sequence and series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	The students will be able to apply properties of beta and gamma functions and definite integrals to find surface area and volumes of revolution. They will be able to apply partial derivatives and multiple integrals to solve many problems in science and engineering.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Students will be able to analyse Fourier series to make many useful deductions which lay down foundation of signal processing and image processing.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Engineering Chemistry	CO1	Describe characteristics of water, fuel and Engineering materials-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Determine of hardness of water and calorific value of fuels for Industrial as well as domestic purposes	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Compare different techniques of water treatment, fuel analysis, Manufacturing of engineering materials and corrosion protection methods	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Prepare the generic drugs or medicines by identifying the applications of organic reaction mechanism and manufacturing of engineering materials	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	1	2
3	Communication Skills	CO1	Describe the process of communication, basics of Grammar and Writing and Literary Aspects	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Explain the types of communication, barriers and channels of communication and the concept of Literature through Short Stories and poetry	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Write and prepare professional reports, paragraph and business letters with the correct use of grammar	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
		CO4	Discuss and illustrate the impact of social and moral values by implying the basics of English Writing Skills through literary aspects	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-

		CO5	Restate and outline the basic areas of English Language Skills with the applications of literature	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
				-	-	-	-	-	-	-	2	-	2	-	2	-	-	-
4	Basic Mechanical Engineering	CO1	Students will be able to retrieve basic concepts of thermal and manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will able to compare different types of thermal and manufacturing processes and.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Students will able to annotating about the functioning of turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing process.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Student will be able to appraise the fundamental knowledge of thermal engineering, in addition to understanding of power transmission to solve the industrial and societal issues.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Basic Electrical Engineering	CO1	Identify basic components of electrical engineering and connect them to form different circuits to verify basic laws.Understanding	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Analyse the output of rectifier circuit,AC and DC machines to solve problems associated with Basic electrical engineering.Analyse	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
		CO3	Contribute efficiently in a team to acieve desired response of AC and DC Machines. Team Work	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		CO4	Demonstrate the output of rectifier circuits consistiong of basic components of electrical engineering. Mechanism	-	-	-	-	-	-	-	-	-	-	3	-	2	-	-
				2.5	3	-	-	-	-	-	-	3	-	3	-	1.5	-	-
6	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO3	Analyze different characteristics of water and fuel to solve societal and enviornmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO4	Students will show an ability to work as a team member ethically	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-
				1	-	-	-	-	-	-	2	2	2.5	-	-	-	-	-
7	Language Lab	CO1	Use and pronounce the words correctly.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Acquire knowledge of the correct expressions,vocabulary etc. in personal and professional lives.	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Plan successfully for leadership and teamwork,crack GD's, interviews and other professional activities.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO4	Synthesize the process of communication using LSRW.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
				-	-	-	-	-	-	-	-	2	2	-	-	-	-	-

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				1.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Human Values	CO1	Relate sustained happiness through identifying the essentials of human values and skills	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
		CO2	Find the happiness and human values in terms of personal and social life to create harmony in them	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
		CO3	Use and understand practically the importance of trust, mutually satisfaction and human relationship	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
		CO4	Identify the orders of nature for the holistic perception of harmony for human existence	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO5	Implement professional ethics and natural acceptance of human values in his/her life	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
				-	-	-	-	-	2	-	2.5	-	-	-	2	-	-	-
14	Programming for Problem Solving	CO1	Understand the basic concepts of fundamental of computer system, number system and programming. (Remembering)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain various memory units, representation of number system and Conditional, Iterative statements using arrays, string, pointers, file structure. (Understanding)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Examine the concept of algorithms, flowchart, Operators, Pointer, Array, String, structure, union using modularization to illustrate the User Defined functions, Memory management and File concepts to solve real time problems using C Programming (Analyzing)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	File concepts to solve real time problems using C Programming (Analyzing)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Basic Civil Engineering	CO1	Describe Scope, role and Specialization of Civil Engineering, basics of surveying, types of building, Plinth area, carpet area, floor space index, R.C.C., mode of transportation and different causes of pollution. (Remember)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain solid waste management, building by-laws, concept of sun light and ventilation, chemical and hydrological cycle, biodiversity, causes of road accident, sanitary landfill and on-site sanitation, food chain and food web, contour maps, Global warming, Climate Change, Ozone depletion, and Green House effect. (Understand)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Illustrate method of ranging and levelling, road safety measures, building component, environmental acts, different types of foundation, treatment and disposal of waste water, traffic sign and symbol and rain water harvesting. (Apply)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Compute errors in linear measurement, bearings and elevations of respective points on the ground. (Analyze)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO1	Operate the various devices for the multifarious use in the relative fields.	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-

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		CO4	Understand and Analyze transaction processing and concurrency control concepts.	--	-	2	-	-	-	-	-	-	-	-	-	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	2	-	-	-	-	-	-	-	-	2	2.5	-
16	Theory of Computation	CO 1	To demonstrate basic concepts of computation	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze language expressions and Grammars in finite automata.	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To design the solutions of computation problem using suitable machines	-	-	2	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To apply the concepts of Computation in real life problems .	-	-	-	2	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	2	-	-	-	-	-	-	-	2	2	2.5
17	Data Communication and Computer Networks	CO1	To explain networking models and data trasmission	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO2	Apply the the Error Detection and Correction techniques.	2	-	-	-	-	-	-	-	-	-	-	2	-	2
		CO3	To analyze the network Layer routing algorithms.	-	2	-	-	-	-	-	-	-	-	-	2	-	2
		CO4	examine the transport and application layers protocol service	-	2	-	-	-	-	-	-	-	-	-	2	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	2	-	2
18	Microprocessor & Interfaces Lab	LO1	To familriaze with the architecture and instruction set of Intel 8085	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	To demonstrate operation of typical 8085 microprocessor trainer kit	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	To provide practical hands on experience with Assembly Language Programming	-	-	-	-	-	-	-	-	-	2	-	-	-	2
		LO4	To analyze limitations and applications of Assembly language Programming for the real world problem	-	-	-	-	-	-	-	-	-	-	2	-	-	2
		LO5	To get familiarize with interfacing of various peripheral devices using 8085 chip	-	-	1	-	-	-	-	-	-	-	-	2	-	-
				2	2	1	-	-	-	-	-	-	2	2	2	-	2
		LO1	Select appropriate technique to design database and schemas for a given application using DDL/DML SQL commands	-	-	2	-	2	-	-	-	-	-	1	2	-	-
		LO2	Apply the concept of integrity Rules and Constraints to ensure accurate and error free data	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	Identify solutions for database update using pre store Procedures and Triggers	-	-	2	-	-	-	-	-	-	-	2	-	-	-

23	Information Theory & Coding	CO 3	Design the linear block code and cyclic code for error free communication.	-	-	2	-	-	-	-	-	-	-	-	-	2	-
		CO 4	Evaluate the shortest path by using different algorithms techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	2	2	2
24	Compiler Design	CO 1	To illustrate the theoretical concepts of finite state machine	2	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To analyze the grammars, parsing techniques, and actual code generation methods	-	3	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To Evaluate the different types of error and convert the code in I.C.G.	-	-	3	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To convert the optimized code into the machine code in the storage organisation and code optimization.	-	-	-	3	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	3	3	-	-	-	-	-	-	-	2.5	2	2
25	Operating System	CO 1	To demonstrate the knowledge of Operating System services including Memory, Device & File Management.	3	-	-	-	-	-	-	-	-	-	-	3	-	2
		CO 2	To categorize the Process management in terms of inter process communication and memory management methods for	-	3	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To Design the solution for scheduling and deadlock problems in operating system using appropriate algorithms such as round	-	-	2	-	-	-	-	-	-	-	-	3	-	2
		CO 4	To investigate LINUX/UNIX, OS, RTOS, windows and Mobile based OS file system through case study.	-	-	-	3	-	-	-	-	-	-	-	2	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	3	-	-	-	-	-	-	-	2.5	2	2
26	Computer Graphics & Multimedia	CO 1	Demonstrate the standards and Primitives of Drawing components like line, circle, ellipse, clipping, filling	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Analyze the graphics quality with the help 3D Graphics and Projections	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	Design the animation using transformation and clipping	-	-	3	-	-	-	-	-	-	-	-	-	-	2
		CO 4	Organize the primitives for Illumination, Shading and Color Models.(Evaluate)	-	-	-	2	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	2	2	2.5
27	Cyber Space	CO 1	Analyze and evaluate the cyber security needs of an organization.	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics	-	3	-	-	-	-	-	-	-	-	-	2	-	-

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46	ETHICAL HACKING AND DIGITAL FORENSICS	CO 2	Demonstrate a critical evaluation of an advanced security topic with an independent project.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	Analyze and critically evaluate techniques used to break into an insecure web application and identify relevant counter measures.	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		CO 4	Evaluate the potential counter measures to advanced hacking techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
46	Distributed System	CO 1	To generalize the basic elements and design architectures in distributed system.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze the concurrent processes, inter process communication and RPC and RMI case studies in	-	2	-	-	-	-	-	-	-	-	-	-	2	2	-
		CO 3	To study process scheduling, implementation and file systems along with corresponding case studies.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To analyze the memory sharing and failures, deadlock handling in distributed system architecture.	-	-	-	2	-	-	-	-	-	-	-	-	3	-	-
		CO 5	To analyse different agreements, faults and recoveries, management concept and CORBA services while implementing distributed system.	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
				3	2	2.5	2	-	-	-	-	-	-	-	-	2.5	2	-
47	Ecommerce and ERP	CO 1	To understand the CONCEPT OF Electronic Commerce, ERP and its applications	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To apply online publishing techniques in digital marketing	-	2	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	To compare E- Business models in web based applications for businesses	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
		CO 4	To evaluate XML and HTML for creating interactive pages for Web, e-business, and portable applications.	-	-	-	2	-	-	-	-	-	-	-	-	3	3	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	-	3	3	-
48	Digital Image Processing Lab	LO1	To implement the basic concept of Matlab programming tools for Digital Image processing	-	-	-	-	-	-	-	-	2	-	-	2	2	-	-
		LO2	To demonstrate and compare various image operations.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		LO3	To apply different type of filters and transform techniques on images.	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-
		LO4	To implement different morphological operations and segmentation on images.	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
		LO5	To prepare students for perform different enhancement technique on image.	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
				-	2	-	-	-	-	-	-	2	-	2	2	2	2	2

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53	Quality Management / ISO 9000 (Open Elective-1)	CO 2	To Analyse systematic methods in identifying where and how it might fail and relative impacts of different failures	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To formulate effectively customer requirements and convert them into detailed engineering	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	To Measure themselves against internal or external standards and to improve the capability of their business processes.	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
54	Cyber Security (Open Elective-1)	CO 1	To Apply basic concepts of Cybercrime and legal Perspectives of Security Implications for Organizations in respect to the	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To Analyze offences, attacks and Criminals plan for the cyber space.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To Compose the cyber security solutions and cyber security Tools in Cybercrime.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To Select the Management Perspective human role in security systems with an Organizational, emphasis on ethics, social	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	2	2	-	-	-	-	-	-	-	-	2	2	2
55	Internet of Things Lab	LO1	to Define the various terminal commands used in developing IOT applications.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	to develop the python scripts used in IOT applications.	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
		LO3	to apply the logics of IOT for designing IOT applications	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		LO4	to make a project to solve real time society based problem and demonstrate following PO related capabilities: a. improve team working skill	-	-	3	-	3	3	3	3	3	3	3	3	3	2	3
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	-	3	3	3	3	3	3	3	3	2.5	2.5	3
56	Cyber Security Lab	LO1	to analyse the data transferred and protocol using different security-based tools like Wire shark, tcpdump, packetkit, snort etc.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	2
		LO2	to design the substitution and transposition techniques for plain text encryption and decryption.	-	-	3	-	-	-	-	-	-	-	-	-	2	-	3
		LO3	to observe ARP Poisoning, encryption and decryption techniques for secure data transmission across network using smart and digital signatures	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
		LO4	to Install appropriate tools for network protocol analyze security-based tools like Wire shark, tcpdump etc.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	2
		LO5	to identify and describe a variety of ethical factors that may be relevant to understanding and assessing in cyber	-	-	-	-	-	-	-	3	-	-	-	-	2	3	-
		LO6	to improve team working skill for designing a solution for Key Exchange problem and general attacks on system	-	-	-	-	-	-	-	-	3	-	-	-	3	2	-
		LO7	to implement a smart project on server-client technology using a File Transfer Protocol mechanism and through socket programming and make report	-	-	-	-	-	-	2	-	-	3	3	3	-	2	3
				-	3	3	2	3	-	2	3	3	3	3	3	2.5	2.333	2.5

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				3	2	2	3	-	-	-	-	-	-	-	-	2	-	-
61	Big Data Analytics (Open Elective-II)	CO 1	To apply the fundamentals of Big Data analytics in Hadoop	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To analyze the input-output methods like writeable interface and serilization in Hadoop platform.	-	2	-	-	-	-	-	-	-	-	-	-	3	-	3
		CO 3	To design the Map Reduce programming models of big data analytics.	-	-	2	-	-	-	-	-	-	-	-	-	3	2	-
		CO 4	To evaluate of Pig and Hive architecture and their programing model such as HQL, Pig script.	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	-	3	2	3
62	Big Data Analytics Lab	LO1	To Understand Big Data and its analytics in the real world	3		-	-	-	-	-	-	-	-	-	-	3	-	-
		LO2	To Analyze the Big Data framework like Hadoop and NOSQL to efficiently	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
		LO3	To Implement Big Data Activities using Hive	-	-	-	-	-	-	-	-	-	-	-	3	-	3	-
				3	3	-	-	-	-	-	-	-	-	-	-	3	3	3
63	Software Testing and Validation Lab	LO1	To understand the process of manual testing or automation testing by writing test plan and test cases based on different	-	-	-	-	-	3	-	-	-	-	-	-	3	-	3
		LO2	To analyse the mutation score using various tools like jumble testing tool.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	-
		LO3	To analyse the performance of commercial websites using different automation tools like jmeter.	-	-	-	-	-	-	-	-	3	-	-	-	3	3	-
		LO4	To calculate the coverage analysis of programs using different automation tools like Ecllemma tool.	-	-	-	-	-	-	-	-	-	3	-	-	3	-	-
				-	-	-	-	3	3	-	-	3	3	-	-	3	3	3
64	Project	CO 1	Apply fundamental knowledge of basic Computer Engineering courses for solving complex Engineering problem	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	Analyze the literature, identify problem, its context with real world / industry issue and define problem statement	-	3	-	-	-	-	-	-	-	-	-	-	2	3	-
		CO 3	Design engineering solution to the problem using knowledge of core Computer engineering	-	-	3	-	-	-	-	-	-	-	-	-	3	3	-
		CO 4	Carryout experimentations/simulations and investigate the solution to complex Computer engineering problem	-	-	-	3	-	-	-	-	-	-	-	-	3	2	2
		CO 5	Use modern tools and techniques of Computer engineering for solving the problem	-	-	-	-	3	-	-	-	-	-	-	-	2	3	-
		CO 6	Analyse sustainability of proposed solution and its impact on environment & applicability of solution in industry and societal	-	-	-	-	-	3	3	-	-	-	-	-	3	-	3

		CO 6	Understand applicability of solution in industry and societal issues	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-
		CO 7	Analyse sustainability of proposed solution and its impact on environment	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO 8	Understand professional ethics, rules and regulations while working on interdisciplinary issues	-	-	-	-	-	-	-	2	-	-	-	-	-	3	-
				2	3	3	3	2	2	2	2	-	-	-	-	2.667	2.667	3
69	Composite Materials	CO 1	Explain the basics of composites, its structure and its properties	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	Compute the physio-mechanical properties of composites from tests	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 3	Assessment of engineering properties of composite materials	1	2	1	-	-	-	-	-	-	-	-	-	-	-	1
		CO 4	Analyze the failure and maintenance of composite materials	1	-	1	1	1	-	-	-	-	-	-	-	1	-	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	-	-	-	-	-	-	-	1	-	1
70	Fire and Safety Engineering	CO 1	Explain the fundamentals of Fire Engineering	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-
		CO 2	Apply the learned principles in planning, designing and management of fire safe buildings	2	1	1	-	1	1	-	-	-	-	1	-	1	1	-
		CO 3	Assess fire fighting installations, control technologies and hazardous materials	1	2	1	-	1	1	-	-	-	-	-	-	1	1	1
		CO 4	Design of fire safety building for fire resistant construction by following safety legislation	1	-	1	1	1	1	-	1	-	-	-	-	-	1	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	1	-	1	-	-	1	-	1	1	1
71	Industrial and Biomedical applications of RF Energy	CO 1	Understanding of basic concepts and Principles of EM wave, propagation reflection and transmission. [Understanding]	3	2	-	-	-	-	-	-	3	-	-	-	-	1	-
		CO 2	Apply the knowledge for interest in complex dielectric constant, dipolar loss mechanism and design mechanism to understand	3	2	-	-	-	-	-	-	3	-	-	-	1	-	-
		CO 3	Analyze the structure of RF heating in industrial application. [Analyzing]	3	2	3	-	-	-	-	-	3	-	-	-	-	1	-
		CO 4	Design of Hazards and safety standards in various engineering problem. [Create & Design].	3	3	3	3	-	-	-	-	3	-	-	-	-	1	-
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2.25	3	3	-	-	-	-	3	-	-	-	1	1	-
72	Robotics and	CO 1	Understand the fundamentals of robotics and its components, methods of linear motion into rotary motion and vice-versa.	3	3	2	2	2	3	3	3	2	-	3	3	2	-	-
		CO 2	Apply the appropriate techniques for movement of robotic joints with computers/microcontrollers. [Applying &	3	2	2	2	-	3	2	-	3	2	3	3	2	-	-
		CO 3	Analyze parameters required to be controlled in a Robot for specific application. [Analyzing]	3	2	3	3	3	3	-	-	2	2	2	3	2	-	-

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Department of Computer Engineering

B.Tech. in Computer Engineering

CO-PO Mapping (Session 2023-24)

S.No	Course Name	CO No	Course Outcomes (After completing the course students will be able to.....)	PO 1: Engine er knowl	PO 2: Probl em analys	PO 3: Desig n/deve lopme	PO 4: Condu ct investi	PO 5: Mode rn tool	PO 6: The engine er and	PO 7: Envir onment and	PO 8: Ethics : Apply	PO 9: Indivi dual and	PO 10: Com munic	PO 11: Proje ct	PO 12: Life- long	PSO1- The ability to	PSO2- The ability to	PSO3- The ability to
1	Engineering Mathematics-I	CO1	Students will be able to define and explain basic concepts definite integrals, sequence and series, periodic functions and multivariable functions.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will be able to understand properties of beta and gamma function, convergence of sequence and series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	The students will be able to apply properties of beta and gamma functions and definite integrals to find surface area and volumes of revolution. They will be able to apply partial derivatives and multiple integrals to solve many problems in science and engineering.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Students will be able to analyse Fourier series to make many useful deductions which lay down foundation of signal processing and image processing.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Engineering Chemistry	CO1	Describe characteristics of water, fuel and Engineering materials-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Determine of hardness of water and calorific value of fuels for Industrial as well as domestic purposes	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Compare different techniques of water treatment, fuel analysis, Manufacturing of engineering materials and corrosion protection methods	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Prepare the generic drugs or medicines by identifying the applications of organic reaction mechanism and manufacturing of engineering materials	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	1	2
3	Communication Skills	CO1	Describe the process of communication, basics of Grammar and Writing and Literary Aspects	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Explain the types of communication, barriers and channels of communication and the concept of Literature through Short Stories and poetry		-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Write and prepare professional reports, paragraph and business letters with the correct use of grammar	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
		CO4	Discuss and illustrate the impact of social and moral values by implying the basics of English Writing Skills through literary aspects	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-

		CO5	Restate and outline the basic areas of English Language Skills with the applications of literature	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
				-	-	-	-	-	-	-	2	-	2	-	2	-	-	-
4	Basic Mechanical Engineering	CO1	Students will be able to retrieve basic concepts of thermal and manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will able to compare different types of thermal and manufacturing processes and.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Students will able to annotating about the functioning of turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing process.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Student will be able to appraise the fundamental knowledge of thermal engineering, in addition to understanding of power transmission to solve the industrial and societal issues.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Basic Electrical Engineering	CO1	Identify basic components of electrical engineering and connect them to form different circuits to verify basic laws.Understanding	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Analyse the output of rectifier circuit,AC and DC machines to solve problems associated with Basic electrical engineering.Analyse	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
		CO3	Contribute efficiently in a team to acieve desired response of AC and DC Machines. Team Work	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		CO4	Demonstrate the output of rectifier circuits consistiong of basic components of electrical engineering. Mechanism	-	-	-	-	-	-	-	-	-	-	3	-	2	-	-
				2.5	3	-	-	-	-	-	-	3	-	3	-	1.5	-	-
6	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO3	Analyze different characteristics of water and fuel to solve societal and enviornmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO4	Students will show an ability to work as a team member ethically	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-
				1	-	-	-	-	-	-	2	2	2.5	-	-	-	-	-
7	Language Lab	CO1	Use and pronounce the words correctly.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Acquire knowledge of the correct expressions,vocabulary etc. in personal and professional lives.	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Plan successfully for leadership and teamwork,crack GD's, interviews and other professional activities.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO4	Synthesize the process of communication using LSRW.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
				-	-	-	-	-	-	-	-	2	2	-	-	-	-	-

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				1.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Human Values	CO1	Relate sustained happiness through identifying the essentials of human values and skills	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
		CO2	Find the happiness and human values in terms of personal and social life to create harmony in them	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
		CO3	Use and understand practically the importance of trust, mutually satisfaction and human relationship	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
		CO4	Identify the orders of nature for the holistic perception of harmony for human existence	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO5	Implement professional ethics and natural acceptance of human values in his/her life	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
				-	-	-	-	-	2	-	2.5	-	-	-	2	-	-	-
14	Programming for Problem Solving	CO1	Understand the basic concepts of fundamental of computer system, number system and programming. (Remembering)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain various memory units, representation of number system and Conditional, Iterative statements using arrays, string, pointers, file structure. (Understanding)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Examine the concept of algorithms, flowchart, Operators, Pointer, Array, String, structure, union using modularization to illustrate the User Defined functions, Memory management and File concepts to solve real time problems using C Programming (Analyzing)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	File concepts to solve real time problems using C Programming (Analyzing)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Basic Civil Engineering	CO1	Describe Scope, role and Specialization of Civil Engineering, basics of surveying, types of building, Plinth area, carpet area, floor space index, R.C.C., mode of transportation and different causes of pollution. (Remember)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain solid waste management, building by-laws, concept of sun light and ventilation, chemical and hydrological cycle, biodiversity, causes of road accident, sanitary landfill and on-site sanitation, food chain and food web, contour maps, Global warming, Climate Change, Ozone depletion, and Green House effect. (Understand)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Illustrate method of ranging and levelling, road safety measures, building component, environmental acts, different types of foundation, treatment and disposal of waste water, traffic sign and symbol and rain water harvesting. (Apply)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Compute errors in linear measurement, bearings and elevations of respective points on the ground. (Analyze)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO1	Operate the various devices for the multifarious use in the relative fields.	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-

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		CO4	Understand and Analyze transaction processing and concurrency control concepts.	--	-	2	-	-	-	-	-	-	-	-	-	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	2	-	-	-	-	-	-	-	-	2	2.5	-
16	Theory of Computation	CO 1	To demonstrate basic concepts of computation	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze language expressions and Grammars in finite automata.	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To design the solutions of computation problem using suitable machines	-	-	2	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To apply the concepts of Computation in real life problems .	-	-	-	2	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	2	-	-	-	-	-	-	-	2	2	2.5
17	Data Communication and Computer Networks	CO1	To explain networking models and data trasmission	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO2	Apply the the Error Detection and Correction techniques.	2	-	-	-	-	-	-	-	-	-	-	2	-	2
		CO3	To analyze the network Layer routing algorithms.	-	2	-	-	-	-	-	-	-	-	-	2	-	2
		CO4	examine the transport and application layers protocol service	-	2	-	-	-	-	-	-	-	-	-	2	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	2	-	2
18	Microprocessor & Interfaces Lab	LO1	To familriaze with the architecture and instruction set of Intel 8085	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	To demonstrate operation of typical 8085 microprocessor trainer kit	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	To provide practical hands on experience with Assembly Language Programming	-	-	-	-	-	-	-	-	-	2	-	-	-	2
		LO4	To analyze limitations and applications of Assembly language Programming for the real world problem	-	-	-	-	-	-	-	-	-	-	2	-	-	2
		LO5	To get familiarize with interfacing of various peripheral devices using 8085 chip	-	-	1	-	-	-	-	-	-	-	-	2	-	-
				2	2	1	-	-	-	-	-	-	2	2	2	-	2
		LO1	Select appropriate technique to design database and schemas for a given application using DDL/DML SQL commands	-	-	2	-	2	-	-	-	-	-	1	2	-	-
		LO2	Apply the concept of integrity Rules and Constraints to ensure accurate and error free data	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	Identify solutions for database update using pre store Procedures and Triggers	-	-	2	-	-	-	-	-	-	-	2	-	-	-

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46	ETHICAL HACKING AND DIGITAL FORENSICS	CO 2	Demonstrate a critical evaluation of an advanced security topic with an independent project.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	Analyze and critically evaluate techniques used to break into an insecure web application and identify relevant counter measures.	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		CO 4	Evaluate the potential counter measures to advanced hacking techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
46	Distributed System	CO 1	To generalize the basic elements and design architectures in distributed system.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze the concurrent processes, inter process communication and RPC and RMI case studies in	-	2	-	-	-	-	-	-	-	-	-	-	2	2	-
		CO 3	To study process scheduling, implementation and file systems along with corresponding case studies.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To analyze the memory sharing and failures, deadlock handling in distributed system architecture.	-	-	-	2	-	-	-	-	-	-	-	-	3	-	-
		CO 5	To analyse different agreements, faults and recoveries, management concept and CORBA services while implementing distributed system.	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
				3	2	2.5	2	-	-	-	-	-	-	-	-	2.5	2	-
47	Ecommerce and ERP	CO 1	To understand the CONCEPT OF Electronic Commerce, ERP and its applications	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To apply online publishing techniques in digital marketing	-	2	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	To compare E- Business models in web based applications for businesses	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
		CO 4	To evaluate XML and HTML for creating interactive pages for Web, e-business, and portable applications.	-	-	-	2	-	-	-	-	-	-	-	-	3	3	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	-	3	3	-
48	Digital Image Processing Lab	LO1	To implement the basic concept of Matlab programming tools for Digital Image processing	-	-	-	-	-	-	-	-	2	-	-	2	2	-	-
		LO2	To demonstrate and compare various image operations.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		LO3	To apply different type of filters and transform techniques on images.	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-
		LO4	To implement different morphological operations and segmentation on images.	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
		LO5	To prepare students for perform different enhancement technique on image.	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
				-	2	-	-	-	-	-	-	2	-	2	2	2	2	2

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53	Quality Management / ISO 9000 (Open Elective-1)	CO 2	To Analyse systematic methods in identifying where and how it might fail and relative impacts of different failures	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To formulate effectively customer requirements and convert them into detailed engineering	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	To Measure themselves against internal or external standards and to improve the capability of their business processes.	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
54	Cyber Security (Open Elective-1)	CO 1	To Apply basic concepts of Cybercrime and legal Perspectives of Security Implications for Organizations in respect to the	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To Analyze offences, attacks and Criminals plan for the cyber space.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To Compose the cyber security solutions and cyber security Tools in Cybercrime.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To Select the Management Perspective human role in security systems with an Organizational, emphasis on ethics, social	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	2	2	-	-	-	-	-	-	-	-	2	2	2
55	Internet of Things Lab	LO1	to Define the various terminal commands used in developing IOT applications.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	to develop the python scripts used in IOT applications.	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
		LO3	to apply the logics of IOT for designing IOT applications	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		LO4	to make a project to solve real time society based problem and demonstrate following PO related capabilities: a. improve team working skill	-	-	3	-	3	3	3	3	3	3	3	3	3	2	3
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	-	3	3	3	3	3	3	3	3	2.5	2.5	3
56	Cyber Security Lab	LO1	to analyse the data transferred and protocol using different security-based tools like Wire shark, tcpdump, packetkit, snort etc.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	2
		LO2	to design the substitution and transposition techniques for plain text encryption and decryption.	-	-	3	-	-	-	-	-	-	-	-	-	2	-	3
		LO3	to observe ARP Poisoning, encryption and decryption techniques for secure data transmission across network using smart and digital signatures	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
		LO4	to Install appropriate tools for network protocol analyze security-based tools like Wire shark, tcpdump etc.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	2
		LO5	to identify and describe a variety of ethical factors that may be relevant to understanding and assessing in cyber	-	-	-	-	-	-	-	3	-	-	-	-	2	3	-
		LO6	to improve team working skill for designing a solution for Key Exchange problem and general attacks on system	-	-	-	-	-	-	-	-	3	-	-	-	3	2	-
		LO7	to implement a smart project for server-client technology using a File Transfer Protocol mechanism and through socket programming and make report	-	-	-	-	-	-	2	-	-	3	3	3	-	2	3
				-	3	3	2	3	-	2	3	3	3	3	3	2.5	2.333	2.5

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				3	2	2	3	-	-	-	-	-	-	-	-	2	-	-
61	Big Data Analytics (Open Elective-II)	CO 1	To apply the fundamentals of Big Data analytics in Hadoop	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To analyze the input-output methods like writeable interface and serilization in Hadoop platform.	-	2	-	-	-	-	-	-	-	-	-	-	3	-	3
		CO 3	To design the Map Reduce programming models of big data analytics.	-	-	2	-	-	-	-	-	-	-	-	-	3	2	-
		CO 4	To evaluate of Pig and Hive architecture and their programming model such as HQL, Pig script.	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	-	3	2	3
62	Big Data Analytics Lab	LO1	To Understand Big Data and its analytics in the real world	3		-	-	-	-	-	-	-	-	-	3	-	-	
		LO2	To Analyze the Big Data framework like Hadoop and NOSQL to efficiently	-	3	-	-	-	-	-	-	-	-	-	3	-	-	
		LO3	To Implement Big Data Activities using Hive	-	-	-	-	-	-	-	-	-	-	3	-	3	-	
				3	3	-	-	-	-	-	-	-	-	-	3	3	3	-
63	Software Testing and Validation Lab	LO1	To understand the process of manual testing or automation testing by writing test plan and test cases based on different	-	-	-	-	-	3	-	-	-	-	-	3	-	3	-
		LO2	To analyse the mutation score using various tools like jumble testing tool.	-	-	-	-	3	-	-	-	-	-	-	3	-	-	-
		LO3	To analyse the performance of commercial websites using different automation tools like jmeter.	-	-	-	-	-	-	-	-	3	-	-	3	3	-	-
		LO4	To calculate the coverage analysis of programs using different automation tools like Ecllemma tool.	-	-	-	-	-	-	-	-	-	3	-	3	-	-	-
				-	-	-	-	3	3	-	-	3	3	-	3	3	3	-
64	Project	CO 1	Apply fundamental knowledge of basic Computer Engineering courses for solving complex Engineering problem	3	-	-	-	-	-	-	-	-	-	-	3	-	-	
		CO 2	Analyze the literature, identify problem, its context with real world / industry issue and define problem statement	-	3	-	-	-	-	-	-	-	-	-	2	3	-	
		CO 3	Design engineering solution to the problem using knowledge of core Computer engineering	-	-	3	-	-	-	-	-	-	-	-	3	3	-	
		CO 4	Carryout experimentations/simulations and investigate the solution to complex Computer engineering problem	-	-	-	3	-	-	-	-	-	-	-	3	2	2	3
		CO 5	Use modern tools and techniques of Computer engineering for solving the problem	-	-	-	-	3	-	-	-	-	-	-	2	3	-	
		CO 6	Analyse sustainability of proposed solution and its impact on environment & applicability of solution in industry and societal	-	-	-	-	-	3	3	-	-	-	-	-	3	-	3

		CO 6	Understand applicability of solution in industry and societal issues	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-
		CO 7	Analyse sustainability of proposed solution and its impact on environment	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO 8	Understand professional ethics, rules and regulations while working on interdisciplinary issues	-	-	-	-	-	-	-	2	-	-	-	-	-	3	-
				2	3	3	3	2	2	2	2	-	-	-	-	2.667	2.667	3
69	Composite Materials	CO 1	Explain the basics of composites, its structure and its properties	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	Compute the physio-mechanical properties of composites from tests	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 3	Assessment of engineering properties of composite materials	1	2	1	-	-	-	-	-	-	-	-	-	-	-	1
		CO 4	Analyze the failure and maintenance of composite materials	1	-	1	1	1	-	-	-	-	-	-	-	1	-	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	-	-	-	-	-	-	-	1	-	1
70	Fire and Safety Engineering	CO 1	Explain the fundamentals of Fire Engineering	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-
		CO 2	Apply the learned principles in planning, designing and management of fire safe buildings	2	1	1	-	1	1	-	-	-	-	1	-	1	1	-
		CO 3	Assess fire fighting installations, control technologies and hazardous materials	1	2	1	-	1	1	-	-	-	-	-	-	1	1	1
		CO 4	Design of fire safety building for fire resistant construction by following safety legislation	1	-	1	1	1	1	-	1	-	-	-	-	-	1	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	1	-	1	-	-	1	-	1	1	1
71	Industrial and Biomedical applications of RF Energy	CO 1	Understanding of basic concepts and Principles of EM wave, propagation reflection and transmission. [Understanding]	3	2	-	-	-	-	-	-	3	-	-	-	-	1	-
		CO 2	Apply the knowledge for interest in complex dielectric constant, dipolar loss mechanism and design mechanism to understand	3	2	-	-	-	-	-	-	3	-	-	-	1	-	-
		CO 3	Analyze the structure of RF heating in industrial application. [Analyzing]	3	2	3	-	-	-	-	-	3	-	-	-	-	1	-
		CO 4	Design of Hazards and safety standards in various engineering problem. [Create & Design].	3	3	3	3	-	-	-	-	3	-	-	-	-	1	-
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2.25	3	3	-	-	-	-	3	-	-	-	1	1	-
72	Robotics and	CO 1	Understand the fundamentals of robotics and its components, methods of linear motion into rotary motion and vice-versa.	3	3	2	2	2	3	3	3	2	-	3	3	2	-	-
		CO 2	Apply the appropriate techniques for movement of robotic joints with computers/microcontrollers. [Applying &	3	2	2	2	-	3	2	-	3	2	3	3	2	-	-
		CO 3	Analyze parameters required to be controlled in a Robot for specific application. [Analyzing]	3	2	3	3	3	3	-	-	2	2	2	3	2	-	-

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Department of Computer Engineering																		
B.Tech. in Computer Engineering-Regional Course																		
CO-PO Mapping (Session 2023-24)																		
S.No	Course Name	CO No	Course Outcomes (After completing the course students will be able to.....)	PO 1: Engine ing knowl	PO 2: Probl em analys	PO 3: Desig n/deve lopme	PO 4: Condu ct investi	PO 5: Mode rn tool	PO 6: The engine er and	PO 7: Envir onme nt and	PO 8: Ethics : Apply	PO 9: Indivi dual and	PO 10: Com munic	PO 11: Proje ct	PO 12: Life- long	PSO1- The ability to	PSO2- The ability to	PSO3- The ability to
1	Engineering Mathematics-I	CO1	Students will be able to define and explain basic concepts definite integrals, sequence and series, periodic functions and multivariable functions.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will be able to understand properties of beta and gamma function, convergence of sequence and series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	The students will be able to apply properties of beta and gamma functions and definite integrals to find surface area and volumes of revolution. They will be able to apply partial derivatives and multiple integrals to solve many problems in science and engineering.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Students will be able to analyse Fourier series to make many useful deductions which lay down foundation of signal processing and image processing.	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Engineering Chemistry	CO1	Describe characteristics of water, fuel and Engineering materials-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
		CO2	Determine of hardness of water and calorific value of fuels for Industrial as well as domestic purposes	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CO3	Compare different techniques of water treatment, fuel analysis, Manufacturing of engineering materials and corrosion protection methods	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Prepare the generic drugs or medicines by identifying the applications of organic reaction mechanism and manufacturing of engineering materials	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	1	2
3	Communication Skills	CO1	Describe the process of communication, basics of Grammar and Writing and Literary Aspects	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Explain the types of communication, barriers and channels of communication and the concept of Literature through Short Stories and poetry		-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Write and prepare professional reports, paragraph and business letters with the correct use of grammar	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
		CO4	Discuss and illustrate the impact of social and moral values by implying the basics of English Writing Skills through literary aspects	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-

		CO5	Restate and outline the basic areas of English Language Skills with the applications of literature	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
				-	-	-	-	-	-	-	2	-	2	-	2	-	-	-
4	Basic Mechanical Engineering	CO1	Students will be able to retrieve basic concepts of thermal and manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Students will able to compare different types of thermal and manufacturing processes and.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Students will able to annotating about the functioning of turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing process.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Student will be able to appraise the fundamental knowledge of thermal engineering, in addition to understanding of power transmission to solve the industrial and societal issues.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Basic Electrical Engineering	CO1	Identify basic components of electrical engineering and connect them to form different circuits to verify basic laws.Understanding	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Analyse the output of rectifier circuit,AC and DC machines to solve problems associated with Basic electrical engineering.Analyse	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
		CO3	Contribute efficiently in a team to acieve desired response of AC and DC Machines. Team Work	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		CO4	Demonstrate the output of rectifier circuits consistiong of basic components of electrical engineering. Mechanism	-	-	-	-	-	-	-	-	-	-	3	-	2	-	-
				2.5	3	-	-	-	-	-	-	3	-	3	-	1.5	-	-
6	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO3	Analyze different characteristics of water and fuel to solve societal and enviornmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO4	Students will show an ability to work as a team member ethically	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-
				1	-	-	-	-	-	-	2	2	2.5	-	-	-	-	-
7	Language Lab	CO1	Use and pronounce the words correctly.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
		CO2	Acquire knowledge of the correct expressions,vocabulary etc. in personal and professional lives.	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
		CO3	Plan successfully for leadership and teamwork,crack GD's, interviews and other professional activities.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
		CO4	Synthesize the process of communication using LSRW.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
				-	-	-	-	-	-	-	-	2	2	-	-	-	-	-

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				1.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Human Values	CO1	Relate sustained happiness through identifying the essentials of human values and skills	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
		CO2	Find the happiness and human values in terms of personal and social life to create harmony in them	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
		CO3	Use and understand practically the importance of trust, mutually satisfaction and human relationship	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
		CO4	Identify the orders of nature for the holistic perception of harmony for human existence	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO5	Implement professional ethics and natural acceptance of human values in his/her life	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
				-	-	-	-	-	2	-	2.5	-	-	-	2	-	-	-
14	Programming for Problem Solving	CO1	Understand the basic concepts of fundamental of computer system, number system and programming. (Remembering)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain various memory units, representation of number system and Conditional, Iterative statements using arrays, string, pointers, file structure. (Understanding)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Examine the concept of algorithms, flowchart, Operators, Pointer, Array, String, structure, union using modularization to illustrate the User Defined functions, Memory management and File concepts to solve real time problems using C Programming (Analyzing)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	File concepts to solve real time problems using C Programming (Analyzing)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Basic Civil Engineering	CO1	Describe Scope, role and Specialization of Civil Engineering, basics of surveying, types of building, Plinth area, carpet area, floor space index, R.C.C., mode of transportation and different causes of pollution. (Remember)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO2	Explain solid waste management, building by-laws, concept of sun light and ventilation, chemical and hydrological cycle, biodiversity, causes of road accident, sanitary landfill and on-site sanitation, food chain and food web, contour maps, Global warming, Climate Change, Ozone depletion, and Green House effect. (Understand)	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Illustrate method of ranging and levelling, road safety measures, building component, environmental acts, different types of foundation, treatment and disposal of waste water, traffic sign and symbol and rain water harvesting. (Apply)	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Compute errors in linear measurement, bearings and elevations of respective points on the ground. (Analyze)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO1	Operate the various devices for the multifarious use in the relative fields.	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-

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		CO4	Understand and Analyze transaction processing and concurrency control concepts.	--	-	2	-	-	-	-	-	-	-	-	-	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	1	2	-	-	-	-	-	-	-	-	2	2.5	-
16	Theory of Computation	CO 1	To demonstrate basic concepts of computation	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze language expressions and Grammars in finite automata.	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To design the solutions of computation problem using suitable machines	-	-	2	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To apply the concepts of Computation in real life problems .	-	-	-	2	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	2	-	-	-	-	-	-	-	2	2	2.5
17	Data Communication and Computer Networks	CO1	To explain networking models and data trasmission	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO2	Apply the the Error Detection and Correction techniques.	2	-	-	-	-	-	-	-	-	-	-	2	-	2
		CO3	To analyze the network Layer routing algorithms.	-	2	-	-	-	-	-	-	-	-	-	2	-	2
		CO4	examine the transport and application layers protocol service	-	2	-	-	-	-	-	-	-	-	-	2	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	-	-	-	-	-	-	-	-	-	2	-	2
18	Microprocessor & Interfaces Lab	LO1	To familriaze with the architecture and instruction set of Intel 8085	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	To demonstrate operation of typical 8085 microprocessor trainer kit	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	To provide practical hands on experience with Assembly Language Programming	-	-	-	-	-	-	-	-	-	2	-	-	-	2
		LO4	To analyze limitations and applications of Assembly language Programming for the real world problem	-	-	-	-	-	-	-	-	-	-	2	-	-	2
		LO5	To get familiarize with interfacing of various peripheral devices using 8085 chip	-	-	1	-	-	-	-	-	-	-	-	2	-	-
				2	2	1	-	-	-	-	-	-	2	2	2	-	2
		LO1	Select appropriate technique to design database and schemas for a given application using DDL/DML SQL commands	-	-	2	-	2	-	-	-	-	-	1	2	-	-
		LO2	Apply the concept of integrity Rules and Constraints to ensure accurate and error free data	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO3	Identify solutions for database update using pre store Procedures and Triggers	-	-	2	-	-	-	-	-	-	-	2	-	-	-

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23	Information Theory & Coding	CO 3	Design the linear block code and cyclic code for error free communication.	-	-	2	-		-	-	-	-	-	-	-	2	-
		CO 4	Evaluate the shortest path by using different algorithms techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	2	2	2
24	Compiler Design	CO 1	To illustrate the theoretical concepts of finite state machine	2	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To analyze the grammars, parsing techniques, and actual code generation methods	-	3	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To Evaluate the different types of error and convert the code in I.C.G.	-	-	3	-	-	-	-	-	-	-	-	-	-	2
		CO 4	To convert the optimized code into the machine code in the storage organisation and code optimization.	-	-	-	3	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	3	3	-	-	-	-	-	-	-	2.5	2	2
25	Operating System	CO 1	To demonstrate the knowledge of Operating System services including Memory, Device & File Management.	3	-	-	-	-	-	-	-	-	-	-	3	-	2
		CO 2	To categorize the Process management in terms of inter process communication and memory management methods for	-	3	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To Design the solution for scheduling and deadlock problems in operating system using appropriate algorithms such as round	-	-	2	-	-	-	-	-	-	-	-	3	-	2
		CO 4	To investigate LINUX/UNIX, OS, RTOS, windows and Mobile based OS file system through case study.	-	-	-	3	-	-	-	-	-	-	-	2	2	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	3	-	-	-	-	-	-	-	2.5	2	2
26	Computer Graphics & Multimedia	CO 1	Demonstrate the standards and Primitives of Drawing components like line, circle, ellipse, clipping, filling	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Analyze the graphics quality with the help 3D Graphics and Projections	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	Design the animation using transformation and clipping	-	-	3	-	-	-	-	-	-	-	-	-	-	2
		CO 4	Organize the primitives for Illumination, Shading and Color Models.(Evaluate)	-	-	-	2	-	-	-	-	-	-	-	-	-	3
				-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	2	2	2.5
27	Cyber Space	CO 1	Analyze and evaluate the cyber security needs of an organization.	2	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics	-	3	-	-	-	-	-	-	-	-	-	2	-	-

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46	ETHICAL HACKING AND DIGITAL FORENSICS	CO 2	Demonstrate a critical evaluation of an advanced security topic with an independent project.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	Analyze and critically evaluate techniques used to break into an insecure web application and identify relevant counter measures.	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		CO 4	Evaluate the potential counter measures to advanced hacking techniques.	-	-	-	3	-	-	-	-	-	-	-	-	-	-	3
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
46	Distributed System	CO 1	To generalize the basic elements and design architectures in distributed system.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To analyze the concurrent processes, inter process communication and RPC and RMI case studies in	-	2	-	-	-	-	-	-	-	-	-	-	2	2	-
		CO 3	To study process scheduling, implementation and file systems along with corresponding case studies.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To analyze the memory sharing and failures, deadlock handling in distributed system architecture.	-	-	-	2	-	-	-	-	-	-	-	-	3	-	-
		CO 5	To analyse different agreements, faults and recoveries, management concept and CORBA services while implementing distributed system.	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
				3	2	2.5	2	-	-	-	-	-	-	-	-	2.5	2	-
47	Ecommerce and ERP	CO 1	To understand the CONCEPT OF Electronic Commerce, ERP and its applications	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To apply online publishing techniques in digital marketing	-	2	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 3	To compare E- Business models in web based applications for businesses	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
		CO 4	To evaluate XML and HTML for creating interactive pages for Web, e-business, and portable applications.	-	-	-	2	-	-	-	-	-	-	-	-	3	3	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	3	2	-	-	-	-	-	-	-	-	3	3	-
48	Digital Image Processing Lab	LO1	To implement the basic concept of Matlab programming tools for Digital Image processing	-	-	-	-	-	-	-	-	2	-	-	2	2	-	-
		LO2	To demonstrate and compare various image operations.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-
		LO3	To apply different type of filters and transform techniques on images.	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-
		LO4	To implement different morphological operations and segmentation on images.	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
		LO5	To prepare students for perform different enhancement technique on image.	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-
				-	2	-	-	-	-	-	-	2	-	2	2	2	2	2

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53	Quality Management / ISO 9000 (Open Elective-1)	CO 2	To Analyse systematic methods in identifying where and how it might fail and relative impacts of different failures	-	3	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 3	To formulate effectively customer requirements and convert them into detailed engineering	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
		CO 4	To Measure themselves against internal or external standards and to improve the capability of their business processes.	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	2	2	-	-	-	-	-	-	-	-	2	-	-
54	Cyber Security (Open Elective-1)	CO 1	To Apply basic concepts of Cybercrime and legal Perspectives of Security Implications for Organizations in respect to the	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		CO 2	To Analyze offences, attacks and Criminals plan for the cyber space.	-	3	-	-	-	-	-	-	-	-	-	-	-	2	-
		CO 3	To Compose the cyber security solutions and cyber security Tools in Cybercrime.	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
		CO 4	To Select the Management Perspective human role in security systems with an Organizational, emphasis on ethics, social	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	3	2	2	-	-	-	-	-	-	-	-	2	2	2
55	Internet of Things Lab	LO1	to Define the various terminal commands used in developing IOT applications.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		LO2	to develop the python scripts used in IOT applications.	-	3	-	-	-	-	-	-	-	-	-	-	-	-	3
		LO3	to apply the logics of IOT for designing IOT applications	-	-	3	-	-	-	-	-	-	-	-	-	-	3	-
		LO4	to make a project to solve real time society based problem and demonstrate following PO related capabilities: a. improve team working skill	-	-	3	-	3	3	3	3	3	3	3	3	3	2	3
		LO5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	3	3	-	3	3	3	3	3	3	3	3	2.5	2.5	3
56	Cyber Security Lab	LO1	to analyse the data transferred and protocol using different security-based tools like Wire shark, tcpdump, packetkit, snort etc.	-	3	-	-	-	-	-	-	-	-	-	-	3	-	2
		LO2	to design the substitution and transposition techniques for plain text encryption and decryption.	-	-	3	-	-	-	-	-	-	-	-	-	2	-	3
		LO3	to observe ARP Poisoning, encryption and decryption techniques for secure data transmission across network using smart and digital signatures	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-
		LO4	to Install appropriate tools for network protocol analyze security-based tools like Wire shark, tcpdump etc.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	2
		LO5	to identify and describe a variety of ethical factors that may be relevant to understanding and assessing in cyber	-	-	-	-	-	-	-	3	-	-	-	-	2	3	-
		LO6	to improve team working skill for designing a solution for Key Exchange problem and general attacks on system	-	-	-	-	-	-	-	-	3	-	-	-	3	2	-
		LO7	to implement a smart project or server-client technology using a File Transfer Protocol mechanism and through socket programming and make report	-	-	-	-	-	-	2	-	-	3	3	3	-	2	3
				-	3	3	2	3	-	2	3	3	3	3	3	2.5	2.333	2.5

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				3	2	2	3	-	-	-	-	-	-	-	-	2	-	-
61	Big Data Analytics (Open Elective-II)	CO 1	To apply the fundamentals of Big Data analytics in Hadoop	2	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	To analyze the input-output methods like writeable interface and serilization in Hadoop platform.	-	2	-	-	-	-	-	-	-	-	-	-	3	-	3
		CO 3	To design the Map Reduce programming models of big data analytics.	-	-	2	-	-	-	-	-	-	-	-	-	3	2	-
		CO 4	To evaluate of Pig and Hive architecture and their programing model such as HQL, Pig script.	-	-	-	3	-	-	-	-	-	-	-	-	3	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				2	2	2	3	-	-	-	-	-	-	-	-	3	2	3
62	Big Data Analytics Lab	LO1	To Understand Big Data and its analytics in the real world	3		-	-	-	-	-	-	-	-	-	-	3	-	-
		LO2	To Analyze the Big Data framework like Hadoop and NOSQL to efficiently	-	3	-	-	-	-	-	-	-	-	-	-	3	-	-
		LO3	To Implement Big Data Activities using Hive	-	-	-	-	-	-	-	-	-	-	-	3	-	3	-
				3	3	-	-	-	-	-	-	-	-	-	-	3	3	3
63	Software Testing and Validation Lab	LO1	To understand the process of manual testing or automation testing by writing test plan and test cases based on different	-	-	-	-	-	3	-	-	-	-	-	-	3	-	3
		LO2	To analyse the mutation score using various tools like jumble testing tool.	-	-	-	-	3	-	-	-	-	-	-	-	3	-	-
		LO3	To analyse the performance of commercial websites using different automation tools like jmeter.	-	-	-	-	-	-	-	-	3	-	-	-	3	3	-
		LO4	To calculate the coverage analysis of programs using different automation tools like Ecllemma tool.	-	-	-	-	-	-	-	-	-	3	-	-	3	-	-
				-	-	-	-	3	3	-	-	3	3	-	-	3	3	3
64	Project	CO 1	Apply fundamental knowledge of basic Computer Engineering courses for solving complex Engineering problem	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-
		CO 2	Analyze the literature, identify problem, its context with real world / industry issue and define problem statement	-	3	-	-	-	-	-	-	-	-	-	-	2	3	-
		CO 3	Design engineering solution to the problem using knowledge of core Computer engineering	-	-	3	-	-	-	-	-	-	-	-	-	3	3	-
		CO 4	Carryout experimentations/simulations and investigate the solution to complex Computer engineering problem	-	-	-	3	-	-	-	-	-	-	-	-	3	2	2
		CO 5	Use modern tools and techniques of Computer engineering for solving the problem	-	-	-	-	3	-	-	-	-	-	-	-	2	3	-
		CO 6	Analyse sustainability of proposed solution and its impact on environment & applicability of solution in industry and societal	-	-	-	-	-	3	3	-	-	-	-	-	3	-	3

		CO 6	Understand applicability of solution in industry and societal issues	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-
		CO 7	Analyse sustainability of proposed solution and its impact on environment	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
		CO 8	Understand professional ethics, rules and regulations while working on interdisciplinary issues	-	-	-	-	-	-	-	2	-	-	-	-	-	3	-
				2	3	3	3	2	2	2	2	-	-	-	-	2.667	2.667	3
69	Composite Materials	CO 1	Explain the basics of composites, its structure and its properties	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO 2	Compute the physio-mechanical properties of composites from tests	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1
		CO 3	Assessment of engineering properties of composite materials	1	2	1	-	-	-	-	-	-	-	-	-	-	-	1
		CO 4	Analyze the failure and maintenance of composite materials	1	-	1	1	1	-	-	-	-	-	-	-	1	-	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	-	-	-	-	-	-	-	1	-	1
70	Fire and Safety Engineering	CO 1	Explain the fundamentals of Fire Engineering	2	-	-	-	-	1	-	-	-	-	-	-	-	1	-
		CO 2	Apply the learned principles in planning, designing and management of fire safe buildings	2	1	1	-	1	1	-	-	-	-	1	-	1	1	-
		CO 3	Assess fire fighting installations, control technologies and hazardous materials	1	2	1	-	1	1	-	-	-	-	-	-	1	1	1
		CO 4	Design of fire safety building for fire resistant construction by following safety legislation	1	-	1	1	1	1	-	1	-	-	-	-	-	1	1
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1.5	1.5	1	1	1	1	-	1	-	-	1	-	1	1	1
71	Industrial and Biomedical applications of RF Energy	CO 1	Understanding of basic concepts and Principles of EM wave, propagation reflection and transmission. [Understanding]	3	2	-	-	-	-	-	-	3	-	-	-	-	1	-
		CO 2	Apply the knowledge for interest in complex dielectric constant, dipolar loss mechanism and design mechanism to understand	3	2	-	-	-	-	-	-	3	-	-	-	1	-	-
		CO 3	Analyze the structure of RF heating in industrial application. [Analyzing]	3	2	3	-	-	-	-	-	3	-	-	-	-	1	-
		CO 4	Design of Hazards and safety standards in various engineering problem. [Create & Design].	3	3	3	3	-	-	-	-	3	-	-	-	-	1	-
		CO 5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				3	2.25	3	3	-	-	-	-	3	-	-	-	1	1	-
72	Robotics and	CO 1	Understand the fundamentals of robotics and its components, methods of linear motion into rotary motion and vice-versa.	3	3	2	2	2	3	3	3	2	-	3	3	2	-	-
		CO 2	Apply the appropriate techniques for movement of robotic joints with computers/microcontrollers. [Applying &	3	2	2	2	-	3	2	-	3	2	3	3	2	-	-
		CO 3	Analyze parameters required to be controlled in a Robot for specific application. [Analyzing]	3	2	3	3	3	3	-	-	2	2	2	3	2	-	-

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Department of Mechanical Engineering																				
B.Tech. in Mechanical Engineering																				
CO-PO Mapping (Session 2023-24)																				
SN	Course Code	Course Name	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	1FY2-01	Engineering Mathematics-I	CO1	Define the sequence ,series and multivariable calculus.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Explain the certain method for the test of series and solution of Fourier series.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO3	Apply the principles of integral to solve a variety of practical problems in sciences and engineering.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO4	Analyze concepts of functions with several variables, its derivatives in partial forms with other important related concepts, their applications in	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
					2.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-		
2	1FY2-02	Engineering Physics	CO1	Describe the concepts of Wave and Quantum mechanics, Laser and Fiber optics, electromagnetic theory and material science	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Explain the different applications of Laser and optical fibers in communication, engineering, medicine and Science.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO3	Find energy states in 1-D and 3-D box with the application of quantum mechanics.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO4	Analyze the crystal structure through X-ray Diffraction & wavelength of light through Newton's ring experiment and Michelson- interferometer	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
					2.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-		
3	1FY1-05	Human Values	CO1	Relate sustained happiness through identifying the essentials of human values and skills	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	
			CO2	Find the happiness and human values in terms of personal and social life to create harmony in them	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	
			CO3	Use and understand practically the importance of trust, mutually satisfaction and human relationship	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	
			CO4	Identify the orders of nature for the holistic perception of harmony for human existence	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	
			CO5	Implement professional ethics and natural acceptance of human values in his/her life	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	
					-	-	-	-	-	2.00	-	2.50	-	-	-	2.00	-	-	-	
4	1FY3-07	Basic Mechanical Engineering	CO1	Describe concepts of thermal, functional design of machine elements, materials and primary manufacturing process.	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	
			CO2	Classify different types of turbines and power plants, pumps and IC engines, refrigeration system, transmission of power, engineering materials	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
			CO3	Apply the fundamental knowledge of thermal engineering, in addition to understanding of materials and primary manufacturing process to solve the	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
			CO4	Examine about the turbine & pumps, IC engines, refrigeration system, modes of transmission of power, materials and primary manufacturing	-	1	-	-	-	-	-	-	-	-	-	-	-	2	1	
			CO5	Evaluate problems related to refrigeration, turbine, pump, power transmission and primary manufacturing process.	-	2	-	-	-	-	-	-	-	-	-	-	-	2	1	
					2.50	1.50	-	-	-	-	-	-	-	-	-	-	2.00	2.00	1.00	

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			CO4	Assess the User Defined functions, Memory management and File concepts to solve real time problems using C Programming	-	2	-	-	-	-	-	-	-	-	-	-	-	-
					2.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-
15	2FY3-08	Basic Electrical Engineering	CO1	Define various ac and dc circuit related problems	1	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO2	Explain electromechanical energy conversion process	2	-	-	-	-	-	-	-	-	-	-	1	-	-
			CO3	Classify characteristics of various power electronic devices.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO4	Identify knowledge of protective devices and energy consumption calculations.	-	2	-	-	-	-	-	-	-	-	-	2	-	-
					2.00	2.00	-	-	-	-	-	-	-	-	-	1.50	-	-
16	2FY2-21	Engineering Chemistry Lab	CO1	Determine the strength of unknown solution by volumetric analysis.	1	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO2	Examine the characteristics of lubricating oil in groups	-	-	-	-	-	-	-	2	-	-	-	-	-	-
			CO3	Analyze different characteristics of water and fuel to solve societal and environmental problems	-	-	-	-	-	-	2	-	-	-	-	-	-	-
			CO4	Students will show an ability to work as a team member ethically	-	-	-	-	-	-	-	2	3	-	-	-	-	-
					1.00	-	-	-	-	-	-	2.00	2.00	2.50	-	-	-	-
17	2FY1-22	Language Lab	CO1	Use and pronounce the words correctly.	-	-	-	-	-	-	-	-	1	-	-	-	-	-
			CO2	Acquire knowledge of the correct expressions,vocabulary etc. in personal and professional lives.	-	-	-	-	-	-	-	-	2	-	-	-	-	-
			CO3	Plan successfully for leadership and teamwork,crack GD's, interviews and other professional activities.	-	-	-	-	-	-	-	-	2	-	-	-	-	-
			CO4	Synthesize the process of communication using LSRW.	-	-	-	-	-	-	-	-	3	-	-	-	-	-
					-	-	-	-	-	-	-	-	2.00	2.00	-	-	-	-
18	2FY3-24	Computer Programming Lab	CO1	Relate the fundamental of C Programming as variable, operators and taxonomy to write a basic C Program	1	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO2	Write programs that perform operations using condition control statements and loop control statements, single and multi-dimensional arrays along with	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO3	Use C programs to implement operations related to Array, Macros and inline functions, Dynamic memory allocations, concept of Structure, Unions	3	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO4	Students will show an ability to communicate effectively and work ethically	-	-	-	-	-	-	-	2	-	2	-	-	-	-
					2.00	-	-	-	-	-	-	-	2.00	-	2.00	-	-	-
19	2FY3-26	Basic Electrical Engineering Lab	CO1	Discuss measurement of electrical quantites	1	-	-	-	-	-	-	-	-	-	-	1	2	-
			CO2	Compare different connections of transformer	2	-	-	-	-	-	-	-	-	-	-	1	2	-
			CO3	Demonstrate constructional features of electrical machines and converters	3	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO4	Students will show an ability to communicate effectively and work as a team member ethically	-	-	-	-	-	-	-	2	3	2	-	-	-	-

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			CO4	Justify the isothermal transformation diagrams and heat treatment processes for metallic material to obtain the desired properties in it.	-	-	2	-	-	-	-	-	-	-	-	-	2	2	2
					2.00	2.00	2.00	-	-	-	-	-	-	-	-	-	2.00	2.00	2.00
26	3ME4-07	Mechanics of Solids	CO1	Explain basic concepts of stress, strain, torsion, bending and strain Energy.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO2	Apply the concept of stresses and strain, theories of failure, bending & torsion on different types of loading conditions and sections.	2	-	-	-	-	-	-	-	-	-	-	-	3	2	2
			CO3	Analyze the stresses in shafts, cylindrical and spherical thin wall pressure vessels, long and short columns for different end conditions.	-	2	-	-	-	-	-	-	-	-	-	-	3	2	2
			CO4	Evaluate the deflection of beams and stresses in principal plane by analytical & graphical method.	-	-	3	-	-	-	-	-	-	-	-	-	3	2	-
					2.00	2.00	3.00	-	-	-	-	-	-	-	-	-	2.75	2.00	2.00

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					2.00	2.00	-	-	-	-	-	-	-	-	-	-	2.00	2.00	-
37	4ME4-07	Theory of Machines	CO1	Explain the basic principles of machines, mechanisms & its inversions and working of various mechanical elements.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO2	Solve the basic problems on various fundamental machine mechanisms by graphical and analytical method.	3	-	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO3	Evaluate the various mechanisms and motion of various mechanical components like Power screw, Clutches, Gears, Gear Trains, Cam &	-	-	2	-	-	-	-	-	-	-	-	-	2	2	2
			CO4	Analyse the terms, laws and concepts related with machines, machine parts and mechanisms to solve the problems related with practical applications.	-	2	-	-	-	-	-	-	-	-	-	-	2	2	2
					2.50	2.00	2.00	-	-	-	-	-	-	-	-	-	2.00	2.00	2.00
38	4ME3-21	Digital Electronics Lab	CO1	Verify the truth tables of various types of logic gates and Boolean expression.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO2	Realise different arithmetic operations using logic gates.	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO3	Design the different combinational circuits using digital ICs.	-	-	3	-	-	-	-	-	-	-	-	-	2	-	-
			CO4	Develop the different sequential circuits using digital ICs.	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
					2.00	2.00	2.50	-	-	-	-	-	-	-	-	-	-	2.00	-
39	4ME4-22	Fluid Mechanics Lab	CO1	Determine various fluid parameters with the help of experimental setup.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO2	Explain the velocity distribution and velocity profile in pipes and over flat plates.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO3	Apply the concepts of fluid mechanics theorems for its verification with experimentation,	-	3	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO4	Analyse the characteristic curves through experimental data of fluid machines.	-	2	-	-	-	-	-	-	-	-	-	-	2	2	-
					2.00	2.50	-	-	-	-	-	-	-	-	-	-	2.00	2.00	-
40	4ME4-23	Production Practise Lab	CO1	Explain the working principle, operations and specifications of machine tools.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO2	Perform operations on various machine tools.	-	-	-	-	2	-	-	2	2	-	-	2	2	2	-
			CO3	Analyse the various properties and strength of moulding sand	-	2	-	-	-	-	-	-	-	-	-	2	2	-	-
			CO4	Develop a mould and cast replica of a given pattern in group or individual.	-	-	-	-	-	-	-	2	2	-	-	2	2	2	-
					2.00	2.00	-	-	2.00	-	-	2.00	2.00	-	-	2.00	2.00	2.00	-
41	4ME4-24	Theory of Machines Lab	CO1	Explain the basic mechanism of Mechanical elements and machines.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO2	Apply the basic concept of theory of machine to prepare velocity and acceleration diagram.	2	-	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO3	Analyse the coefficient of friction and power transmission of various mechanism.	-	2	-	-	-	-	-	-	-	-	-	-	2	2	2
			CO4	Evaluate theoretical and experimental parameter of gyroscope, governors, cam followers, brakes and clutches.	-	-	-	-	-	-	-	2	2	-	-	2	2	2	2
					2.00	2.00	-	-	-	-	-	2.00	2.00	-	-	2.00	2.00	2.00	2.00
				Semester IV (Average Mapping)	2.17	2.15	2.38	-	2.00	2.00	-	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00
				Semester I,II,III,IV (Cumulative Mapping)	2.04	1.97	2.33	-	2.25	2.00	2.00	2.03	2.36	2.06	2.00	2.00	1.77	1.88	1.50

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71	7CS6-60.1	7CS 6001 (Open Elective-1)	CO3	Formulate effectively customer requirements and convert them into detailed engineering	-	2	-	-	-	-	-	-	-	-	-	-	-	-
			CO4	Measure themselves against internal or external standards and to improve the capability of their business processes.	-	-	2	-	-	-	-	-	-	-	-	2	-	-
					2.00	2.00	2.00	-	-	-	-	-	-	-	-	2.00	-	-
72	7CS6-60.2	Cyber Security (Open Elective-1)	CO1	Apply basic concepts of Cybercrime and legal Perspectives of Security Implications for Organizations in respect to the Mobile and Wireless	2	-	-	-	-	-	-	-	-	-	-	1	-	-
			CO2	Analyze offences, attacks and Criminals plan for the cyber space.	-	2	-	-	-	-	-	-	-	-	-	1	-	-
			CO3	Compose the cyber security solutions and cyber security Tools in Cybercrime.	-	2	-	-	3	-	-	-	-	-	-	-	-	-
			CO4	Select the Management Perspective human role in security systems with an Organizational, emphasis on ethics, social engineering vulnerabilities and	-	1	-	-	-	-	-	-	-	-	-	1	-	-
					2.00	1.67	-	-	3.00	-	-	-	-	-	-	1.00	-	-
73	7EC6-60.1	Principle of Electronic communication	CO1	Describe the principles of various digital modulation systems and their properties,including bandwidth, channel capacity, transmission over	2	-	-	-	-	-	-	-	-	-	-	-	-	-
			CO2	Apply the concepts to practical applications in telecommunication	3	-	-	-	-	-	-	-	-	2	-	-	-	-
			CO3	Analyse communication systems in both the time and frequency domains.	-	2	2	-	2	-	-	-	-	-	-	-	1	-
			CO4	Design a communication system comprised of both analog and digital modulation techniques.	-	-	2	-	-	-	-	-	-	2	-	-	1	-
					2.50	2.00	2.00	-	2.00	-	-	-	-	2.00	-	-	1.00	-

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90	8ME4-21	Industrial Engineering Lab	CO1	Explain various process charts and ABC analysis of data set	2	-	-	-	-	-	-	-	-	-	-	2	2	-	
			CO2	Apply OR software tool to solve operations research problems.	-	3	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO3	Develop Bill of Materials/Product structure tree and calculate planned order release (POR) using MRP format	-	-	2	-	-	-	-	2	2	2	-	-	2	3	-
			CO4	Carryout a case study on project management, sales forecasting, plant layout and capacity planning	-	-	-	-	-	-	-	2	2	2	2	2	-	2	-
					2.00	3.00	2.00	-	-	-	-	2.00	2.00	2.00	2.00	2.00	2.25	-	
91	8ME4-22	Metrology Lab	CO1	Apply the principle of metrology for measuring various parameters by using different measuring instruments.	2	-	-	-	-	-	-	-	-	-	-	2	2	-	
			CO2	Analyze the surface generated on the work piece during various machining operations.	-	2	-	-	-	-	-	-	-	-	-	-	2	2	-
			CO3	Evaluate various metrological parameters using metrological instruments	-	-	2	-	-	-	-	2	2	-	-	2	2	2	-
			CO4	Develop a plot for composite errors of a given set of gears using composite gear tester.	-	-	2	-	-	-	-	2	-	-	-	2	2	2	-
					2.00	2.00	2.00	-	-	-	-	2.00	2.00	-	-	2.00	2.00	2.00	-
92	8ME7-50	Final Project	CO1	Apply the knowledge of engineering and sciences to finalize the problem statement.	3	-	-	-	-	2	2	-	-	-	-	2	2	2	
			CO2	Analyse the existing research in the field of stated problem.	-	3	-	-	-	-	-	-	-	-	-	3	3	2	
			CO3	Formulate the research plan for the solution of the stated problem.	-	-	3	3	2	2	-	-	2	-	-	2	3	3	2
			CO4	Develop a physical/ simulated prototype as a solution and validate the results.	-	-	-	-	-	-	-	-	3	-	2	3	2	3	2
			CO5	To prepare report and present the findings of the study conducted in a team or individual.	-	-	-	-	-	-	-	2	3	3	3	3	3	2	2
					-	3.00	3.00	3.00	2.00	2.00	-	2.00	2.67	3.00	2.50	2.67	2.75	2.75	2.00
				Semester VIII (Average Mapping)	2.45	2.48	2.25	2.00	2.00	2.00	-	2.00	2.22	2.50	2.25	2.22	2.19	2.03	2.00
				Semester I,II,III,IV,V,VI,VII & VIII (Commulative Mapping)	2.14	2.08	2.24	1.50	2.19	2.00	2.00	2.01	2.21	2.10	2.04	2.03	1.88	1.93	1.75
				Proposed Target	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
				Curriculum Target Gap	0.86	0.92	0.76	1.50	0.81	1.00	1.00	0.99	0.79	0.90	0.96	0.97	1.12	1.07	1.25