

2.6.1 STUDENT PERFORMANCE AND LEARNING OUTCOMES

**Department of Electrical And Electronics Engineering I & II Sem Course Outcomes
 For The Academic Year 2021-22 (Regulation - R18)**

Department of Electrical And Electronics Engineering I & II Sem Course Outcomes For The Academic Year 2021-22 (R18)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	ENGINEERING MECHANICS	CO1:Determine resultant of forces acting on a body and analyze equilibrium of a body subjected to a system of forces.
			CO2:Solve problem of bodies subjected to friction.
			CO3:Find the location of centroid and calculate moment of inertia of a given section.
			CO4:Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
			CO5:Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.
2	II/I	ELECTRICAL CIRCUIT ANALYSIS	CO1:Apply network theorems for the analysis of electrical circuits.
			CO2:Obtain the transient and steady-state response of electrical circuits.
			CO3:Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
			CO4:Analyze Transfer functions/Network functions in Electrical Circuit.
			CO5:Analyze two port circuit behavior.
3	II/I	ANALOG ELECTRONICS	CO1:Know the characteristics, utilization of various components.
			CO2:Understand the biasing techniques.
			CO3:Design and analyze various rectifiers, small signal amplifier circuits.
			CO4:Design sinusoidal and non-sinusoidal oscillators.
			CO5:A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.
4	II/I	ELECTRICAL MACHINES – I	CO1:To Identify different parts of a DC generators & understand its operation, different excitation and starting methods of DC Generators.
			CO2:To Identify different parts of a DC Motors & understand its operation, different excitation and starting methods of DC Motors.
			CO3:To Carry out different testing methods to predetermine the efficiency of DC machines and control the voltage and

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			<p>speed of a DC machines.</p> <p>CO4:To Analyze single phase and three phase transformers circuits.</p> <p>CO5:To Carry out different testing methods to predetermine the efficiency of transformers.</p>
5	II/I	ELECTROMAGNETIC FIELDS	<p>CO1:To understand the basic laws of electromagnetism.</p> <p>CO2:To obtain the electric and magnetic fields for simple configurations under static conditions.</p> <p>CO3:To analyze time varying electric and magnetic fields.</p> <p>CO4:To understand Maxwell's equation in different forms and different media.</p> <p>CO5:To understand the propagation of EM waves.</p>
6	II/I	ELECTRICAL MACHINES LAB – I	<p>CO1:Start and control the Different DC Machines</p> <p>CO2:Assess the performance of different machines using different testing methods</p> <p>CO3:Identify different conditions required to be satisfied for self - excitation of DC Generators</p> <p>CO4:Separate iron losses of DC machines into different components</p> <p>CO5:Identify different performance characteristics</p>
7	II/I	ANALOG ELECTRONICS LAB	<p>CO1:Know the characteristics, utilization of various components.</p> <p>CO2:Understand the biasing techniques</p> <p>CO3:Design and analyze various rectifiers, small signal amplifier circuits</p> <p>CO4:Design sinusoidal and non-sinusoidal oscillators.</p> <p>CO5:A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits</p>
8	II/I	ELECTRICAL CIRCUITS LAB	<p>CO1:Analyze complex DC and AC linear circuits</p> <p>CO2:Apply concepts of electrical circuits across engineering</p> <p>CO3:Evaluate response in a given network by using theorems</p> <p>CO4:Analyze a given network by applying various Network Theorems</p> <p>CO5:Measure three phase Active and Reactive power</p>
9	II/I	GENDER SENSITIZATION LAB	<p>CO1:Students will have developed a better understanding of important issues related to gender in contemporary India.</p> <p>CO2:Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p> <p>CO3:Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p> <p>CO4:Students will acquire insight into the gendered division of labour and its relation to politics and economics.</p>

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			CO5:Men and women students and professionals will be better equipped to work and live together as equals.
10	II/II	LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES	CO1:To understand the Standard functions of Laplace transforms and inverse Laplace transforms.
			CO2:To obtain and estimate the value for the given data using interpolation.
			CO3:To analyze and find the numerical solutions for a given first order ODE's
			CO4:To understand differentiation and integration of complex valued functions..
			CO5:To analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
11	II/II	ELECTRICAL MACHINES – II	CO1:To Understand the concepts of rotating magnetic fields.
			CO2:Analyze performance characteristics of ac machines.
			CO3:To analyze the concept of regulation and its calculations.
			CO4:To Understand the operation of ac machines.
			CO5:To understand operation, construction and types of single-phase motors.
12	II/II	DIGITAL ELECTRONICS	CO1:Understand working of logic families and logic gates.
			CO2:Design and implement Combinational circuits.
			CO3:Design and implement Sequential logic circuits.
			CO4:Understand the process of Analog to Digital conversion and Digital to Analog conversion.
			CO5:Be able to use PLDs to implement the given logical problem.
13	II/II	CONTROL SYSTEMS	CO1:To Understand the modeling of linear-time-invariant systems using transfer function.
			CO2:To Understand the concept of stability and its assessment for linear-time invariant systems using Time Domain Analysis.
			CO3:To Understand the concept of stability and its assessment for linear-time invariant systems using Frequency Domain Analysis.
			CO4:To Understand how to Design simple feedback controllers.
			CO5:To Understand the modeling of linear-time-invariant systems using state space representation.
14	II/II	POWER SYSTEM – I	CO1:To Understand the concepts of power systems and renewable sources of electrical power.
			CO2:To Evaluate the power tariff methods.
			CO3:To Understand the Insulators and underground cables.
			CO4:To Determine the electrical circuit parameters of transmission lines and corona.

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			CO5:To Understand A.C. and D.C. distribution systems.
15	II/II	DIGITAL ELECTRONICS LAB	CO1:Understand working of logic families and logic gates
			CO2:Design and implement Combinational and Sequential logic circuits
			CO3:Understand the process of Analog to Digital conversion and Digital to Analog conversion
			CO4:Be able to use PLDs to implement the given logical problem
			CO5:Implement synchronous state machines using flip-flops
16	II/II	ELECTRICAL MACHINES LAB – II	CO1:Assess the performance of different machines using different testing methods
			CO2:To convert the Phase from three phase to two phase and vice versa
			CO3:Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
			CO4:Control the active and reactive power flows in synchronous machines
			CO5:Start different machines and control the speed and power factor
17	II/II	CONTROL SYSTEMS LAB	CO1:How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application
			CO2:Apply various time domain and frequency domain techniques to assess the system performance
			CO3:Apply various control strategies to different applications (example: Power systems, electrical drives etc)
			CO4:Test system controllability and observability using state space representation and applications of state space representation to various systems
			CO5:Design various controllers and compensators to improve system performance
18	II/II	CONSTITUTION OF INDIA	CO1:Meaning of the constitution law and constitutionalism
			CO2:Historical perspective of the Constitution of India
			CO3:Salient features and characteristics of the Constitution of India
			CO4:Scheme of the fundamental rights
			CO5:The scheme of the Fundamental Duties and its legal status
19	III/I	POWER ELECTRONICS	CO1:To understand the differences between signal level and power level devices.
			CO2:To Analyze controlled rectifier circuits.
			CO3:To Analyze the operation of DC-DC choppers.
			CO4:To analyze the operation of voltage source inverters.
			CO5:To analyze the operation of AC Voltage regulator and

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			cyclo-converter.
20	III/I	POWER SYSTEM – II	CO1:Analyze transmission line performance.
			CO2:Apply load compensation techniques to control reactive power.
			CO3:Understand the application of per unit quantities.
			CO4:Design over voltage protection and insulation coordination.
			CO5:Determine the fault currents for symmetrical and unbalanced faults.
21	III/I	MEASUREMENTS AND INSTRUMENTATION	CO1:To understand different types of measuring instruments.
			CO2:To analyze their construction of potentiometers and instrument transformers.
			CO3:To apply to measure of energy and power.
			CO4:Identify the measuring instruments of resistance, inductance and capacitance.
			CO5:Apply the knowledge about transducers.
22	III/I	HIGH VOLTAGE ENGINEERING	CO1:To understand the basic laws of electromagnetism.
			CO2:To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3:To analyze time varying electric and magnetic fields
			CO4:To understand Maxwell's equation in different forms and different media.
			CO5:To understand the propagation of EM waves.
23	III/I	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1:The students will understand the various Forms of Business and the impact of economic variables on the Business.
			CO2:The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
			CO3:The Students can study the firm's financial position by analyzing the Financial Statements of a Company.
			CO4:Ascertain the provisions of capital
			CO5:Enumerate the concept of capital budgeting and allocations of the resources through capital
24	III/I	POWER SYSTEM SIMULATION LAB	CO1:Perform various transmission line calculations
			CO2:Understand Different circuits time constants
			CO3:Analyze the experimental data and draw the conclusions
			CO4:To perform voltage distributions across insulator strings
			CO5:To understand the high frequency transients
25	III/I	POWER ELECTRONICS LAB	CO1:Understand the operating principles of various power electronic converters
			CO2:Use power electronic simulation packages& hardware to develop the power converters.
			CO3:Analyze and choose the appropriate converters for

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			<p>various applications</p> <p>CO4:Apply the concepts of power electronic converters for efficient conversion/control of power from source to load.</p> <p>CO5:Design the power converter with suitable switches meeting a specific load requirement.</p>
26	III/I	MEASUREMENTS AND INSTRUMENTATION LAB	<p>CO1:Student is able to choose instruments</p> <p>CO2:Student is able to test any instrument</p> <p>CO3:Student is able to find the accuracy of any instrument by performing experiment</p> <p>CO4:Student is able to calibrate PMMC instrument using D.C potentiometer</p> <p>CO5:Student is able to calibrate LPF Watt Meter, energy meter, P. F Meter using electro dynamo meter type instrument as the standard instrument</p>
27	III/I	ADVANCED COMMUNICATION SKILLS LAB	<p>CO1:To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts</p> <p>CO2:Further, they would be required to communicate their ideas relevantly and coherently in writing.</p> <p>CO3:To prepare all the students for their placements</p> <p>CO4:Gathering ideas and information to organize ideas relevantly and coherently.</p> <p>CO5:Transferring information from non-verbal to verbal texts and vice-versa.</p>
28	III/I	INTELLECTUAL PROPERTY RIGHTS	<p>CO1:Introduction to Intellectual property</p> <p>CO2:Trade Marks</p> <p>CO3:Law of copy rights</p> <p>CO4:Trade Secrets</p> <p>CO5:New development of intellectual property</p>
29	III/II	NON-CONVENTIONAL SOURCES OF ENERGY	<p>CO1:Understand the basic concepts and operation of renewable energy systems</p> <p>CO2:Remember the ideas and statistics of current RES availability and usage.</p> <p>CO3:Analyze the problems in RES installation in real time.</p> <p>CO4:Identify the other NCES and available sources improvement.</p> <p>CO5:Apply the renewable energy systems in real time applications.</p>
30	III/II	POWER SEMICONDUCTOR DRIVES	<p>CO1:To Identify the drawbacks of speed control of motor by conventional methods AND Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits.</p> <p>CO2:To chopper-controlled DC drives speed-torque</p>

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			<p>characteristics merits and demerits.</p> <p>CO3:Understand Control of Induction Motor drive speed-torque characteristics using different control strategies its merits and demerits.</p> <p>CO4:To Describe Slip power recovery schemes.</p> <p>CO5:Understand Control of Synchronous Motors speed-torque characteristics using different control strategies its merits and demerits.</p>
31	III/II	SIGNALS AND SYSTEMS	<p>CO1:Understand the basic concept of signals and systems , analogy between vectors and signals.</p> <p>CO2:Understand the fourier series, fourier transform an its properties.</p> <p>CO3:Understand the relation between linear system and bandwidth.</p> <p>CO4:Analyze the properties of laplace transform and z transform.</p> <p>CO5:Understand the concept of sampling theorem and properties of correlation.</p>
32	III/II	MICROPROCESSORS & MICROCONTROLLERS	<p>CO1:Understand the internal architecture, organization and assembly language programming of 8086 processors.</p> <p>CO2:Understand the internal architecture, organization and assembly language programming of 8051/controllers.</p> <p>CO3:Understand the interfacing techniques to 8086 and 8051 based systems.</p> <p>CO4:Understands the internal architecture of ARM processors.</p> <p>CO5:Understand the basic concepts of advanced ARM processors.</p>
33	III/II	POWER SYSTEM PROTECTION	<p>CO1:Compare and contrast electromagnetic, static and microprocessor-based Relays.</p> <p>CO2:Apply technology to protect power system components.</p> <p>CO3:Select relay settings of neutral grounding for overall protection.</p> <p>CO4:To understand the Amplitude and Phase comparators.</p> <p>CO5:Analyze quenching mechanisms used in air, oil and vacuum circuit breakers.</p>
34	III/II	POWER SYSTEM OPERATION AND CONTROL	<p>CO1:Analyze Load Flow Studies</p> <p>CO2:Understand economic operation of power systems.</p> <p>CO3:Address load frequency control problem.</p> <p>CO4:Analyze whether the machine is in stable or unstable position.</p> <p>CO5:Analyze various functions of Energy Management System (EMS) functions.</p>
35	III/II	POWER SYSTEMS LAB	<p>CO1:Perform various load flow techniques</p> <p>CO2:Understand Different protection methods</p>

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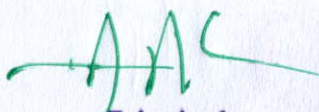
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			<p>CO3:Analyze the experimental data and draw the conclusions.</p> <p>CO4:Perform testing of CT, PT's and Insulator strings</p> <p>CO5:Perform fault analysis on Transmission line models and Generators.</p>
36	III/II	MICROPROCESSORS & MICROCONTROLLERS LAB	<p>CO1:Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.</p> <p>CO2:Time delay Generation Using Timers of 8051.</p> <p>CO3:Serial Communication from / to 8051 to / from I/O devices.</p> <p>CO4:7 Segment Display to 8051.</p> <p>CO5:Sequence Generator Using Serial Interface in 8051.</p>
37	III/II	SIGNALS AND SYSTEMS LAB	<p>CO1:Understand the concepts of continuous time and discrete time systems.</p> <p>CO2:Analyse systems in complex frequency domain.</p> <p>CO3:Understand sampling theorem and its implications.</p> <p>CO4:Develop ability to analyze linear systems and signals</p> <p>CO5:Develop critical understanding of mathematical methods to analyze linear systems and signals</p>
38	III/II	ENVIRONMENTAL SCIENCE	<p>CO1:Understanding the importance of ecological balance for sustainable development.</p> <p>CO2:Understanding the impacts of developmental activities and mitigation measures</p> <p>CO3:Understanding the environmental policies and regulations</p> <p>CO4:Understand /evaluate / develop technologies on the basis of ecological principles</p> <p>CO5:Understand /evaluate / develop technologies on environmental regulations which in turn helps in sustainable development</p>
39	IV/I	PRINCIPLES OF ENTREPRENEURSHIP	<p>CO1:Introduction to Entrepreneurship.</p> <p>CO2:Financing and Managing.</p> <p>CO3:Industrial Financial Support.</p> <p>CO4:Production and marketing management.</p> <p>CO5:Labour legislation.</p>
40	IV/I	DIGITAL CONTROL SYSTEMS	<p>CO1:Obtain discrete representation of LTI systems.</p> <p>CO2:Analyze stability of open loop and closed loop discrete-time systems.</p> <p>CO3:Obtain State space models of discrete systems</p> <p>CO4:Design and analyze digital controllers.</p> <p>CO5:Design state feedback and output feedback controllers</p>
41	IV/I	INDUSTRIAL ELECTRICAL SYSTEMS	<p>CO1:To understand electrical system components representing the systems with standard symbols and drawings, SLD.</p> <p>CO2:To understand the electrical wiring systems for</p>

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			residential, commercial and industrial consumers.
			CO3: To understand illumination systems.
			CO4: To understand various components of industrial electrical systems.
			CO5: To analyze and select the proper size of various electrical system components.
42	IV/I	FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS	CO1: The students understand different concepts of management in all aspects.
			CO2: To know the scope and importance of leadership qualities and skills.
			CO3: Student understand the importance of Motivation, Power, Authority flow in the organization.
			CO4: To explore student in all the studies of Management and theories of Management.
			CO5: Students learn the importance of planning and organizing theories in depth.
43	IV/I	ELECTRICAL & ELECTRONICS DESIGN LAB	CO1: Get practical knowledge related to electrical
			CO2: Fabricate basic electrical circuit elements/networks
			CO3: Trouble shoot the electrical circuits
			CO4: Design filter circuit for application
			CO5: Get hardware skills such as soldering, winding etc.
44	IV/II	DATABASE MANAGEMENT SYSTEMS	CO1: To Understand model E-R diagrams for enterprise database.
			CO2: To formulate queries using SQL.
			CO3: To apply different normal forms to design the database.
			CO4: To summarize concurrency control and recovery algorithms.
			CO5: To identify suitable indices and hashing mechanisms for effective storage.
45	IV/II	AI TECHNIQUES IN ELECTRICAL ENGINEERING	CO1: Understand feed forward neural networks, feedback neural networks and learning techniques.
			CO2: Understand fuzziness involved in various systems and fuzzy set theory.
			CO3: Develop fuzzy logic control for applications in electrical engineering.
			CO4: Develop genetic algorithm for applications in electrical engineering.
			CO5: Applications of AI Techniques.
46	IV/II	ELECTRICAL DISTRIBUTION SYSTEMS	CO1: Distinguish between transmission, and distribution line and design the feeders
			CO2: Compute power loss and voltage drop of the feeders
			CO3: Design protection of distribution systems
			CO4: Understand the importance of power factor improvement
			CO5: Understand the importance of voltage control

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S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	ELECTRONIC DEVICES AND CIRCUITS	CO1:Understand the characteristics of diode and concept of clippers ,clampers, rectifiers.
			CO2:Understand the biasing techniques of BJT and BJT characteristics.
			CO3:Understand the concept of special purpose devices and understand the FET characteristics.
			CO4:Design and understand the small signal amplifier BJT circuits.
			CO5:Analysis of small signal FET amplifiers.
2	II/I	NETWORK ANALYSIS AND TRANSMISSION LINES	CO1:Gain the knowledge on basic RLC circuits behavior.
			CO2:Analyze the Steady state and transient analysis of RLC Circuits.
			CO3:Know the characteristics of two port network parameters.
			CO4:Analyze the transmission line parameters and configurations
			CO5:Develop the state models from block diagram.
3	II/I	DIGITAL SYSTEM DESIGN	CO1:Understand the common forms of number representation in logic circuits.
			CO2:Understand the numerical information in different forms and Boolean Algebra theorems.
			CO3:Understand Postulates of Boolean algebra and to minimize combinational functions.
			CO4:Design and Analyze combinational and sequential circuits.
			CO5:Know about the logic families and realization of logic gates.
4	II/I	SIGNALS AND SYSTEMS	CO1:Understand the characteristics of diode and concept of clippers ,clampers, rectifiers.
			CO2:Understand the biasing techniques of BJT and BJT characteristics.
			CO3:Understand the concept of special purpose devices and understand the FET characteristics.
			CO4:Design and understand the small signal amplifier BJT circuits.
			CO5:Analysis of small signal FET amplifiers.
5	II/I	PROBABILITY THEORY AND STOCHASTIC PROCESSES	CO1:Understand the concepts of Random Process and its Characteristics.
			CO2:Understand the response of linear time Invariant

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			<p>system for a Random Processes.</p> <p>CO3:Determine the temporal characteristics of Random signals.</p> <p>CO4:Determine the Spectral characteristics of Random Signals.</p> <p>CO5:Understand the concepts of Noise in Communication systems.</p>
6	II/I	ELECTRONIC DEVICES AND CIRCUITS LAB	<p>CO1:Understand PN Junction diode characteristics A) Forward bias B) Reverse bias</p> <p>CO2:Understand Zener diode characteristics and Zener as voltage Regulator</p> <p>CO3:Understand Full Wave Rectifier with & without filters</p> <p>CO4:Understand Input and output characteristics of BJT in CE Configuration</p> <p>CO5:Analyze Measurement of h-parameters of transistor in CB, CE, CC configurations</p>
7	II/I	DIGITAL SYSTEM DESIGN LAB	<p>CO1:Design and realization logic gates using universal gates</p> <p>CO2:Design and realization of a 4 – bit gray to Binary and Binary to Gray Converter</p> <p>CO3:Design and realization of an 8 bit parallel load and serial out shift register using flip-flops.</p> <p>CO4:Design and realization of 8x1 MUX using 2x1 MUX</p> <p>CO5:Design and realization of 4 bit comparator</p>
8	II/I	BASIC SIMULATION LAB	<p>CO1:Basic Operations on Matrices</p> <p>CO2:Finding the Even and Odd parts of Signal/Sequence and Real and Imaginary parts of Signal</p> <p>CO3:Convolution for Signals and sequences</p> <p>CO4:Auto Correlation and Cross Correlation for Signals and Sequences</p> <p>CO5:Gibbs Phenomenon Simulation</p>
9	II/I	CONSTITUTION OF INDIA	<p>CO1:Meaning of the constitution law and constitutionalism</p> <p>CO2:Historical perspective of the Constitution of India</p> <p>CO3:Salient features and characteristics of the Constitution of India</p> <p>CO4:Scheme of the fundamental rights</p> <p>CO5:The scheme of the Fundamental Duties and its legal status</p>
10	II/II	LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES	<p>CO1:To understand the Standard functions of Laplace transforms and inverse Laplace transforms.</p> <p>CO2:To obtain and estimate the value for the given data using interpolation.</p> <p>CO3:To analyze and find the numerical solutions for a given first order ODE's</p> <p>CO4:To understand differentiation and integration of complex valued functions..</p>

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			<p>CO5:To analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.</p>
11	II/II	ELECTROMAGNETIC FIELDS AND WAVES	<p>CO1:Understand the basic laws of electrostatic fields.</p>
			<p>CO2:Understand the basic laws of magnetostatics.</p>
			<p>CO3:Analyze the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.</p>
			<p>CO4:Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.</p>
			<p>CO5:To understand the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.</p>
12	II/II	ANALOG AND DIGITAL COMMUNICATIONS	<p>CO1:Analyze and design of various continuous wave and angle modulation and demodulation techniques.</p>
			<p>CO2:Understand the effect of noise present in continuous wave and angle modulation techniques.</p>
			<p>CO3:Attain the knowledge about AM , FM Transmitters and Receivers.</p>
			<p>CO4:Analyze and design the various Pulse Modulation Techniques.</p>
			<p>CO5:Understand the concepts of Digital Modulation Techniques and Baseband transmission.</p>
13	II/II	LINEAR IC APPLICATIONS	<p>CO1:A thorough understanding of operational amplifiers with linear integrated circuits.</p>
			<p>CO2:Acquire the knowledge about the applications of op amps.</p>
			<p>CO3:Attain the knowledge of active filters, oscillators, and waveform generators.</p>
			<p>CO4:Attain the knowledge of functional diagrams and applications of IC 555 and IC 565.</p>
			<p>CO5:Acquire the knowledge about the Data converters.</p>
14	II/II	ELECTRONIC CIRCUIT ANALYSIS	<p>CO1:Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors.</p>
			<p>CO2:Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.</p>
			<p>CO3:Utilize the Concepts of positive feedback to generate sustained oscillations.</p>
			<p>CO4:Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.</p>
			<p>CO5:Design Multi vibrators and sweep circuits for various applications.</p>

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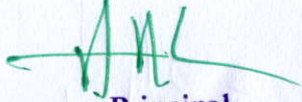
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15	II/II	ANALOG AND DIGITAL COMMUNICATIONS LAB	CO1:SSB-SC Modulator & Detector (Phase Shift Method)
			CO2:Frequency Division Multiplexing & De multiplexing
			CO3:Pulse Width Modulation & Demodulation
			CO4:PCM Generation and Detection
			CO5:Binary Phase Shift Keying: Generation and Detection
16	II/II	IC APPLICATIONS LAB	CO1:Inverting and Non-Inverting Amplifiers using Op Amps
			CO2:Adder and Subtractor using Op Amp.
			CO3:Integrator Circuit using IC 741.
			CO4:Differentiator Circuit using Op Amp
			CO5:Mono-Stable Multivibrator using IC 555.
17	II/II	ELECTRONIC CIRCUIT ANALYSIS LAB	CO1:Darlington Pair Circuit
			CO2:Current Shunt Feedback amplifier Circuit
			CO3:Voltage Series Feedback amplifier Circuit (*)
			CO4:RC Phase shift Oscillator Circuit (*)
			CO5:Hartley and Colpitt's Oscillators Circuit
18	II/II	GENDER SENSITIZATION LAB	CO1:Students will have developed a better understanding of important issues related to gender in contemporary India.
			CO2:Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
			CO3:Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
			CO4:Students will acquire insight into the gendered division of labour and its relation to politics and economics.
			CO5:Men and women students and professionals will be better equipped to work and live together as equals.
19	III/I	MICROPROCESSORS AND MICROCONTROLLERS	CO1:Understand the internal architecture, organization and assembly language programming of 8086 processors.
			CO2:Understand the internal architecture, organization and assembly language programming of 8051/controllers.
			CO3:Understand the interfacing techniques to 8086 and 8051 based systems.
			CO4:Understand the internal architecture of ARM processors.
			CO5:Understand the basic concepts of advanced ARM processors.
20	III/I	DATA COMMUNICATIONS AND NETWORKS	CO1:Know the Categories and functions of various Data communication Networks
			CO2:Design and analyze various error detection techniques
			CO3:Demonstrate the mechanism of routing the data in network layer
			CO4:Know the significance of various Flow control and

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			<p>Congestion control Mechanisms</p> <p>CO5: Know the Functioning of various Application layer Protocols.</p>
21	III/I	CONTROL SYSTEMS	<p>CO1: To Understand the modeling of linear-time-invariant systems using transfer function.</p> <p>CO2: To Understand the concept of stability and its assessment for linear-time invariant systems using Time Domain Analysis.</p> <p>CO3: To Understand the concept of stability and its assessment for linear-time invariant systems using Frequency Domain Analysis.</p> <p>CO4: To Understand how to Design simple feedback controllers.</p> <p>CO5: To Understand the modeling of linear-time-invariant systems using state space representation.</p>
22	III/I	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	<p>CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.</p> <p>CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt</p> <p>CO3: The Students can study the firm's financial position by analyzing the Financial Statements of a Company.</p> <p>CO4: Ascertain the provisions of capital</p> <p>CO5: Enumerate the concept of capital budgeting and allocations of the resources through capital</p>
23	III/I	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION	<p>CO1: Measure electrical parameters with different meters and understand the basic definition of measuring parameters</p> <p>CO2: Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.</p> <p>CO3: Operate an Oscilloscope to measure various signals.</p> <p>CO4: Extend the concepts of balance bridge to find out the unknown parameter with the given specifications. Measure various physical parameters by appropriately selecting the transducers.</p> <p>CO5: Understanding the concepts of various measuring bridges and their balancing conditions</p>
24	III/I	MICROPROCESSORS & MICROCONTROLLERS LAB	<p>CO1: Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.</p> <p>CO2: Time delay Generation Using Timers of 8051.</p> <p>CO3: Serial Communication from / to 8051 to / from I/O devices.</p> <p>CO4: 7 Segment Display to 8051.</p> <p>CO5: Sequence Generator Using Serial Interface in 8051.</p>
25	III/I	DATA COMMUNICATIONS	<p>CO1: Evaluate the performance of various LAN Topologies</p>

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		AND NETWORKS LAB	<p>CO2:Evaluate the performance of Drop Tail and RED queue management schemes</p> <p>CO3:Evaluate the performance of CBQ and FQ Scheduling Mechanisms</p> <p>CO4:Analyze the Protocols SCTP, ARP, NetBIOS, IPX VINES</p> <p>CO5:Analysis of HTTP, DNS and DHCP Protocols</p>
26	III/I	ADVANCED COMMUNICATION SKILLS LAB	<p>CO1:To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts</p> <p>CO2:Further, they would be required to communicate their ideas relevantly and coherently in writing.</p> <p>CO3:To prepare all the students for their placements</p> <p>CO4:Gathering ideas and information to organize ideas relevantly and coherently.</p> <p>CO5:Transferring information from non-verbal to verbal texts and vice-versa.</p>
27	III/I	INTELLECTUAL PROPERTY RIGHTS	<p>CO1:Introduction to Intellectual property</p> <p>CO2:Trade Marks</p> <p>CO3:Law of copy rights</p> <p>CO4:Trade Secrets</p> <p>CO5:New development of intellectual property</p>
28	III/II	ANTENNAS AND PROPAGATION	<p>CO1:Understand the fundamentals, basic parameters in the design of an antenna and apply for various designed antennas.</p> <p>CO2:Analyze antenna array systems of different antennas and field analysis under application of different currents to the individual antenna elements.</p> <p>CO3:Understand the requirements of microwave measurements and setup to carry out the antenna radiation pattern and understand the gain measurements and directivity measurements.</p> <p>CO4:Analyze the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas.</p> <p>CO5:Analyze micro strip antennas and Reflector antennas and feed methods of Reflectors.</p>
29	III/II	DIGITAL SIGNAL PROCESSING	<p>CO1:Understand the LTI system characteristics and Multirate signal processing.</p> <p>CO2:Compute the DTFT, DFT, and FFT of the discrete systems and Understand the inter-relationship between DFT and various transforms.</p> <p>CO3:Design and analyze digital infinite impulse filter with given specification using digital techniques.</p>

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			<p>CO4:Design and analyze digital infinite impulse filter with given specification and compare IIR and FIR filters.</p> <p>CO5:Understand the significance of various filter structures and effects of round off errors.</p>
30	III/II	VLSI DESIGN	<p>CO1:Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.</p> <p>CO2:Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit.</p> <p>CO3:Gate Level Design of Other complex gates, Switch logic, Alternate gate circuits.</p> <p>CO4:Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD.</p> <p>CO5:Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system.</p>
31	III/II	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	<p>CO1:Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading</p> <p>CO2:Identify classes, abstract classes, objects, members of a</p> <p>CO3:Class and the Relationships among them needed for a specific problem.</p> <p>CO4:Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling multithreaded applications with Synchronization).</p> <p>CO5:Develop Applications for Range of Problems Using Object-Oriented Programming Techniques</p>
32	III/II	NON-CONVENTIONAL SOURCES OF ENERGY	<p>CO1:Understand the basic concepts and operation of renewable energy systems</p> <p>CO2:Remember the ideas and statistics of current RES availability and usage.</p> <p>CO3:Analyze the problems in RES installation in real time.</p> <p>CO4:Identify the other NCES and available sources improvement.</p> <p>CO5:Apply the renewable energy systems in real time applications.</p>
33	III/II	DIGITAL SIGNAL PROCESSING LAB	<p>CO1:Generation of Sinusoidal Waveform / Signal based on Recursive Difference Equations</p> <p>CO2:Implementation of FFT of given Sequence</p> <p>CO3:Determination of Power Spectrum of a given Signal(s)</p> <p>CO4:Generation of Narrow Band Signal through Filtering</p> <p>CO5:Implementation of Decimation Process</p>
34	III/II	e - CAD LAB	<p>CO1:Realize all the logic gates</p> <p>CO2:Design of 8-to-3 encoder (without and with priority) and</p>

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			2-to-4 decoder
			CO3: Design of 8-to-1 multiplexer and 1-to-8 demultiplexer
			CO4: Design of 4 bit binary to gray code converter
			CO5: Design of 4 bit comparator
35	III/II	SCRIPTING LANGUAGES LAB	CO1: Ruby script to create a new string which is n copies of a given string where n is a nonnegative integer
			CO2: Ruby script which accept the radius of a circle from the user and compute the parameter and area
			CO3: Ruby script to find the greatest of three numbers
			CO4: Ruby script to print the elements of a given array
			CO5: TCL script to find the factorial of a number
36	III/II	ENVIRONMENTAL SCIENCE	CO1: Understand /evaluate / develop technologies on the basis of ecological principles
			CO2: Understand /evaluate / develop technologies on the basis of environmental regulations which in turn helps in sustainable development
			CO3: Understand Natural Resources: Classification of Resources
			CO4: Understand Biodiversity And Biotic Resources
			CO5: Understand Environmental Pollution and Control Technologies
37	IV/I	MICROWAVE AND OPTICAL COMMUNICATIONS	CO1: Analyze the characteristics of microwave tubes and compare them.
			CO2: Analyze the characteristics of M-type tubes and understand the various microwave solid state devices
			CO3: Understand the different types of waveguide components and ferrite components.
			CO4: Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.
			CO5: Understand the mechanism of light propagation through Optical Fibers.
38	IV/I	DIGITAL IMAGE PROCESSING	CO1: Explore the fundamental relations between pixels and utility of 2-D transforms in image processor and to Analyze image sampling and quantization requirements and implications
			CO2: To Design and implement two-dimensional spatial and frequency filters for image enhancement.
			CO3: To Model and Demonstrate the image restoration problem in both time and frequency domains
			CO4: To Explain the image segmentation and image compression problem and Develop & Illustrate Morphological Image Processing
			CO5: Understand the need of compression and evaluation of basic compression algorithms

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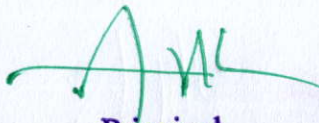
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39	IV/I	DATABASE MANAGEMENT SYSTEMS	CO1:To Understand model E-R diagrams for enterprise database
			CO2:To formulate queries using SQL
			CO3:To apply different normal forms to design the database
			CO4:To summarize concurrency control and recovery algorithms.
			CO5:To identify suitable indices and hashing mechanisms for effective storage
40	IV/I	PRINCIPLES OF ENTREPRENEURSHIP	CO1:Introduction to Entrepreneurship
			CO2:Financing and Managing
			CO3:Industrial Financial Support
			CO4:Production and marketing management
			CO5:Labour legislation
41	IV/I	PROFESSIONAL PRACTICE, LAW AND ETHICS	CO1:Understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
			CO2:The students will learn the rights and responsibilities as an employee, team member and a global citizen
			CO3:Understand Engagement of Labour and Labour & other construction-related Laws
			CO4:Understand Arbitration, Conciliation and ADR (Alternative Dispute Resolution) system
			CO5:Understand Law relating to Intellectual property
42	IV/I	MICROWAVE AND OPTICAL COMMUNICATIONS LAB	CO1:Characterization of Laser Diode
			CO2:Intensity modulation of Laser output through an optical fiber
			CO3:Measurement of Data rate for Digital Optical link
			CO4:Measurement of Numerical Aperture of fiber cable
			CO5:Measurement of losses for Optical link
43	IV/II	RADAR SYSTEMS	CO1:Understand about radar fundamentals and remember the radar ranges and parameters of general radar equation.
			CO2:Demonstrate the Doppler Effect and the concepts of continuous wave radars and the FM-CW Altimeter.
			CO3:Understand the operation of MTI radar and delay line cancellers.
			CO4:Remember the tracking radar systems and mono pulse radar.
			CO5:Analyze the detection of radar signals in noise and demonstrate the noise figure and radar receiver, Beam steering.
44	IV/II	LOW POWER VLSI DESIGN	CO1:Understand the need of Low power circuit design.
			CO2:Attain the knowledge of architectural approaches.
			CO3:Analyze and design Low-Voltage Low-Power Adders.
			CO4:Analyze and design Low-Voltage Low-Power Multipliers.

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			CO5: Known the design of Low-Voltage Low-Power Memories.
45	IV/II	BASICS OF POWER PLANT ENGINEERING	CO1: Over view of Thermal power plants.
			CO2: Over view of hydel power plants.
			CO3: Over view of nuclear power plants.
			CO4: Understand the importance of non-conventional power plants.
			CO5: Understand the importance of tariff.

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Department of Computer Science and Engineering I & II Sem Course Outcomes
For The Academic Year 2021-22 (Regulation - R18)

Department of Computer Science and Engineering I & II Sem Course Outcomes For The Academic Year 2021-22 (R18)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	ANALOG AND DIGITAL ELECTRONICS	CO1: Know the characteristics of various components & Understand the utilization of components.
			CO2: Design and analyze small signal amplifier circuits.
			CO3: Learn Postulates of Boolean algebra and to minimize combinational functions.
			CO4: Design and analyze combinational logic circuits.
			CO5: Design and analyze sequential circuits & Know about the logic families and realization of logic gates.
2	II/I	DATA STRUCTURES	CO1: Ability to select the data structures that efficiently model the information in problem
			CO2: Ability to assess efficiency tradeoffs among different data structure implementations or combinations.
			CO3: Implement and know the application of algorithms for sorting and pattern matching.
			CO4: Design programs using variety of data structures including hash tables, binary and general tree structures, search trees
			CO5: Design programs using variety of data structures including trees, graphs and AVL trees
3	II/I	COMPUTER ORIENTED STATISTICAL METHODS	CO1: Apply the concepts of probability and distributions to some case studies
			CO2: Finding mean, variance, co-variance of random variables, and finding the probability using distributions
			CO3: Apply the Normal distribution concept to find the area under the normal curve
			CO4: Apply the concept of Hypothesis to test the given statement and application of central limit theorem
			CO5: Finding Markov chain of given matrix and Applications of stochastic process
4	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1: Understand the basics of instructions sets and their impact on processor design
			CO2: Demonstrate an understanding of the design of the functional units of a digital computer system
			CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards

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			CO5:Recognize and manipulate representations of numbers stored in digital computers
5	II/I	OBJECT ORIENTED PROGRAMMING USING C++	CO1:Understand about radar fundamentals and remember the radar ranges and parameters of general radar equation.
			CO2:Demonstrate the Doppler Effect and the concepts of continuous wave radars and the FM-CW Altimeter.
			CO3:Understand the operation of MTI radar and delay line cancellers.
			CO4:Remember the tracking radar systems and mono pulse radar.
			CO5:Analyze the detection of radar signals in noise and demonstrate the noise figure and radar receiver, Beam steering.
6	II/I	ANALOG AND DIGITAL ELECTRONICS LAB	CO1:Understand the utilization of components
			CO2:Design and analyze small signal amplifier circuits
			CO3:Postulates of Boolean algebra and to minimize combinational functions
			CO4:Design and analyze combinational and sequential circuits
			CO5:Known about the logic families and realization of logic gates
7	II/I	DATA STRUCTURES LAB	CO1:Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists
			CO2:Ability to Implement searching and sorting algorithms
			CO3:Various concepts of C programming languages
			CO4:Introduces searching and sorting algorithms
			CO5:It provides an understanding of data structures such as stacks and queues
8	II/I	IT WORKSHOP LAB	CO1:Identify the peripherals of a computer, components in a CPU and its functions
			CO2:Disassemble and assemble the PC back to working condition
			CO3:Install MS windows on the personal computer
			CO4:Install Linux on the computer
			CO5:Customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers
9	II/I	C++ PROGRAMMING LAB	CO1:Introduces object-oriented programming concepts using the C++ language
			CO2:Introduces the principles of data abstraction, inheritance and polymorphism
			CO3:Introduces the principles of virtual functions and polymorphism
			CO4:Introduces handling formatted I/O and unformatted I/O

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			CO5: Introduces exception handling
10	II/I	GENDER SENSITIZATION LAB	CO1: Students will have developed a better understanding of important issues related to gender in contemporary India.
			CO2: Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
			CO3: Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
			CO4: Students will acquire insight into the gendered division of labor and its relation to politics and economics.
			CO5: Men and women students and professionals will be better equipped to work and live together as equals.
11	II/II	DISCRETE MATHEMATICS	CO1: Ability to Understand and Construct Precise Mathematical Proofs
			CO2: Ability to Use Logic and Set Theory to Formulate precise Statements
			CO3: Ability to Analyze and Solve Counting Problems On Finite and Discrete Structures
			CO4: Ability to Describe and Manipulate Sequences
			CO5: Ability to Apply Graph Theory in Solving Computing Problems
12	II/II	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
			CO3: The Students can study the financial position by analyzing the Financial Statements of a company
			CO4: Ascertain the provisions of capital
			CO5: Enumerate the concept of capital budgeting and allocations of the resources through capital
13	II/II	OPERATING SYSTEMS	CO1: Will be able to control access to a computer and the files that may be shared.
			CO2: Demonstrate the knowledge of the components of computer and their respective roles in computing.
			CO3: Ability to recognize and resolve user problems with standard operating environments.
			CO4: Analyze the various device and resource management techniques for timesharing and distributed systems.
			CO5: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
14	II/II	DATABASE MANAGEMENT	CO1: To introduce DBMS and its applications.

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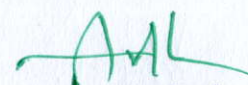
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		SYSTEMS	<p>CO2:To understand the students with formal foundation on relational model.</p> <p>CO3:To introduce the various systematic database design approaches.</p> <p>CO4:To introduce the concepts of transactions and recovery techniques.</p> <p>CO5:To explore the file organizations, indexing and hashing mechanisms.</p>
15	II/II	JAVA PROGRAMMING	<p>CO1:Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading</p> <p>CO2:Identify classes, abstract classes, objects, members</p> <p>CO3:Class and the Relationships among them needed for a specific problem.</p> <p>CO4:Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling multithreaded applications with Synchronization).</p> <p>CO5:Develop Applications for Range of Problems Using Object-Oriented Programming Techniques</p>
16	II/II	OPERATING SYSTEMS LAB (Using UNIX/LINUX)	<p>CO1:To provide an understanding of the design aspects of operating system concepts through simulation</p> <p>CO2:Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix</p> <p>CO3:Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.</p> <p>CO4:Able to implement C programs using Unix system calls</p> <p>CO5:Implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls</p>
17	II/II	DATABASE MANAGEMENT SYSTEMS LAB	<p>CO1:Introduce ER data model, database design and normalization</p> <p>CO2:Learn SQL basics for data definition and data manipulation</p> <p>CO3:Design database schema for a given application and apply normalization</p> <p>CO4:Acquire skills in using SQL commands for data definition and data manipulation</p> <p>CO5:Develop solutions for database applications using procedures, cursors and triggers</p>
18	II/II	JAVA PROGRAMMING LAB	<p>CO1:Able to write programs for solving real world problems using java collection frame work.</p> <p>CO2:Able to write programs using abstract classes.</p>

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			<p>CO3:Able to write multithreaded programs.</p> <p>CO4:Able to write GUI programs using swing controls in Java</p> <p>CO5:Impart hands on experience with java programming.</p>
19	II/II	CONSTITUTION OF INDIA	<p>CO1:Meaning of the constitution law and constitutionalism</p> <p>CO2:Historical perspective of the Constitution of India</p> <p>CO3:Salient features and characteristics of the Constitution of India</p> <p>CO4:Scheme of the fundamental rights</p> <p>CO5:The scheme of the Fundamental Duties and its legal status</p>
20	III/I	FORMAL LANGUAGES AND AUTOMATA THEORY	<p>CO1:Able to understand the concept of abstract machines and their power to recognize the languages.</p> <p>CO2:Able to employ finite state machines for modeling and solving computing problems.</p> <p>CO3:Able to design context free grammars for formal languages.</p> <p>CO4:Able to distinguish between decidability and undesirability.</p> <p>CO5:Able to gain proficiency with mathematical tools and formal methods.</p>
21	III/I	SOFTWARE ENGINEERING	<p>CO1:Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).</p> <p>CO2:Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.</p> <p>CO3:Will have experience and/or awareness of testing problems and will be able to develop a simple testing report</p> <p>CO4:Provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.</p> <p>CO5:Process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams</p>
22	III/I	COMPUTER NETWORKS	<p>CO1:Enables the students to visualize the different aspects of networks, Protocols and network design models.</p> <p>CO2:Enables the students to examine various Data Link layer design issues and Data Link protocols.</p> <p>CO3:Enables the students to analyze and compare different LAN protocols</p> <p>CO4:Enables the students to compare and select appropriate routing algorithms for a network .</p> <p>CO5:Enables the students to examine the important aspects and functions of Network layer, transport layer and</p>

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			application layer in internetworking.
23	III/I	WEB TECHNOLOGIES	CO1:Understand server-side scripting with PHP language
			CO2:Understand what is HTML, XML and how to parse and use XML Data with Java
			CO3:To introduce Server-side programming with Java Servlets
			CO4:To develop Server-side applications with JSP
			CO5:Gain knowledge of client-side scripting, validation of forms and AJAX programming
24	III/I	DATA ANALYTICS	CO1:Understand the impact of data analytics for business decisions and strategy
			CO2:Carryout data analysis/statistical analysis
			CO3:To carry out standard data visualization and formal inference procedures
			CO4:Design Data Architecture
			CO5:Understand various Data Sources
25	III/I	COMPUTER GRAPHICS	CO1:Acquire Familiarity with the relevant Mathematics of Computer Graphics.
			CO2:Be Able to Design Basic Application in 2D Viewing.
			CO3:Be Able to Design in 3D Object Representation.
			CO4:Be Able to Design in 3D Geometric Transformations and 3D Viewing.
			CO5:Be Able to Design Computer Animation and Applications that Display Graphics image to Given Specifications.
26	III/I	SOFTWARE ENGINEERING LAB	CO1:Ability to translate end-user requirements into system and software requirements
			CO2:Ability to generate a high-level design of the system from the software requirements
			CO3:Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO4:Experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.
			CO5:Preparation of Software Configuration Management and Risk Management related documents.
27	III/I	COMPUTER NETWORKS AND WEB TECHNOLOGIES LAB	CO1:Implement data link layer framing methods
			CO2:Analyze error detection and error correction codes
			CO3:Implement and analyze routing and congestion issues in network design
			CO4:Implement Encoding and Decoding techniques used in presentation layer
			CO5:To be able to work with different network tools
28	III/I	ADVANCED COMMUNICATION SKILLS	CO1:To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to

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		LAB	<p>English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts</p> <p>CO2:Further, they would be required to communicate their ideas relevantly and coherently in writing</p> <p>CO3:Gathering ideas and information to organize ideas relevantly and coherently</p> <p>CO4:Transferring information from non-verbal to verbal texts and vice-versa.</p> <p>CO5:To prepare all the students for their placements.</p>
29	III/I	INTELLECTUAL PROPERTY RIGHTS	<p>CO1:Introduction to Intellectual property</p> <p>CO2:Trade Marks</p> <p>CO3:Law of copy rights</p> <p>CO4:Trade Secrets</p> <p>CO5:New development of intellectual property</p>
30	III/II	MACHINE LEARNING	<p>CO1:Ability to solve Well-posed learning problems and Decision Tree Learning problems.</p> <p>CO2:Ability to get the skill to apply machine learning techniques such as Neural Networks and hypothesis problems.</p> <p>CO3:Ability to perform Bayesian learning and Computational learning problems.</p> <p>CO4:Ability to solve parallelizing genetic algorithms and relationship to dynamic programming.</p> <p>CO5:Ability to perform domain theories: PROLOG-EBG and inductive-analytical approaches.</p>
31	III/II	COMPILER DESIGN	<p>CO1:Ability to design, develop, and implement a compiler for any language</p> <p>CO2:Able to use LEX and YACC tools for developing a scanner and a parser</p> <p>CO3:Able to design and implement LL and LR parsers</p> <p>CO4:Able to design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity</p> <p>CO5:Ability to design algorithms to generate machine code</p>
32	III/II	DESIGN AND ANALYSIS OF ALGORITHMS	<p>CO1:Ability to analyze the performance of algorithms</p> <p>CO2:Ability to choose appropriate data structures</p> <p>CO3:Ability to algorithm design methods for a specified application</p> <p>CO4:Ability to understand how the choice of data structures</p> <p>CO5:Ability to algorithm design methods impact the performance of programs</p>
33	III/II	SOFTWARE TESTING METHODOLOGIES	<p>CO1:To provide knowledge of the concepts in software testing such as testing process, criteria, strategies and methodologies</p>

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			<p>CO2:To develop skills in software test automation and management using latest tools</p> <p>CO3:Design and develop the best test strategies in accordance to the development model</p> <p>CO4:To understand the Transaction Flow Testing</p> <p>CO5:Analyze Paths, Path products and Regular expressions</p>
34	III/II	FUNDAMENTALS OF INTERNET OF THINGS	<p>CO1:Known basic protocols in sensor networks.</p> <p>CO2:Program and configure arduino boards for various designs.</p> <p>CO3:Python programming and interfacing for Raspberry pi.</p> <p>CO4:Design IOT application in different domains.</p> <p>CO5:Understanding about data handling and analytics in SDN.</p>
35	III/II	MACHINE LEARNING LAB	<p>CO1:Understand complexity of Machine Learning algorithms and their limitations</p> <p>CO2:Understand modern notions in data analysis-oriented computing</p> <p>CO3:Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own</p> <p>CO4:Be capable of performing experiments in Machine Learning using real-world data</p> <p>CO5:Extract the data from database using python</p>
36	III/II	COMPILER DESIGN LAB	<p>CO1:To provide hands-on experience on web technologies</p> <p>CO2:To develop client-server application using web technologies</p> <p>CO3:To introduce server-side programming with Java servlets and JSP</p> <p>CO4:To understand the various phases in the design of a compiler</p> <p>CO5:To understand the design of top-down and bottom-up parsers</p>
37	III/II	SOFTWARE TESTING METHODOLOGIES LAB	<p>CO1:To provide knowledge of Software Testing Methods</p> <p>CO2:To develop skills in software test automation and management using latest tools</p> <p>CO3:Design and develop the best test strategies in accordance to the development model</p> <p>CO4:Recording in context sensitive mode and analog mode</p> <p>CO5:Silent mode test execution without any interruption</p>
38	III/II	ENVIRONMENTAL SCIENCE	<p>CO1:Understanding the importance of ecological balance for sustainable development.</p> <p>CO2:Understanding the impacts of developmental activities and mitigation measures</p> <p>CO3:Understanding the environmental policies and regulations</p> <p>CO4:Understand /evaluate / develop</p>

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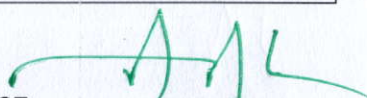
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			technologies on the basis of ecological principles CO5: Understand /evaluate / develop technologies on environmental regulations which in turn helps in sustainable development
39	IV/I	CRYPTOGRAPHY AND NETWORK SECURITY	CO1: Student will be able to understand basics of security services and model. CO2: Ability to perform the procedure of various symmetric and asymmetric algorithms. CO3: Ability to perform Key management issues and algorithms. CO4: Understand security issues in wireless and Web. CO5: Ability to analyze E-mail security services.
40	IV/I	DATA MINING	CO1: Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system. CO2: Apply preprocessing methods for any given raw data. CO3: Extract interesting patterns from large amounts of data. CO4: Discover the role played by data mining in various fields. CO5: Choose and employ suitable data mining algorithms to build analytical applications.
41	IV/I	CLOUD COMPUTING	CO1: Understand the concepts of computing paradigms. CO2: Ability to understand the concepts of cloud computing and Deployment Models. CO3: Ability to understand various services of a network connectivity and managing cloud. CO4: Understanding cloud service models. CO5: Understanding cloud service providers.
42	IV/I	SOFTWARE PROCESS & PROJECT MANAGEMENT	CO1: Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation CO2: Identify the different project contexts and suggest and appropriate management strategy CO3: Analyze the major and minor milestones, artifacts and metrics from management and technical CO4: Identify and describe the key phases of project management. CO5: Design and develop software product using conventional and modern principles of software
43	IV/I	PRINCIPLES OF ENTREPRENEURSHIP	CO1: Introduction to Entrepreneurship. CO2: Financing and Managing. CO3: Industrial Financial Support. CO4: Production and marketing management. CO5: Labour legislation.
44	IV/I	CRYPTOGRAPHY AND	CO1: To Understand Java program to perform encryption and

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		NETWORK SECURITY LAB	<p>decryption</p> <p>CO2:To formulate C/JAVA program to implement the DES algorithm logic.</p> <p>CO3:Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript</p> <p>CO4:Understand RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" using Blowfish</p> <p>CO5:C program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.</p>
45	IV/II	ORGANIZATIONAL BEHAVIOUR	<p>CO1:Provide the students with the conceptual framework and the theories underlying Organizational Behavior</p> <p>CO2:Understand Environmental and organizational context – Impact of IT, globalization</p> <p>CO3:Understand Personality and Attitudes</p> <p>CO4:Understand Meaning and types of power – empowerment</p> <p>CO5:Understand Job design and Goal setting for High performance</p>
46	IV/II	HUMAN COMPUTER INTERACTION	<p>CO1:Ability to apply HCI and principles to interaction design.</p> <p>CO2:Understand the concepts of Design Process.</p> <p>CO3:Understand Windows for Screen Based Devices and Icons.</p> <p>CO4:Understand the HCI in the software process.</p> <p>CO5:Understand the cognitive models</p>
47	IV/II	BASICS OF POWER PLANT ENGINEERING	<p>CO1:Over view of Thermal power plants.</p> <p>CO2:Over view of hydel power plants.</p> <p>CO3:Over view of nuclear power plants.</p> <p>CO4:Understand the importance of non-conventional power plants.</p> <p>CO5:Understand the importance of tariff.</p>

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**Department of Civil Engineering I & II Sem Course Outcomes For The Academic Year 2021-22
(Regulation - R18)**

Department of Civil Engineering I & II Sem Course Outcomes For The Academic Year 2021-22 (R18)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	SURVEYING AND GEOMATICS	<p>CO1:Apply the knowledge to calculate angles, distances and levels</p> <p>CO2:Identify data collection methods and prepare field notes</p> <p>CO3:Understand the working principles of survey instruments, measurement errors and corrective measures</p> <p>CO4:Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and methodologies</p> <p>CO5:Know the principle and methods of surveying.</p>
2	II/I	ENGINEERING GEOLOGY	<p>CO1:Understand Site characterization and how to collect, analyze and report geologic data using standards in engineering practice</p> <p>CO2:Understand The fundamentals of the engineering properties of Earth materials and fluids</p> <p>CO3:Understand Rock mass characterization and the mechanics of planar rock slides and topples</p> <p>CO4:To give the basics knowledge of Geology that is required for constructing various Civil Engineering Structures, basic Geology, Geological Hazardous and Environmental Geology</p> <p>CO5:To focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation.Planning and construction of major Civil Engineering projects</p>
3	II/I	STRENGTH OF MATERIALS – I	<p>CO1:Describe the concepts and principles, understand the theory of elasticity including strain/displacement and Hooke's law relationships; and perform calculations, related to the strength of structured and mechanical components.</p> <p>CO2:Recognize various types loads applied on structural components of simple framing geometries and understand the nature of internal stresses that will develop within the components.</p> <p>CO3:To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading</p> <p>CO4:Analyze various situations involving structural members subjected to plane stresses by application of Mohr's circle of stress</p> <p>CO5:Frame an idea to design a system, component, or process</p>
4	II/I	PROBABILITY AND STATISTICS	<p>CO1:Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.</p> <p>CO2:Understand the ideas of probability and random variables</p>



			and various discrete and continuous probability distributions and their properties.
			CO3: Understand the basic ideas of statistics including measures of central tendency, correlation and regression.
			CO4: Understand the statistical methods of studying data samples.
			CO5: Understand Continuous Random variable & Distribution
5	II/I	FLUID MECHANICS	CO1: Understand the broad principles of fluid statics, kinematics and dynamics
			CO2: Understand definitions of the basic terms used in fluid mechanics and characteristics of fluids and its flow
			CO3: Understand classifications of fluid flow
			CO4: Be able to apply the continuity, momentum and energy principles
			CO5: To prepare a student to build a good fundamental background useful in the application-intensive courses covering hydraulics, hydraulic machinery and hydrology
6	II/I	SURVEYING LAB	CO1: The student will be able to apply the principle of surveying for civil Engineering Applications
			CO2: Calculation of areas, Drawing plans and contour maps using different measuring equipment at field level
			CO3: The student will be able to write a technical laboratory report
			CO4: To impart the practical knowledge in the field- measuring distances, directions, angles
			CO5: To determining R.L.'s areas and volumes
7	II/I	STRENGTH OF MATERIALS LAB	CO1: The student will be able to Configure & Operate a data acquisition system using various testing machines of solid materials
			CO2: The student will be able to Compute and Analyze engineering values (e.g. stress or strain) from laboratory measurements.
			CO3: Students will be able to Write a technical laboratory report
			CO4: Students will be able to Make measurements of different strains, stress and elastic properties of materials used in Civil Engineering
			CO5: Students will be able to Introduce experimental procedures and common measurement instruments, equipment, devices
8	II/I	ENGINEERING GEOLOGY LAB	CO1: Understands the method and ways of investigations required for Civil Engg projects
			CO2: Students will be able to Identify the various rocks, minerals depending on geological classifications
			CO3: Will able to learn to couple geologic expertise with the



			<p>engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides and settlement.</p> <p>CO4:Students will be able to Write a technical laboratory report.</p> <p>CO5:Provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.</p>
9	II/I	CONSTITUTION OF INDIA	<p>CO1:Meaning of the constitution law and constitutionalism</p> <p>CO2:Historical perspective of the Constitution of India</p> <p>CO3:Salient features and characteristics of the Constitution of India</p> <p>CO4:Scheme of the fundamental rights</p> <p>CO5:The scheme of the Fundamental Duties and its legal status</p>
10	II/II	BASIC ELECTRICAL & ELECTRONICS ENGINEERING	<p>CO1:To analyze and solve electrical circuits using network laws and theorems.</p> <p>CO2:To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3:To study the working principles of Electrical Machines</p> <p>CO4:To introduce components of Low Voltage Electrical Installations</p> <p>CO5:To identify and characterize diodes and various types of transistors</p>
11	II/II	BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS	<p>CO1:To understand the mechanical equipment for the usage at civil engineering systems</p> <p>CO2:To familiarize with the general principles and requirement for refrigeration, manufacturing</p> <p>CO3:To realize the techniques employed to construct civil engineering systems</p> <p>CO4:Familiarize civil engineering students with the Basic machine elements</p> <p>CO5:Familiarize civil engineering students with the Power transmission elements, material handling equipment.</p>
12	II/I	BUILDING MATERIALS, CONSTRUCTION AND PLANNING	<p>CO1:Student should be able to define the Basic terminology that is used in the industry</p> <p>CO2:Students will be able to Categorize different building materials, properties and their uses</p> <p>CO3:Students will be able to Understand the Prevention of damage measures and good workmanship</p> <p>CO4:Students will be able to Understand the building bye-laws</p> <p>CO5:Students will be able to understand Importance of industrial relations</p>
13	II/II	STRENGTH OF	<p>CO1:Describe the concepts and principles, understand the</p>



		MATERIALS – II	<p>theory of elasticity, and perform calculations, relative to the strength of structures and mechanical components in particular to torsion and direct compression</p> <p>CO2:To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading</p> <p>CO3:Analyze strength and stability of structural members subjected to Direct, and Direct and Bending stresses</p> <p>CO4:Understand and evaluate the shear center and unsymmetrical bending</p> <p>CO5:Frame an idea to design a system, component, or process</p>
14	II/II	HYDRAULICS AND HYDRAULIC MACHINERY	<p>CO1:Apply their knowledge of fluid mechanics in addressing problems in open channels and hydraulic machinery.</p> <p>CO2:Understand and solve problems in uniform, gradually and rapidly varied flows in open channel in steady state conditions.</p> <p>CO3:Apply dimensional analysis and to differentiate the model, prototype and similitude conditions for practical problems.</p> <p>CO4:Get the knowledge on different hydraulic machinery devices and its principles that will be utilized in hydropower development and for other practical usages</p> <p>CO5:To Discuss and analyze the open channels in uniform and Non-uniform flow conditions.</p>
15	II/II	STRUCTURAL ANALYSIS – I	<p>CO1:An ability to apply knowledge of mathematics, science, and engineering</p> <p>CO2:Analyze the statically indeterminate bars and continuous beams</p> <p>CO3:Draw strength behavior of members for static and dynamic loading</p> <p>CO4:Calculate the stiffness parameters in beams and pin jointed trusses</p> <p>CO5:Understand the indeterminacy aspects to consider for a total structural system</p>
16	II/II	COMPUTER AIDED CIVIL ENGINEERING DRAWING	<p>CO1:Students will be able to understand Auto cad in various civil engineering applications, especially in building drawing</p> <p>CO2:Students will be able to understand basic drawing fundamentals in various civil engineering applications, especially in building drawing</p> <p>CO3:Students will be able to understand the AutoCAD commands for drawing 2D & 3D building drawings required for different civil engineering applications</p> <p>CO4:Students will be able to understand Plan and draw Civil Engineering Buildings as per aspect and orientation</p> <p>CO5:Students will be able to understand Presenting drawings as per user requirements and preparation of technical report</p>



17	II/II	HYDRAULICS & HYDRAULIC MACHINERY LAB	CO1: Describe the basic measurement techniques of fluid mechanics and its appropriate application.
			CO2: Interpret the results obtained in the laboratory for various experiments.
			CO3: Discover the practical working of Hydraulic machines-different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
			CO4: Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.
			CO5: Students will be able to identify the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
18	II/II	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB	CO1: Students will be able to analyze and solve electrical circuits using network laws and theorems.
			CO2: Students will be able to understand and analyze basic Electric and Magnetic circuits
			CO3: Students will be able to study the working principles of Electrical Machines
			CO4: Students will be able to identify and characterize diodes and various types of transistors
			CO5: Students will be able to understand Identify different types of investment decisions
19	II/II	GENDER SENSITIZATION LAB	CO1: To develop students' sensibility with regard to issues of gender in contemporary India.
			CO2: To provide a critical perspective on the socialization of men and women.
			CO3: To introduce students to information about some key biological aspects of genders.
			CO4: To expose the students to debates on the politics and economics of work.
			CO5: To help students reflect critically on gender violence.
20	III/I	STRUCTURAL ANALYSIS - II	CO1: Students will be able to analyze the two hinged arches.
			CO2: Students will be able to solve statically indeterminate beams and portal frames using classical methods
			CO3: Students will be able to sketch the shear force and bending moment diagrams for indeterminate structures.
			CO4: Students will be able to formulate the stiffness matrix and analyze the beams by matrix methods
			CO5: Students will be able to understand classical methods of analysis for statically indeterminate structures.
21	III/I	GEOTECHNICAL ENGINEERING	CO1: Students will be able to characterize and classify the soils
			CO2: Students will be able to estimate seepage, stresses under various loading conditions and compaction characteristics
			CO3: Students will be able to analyze the compressibility of the



			soils CO4: Students will be able to understand the strength of soils under various drainage conditions CO5: Students will be able to understand the formation of soil and classification of the soils
22	III/I	STRUCTURAL ENGINEERING – I	CO1: Students will be able to compare and design the singly reinforced, doubly reinforced and flanged sections. CO2: Students will be able to Design the axially loaded, uni axial and biaxial bending columns. CO3: Students will be able to Classify the footings and Design the isolated square, rectangular and circular footings CO4: Students will be able to Distinguish and Design the one-way and two-way slabs CO5: Students will be able to identify the basic components of any structural system and the standard loading for the RC structure
23	III/I	TRANSPORTATION ENGINEERING	CO1: An ability to apply the knowledge of mathematics, science and engineering in the areas of traffic engineering, highway development and maintenance. CO2: Ability to design, conduct experiments to assess the suitability of the highway materials like soil, bitumen, aggregates and a variety of bituminous mixtures. Also the students will develop the ability to interpret the results and assess the suitability of these materials for construction of highways. CO3: Ability to design flexible and rigid highway pavements for varying traffic compositions as well as soil sub grade and environmental conditions using the standards stipulated by Indian Roads Congress. CO4: Ability to evaluate the structural and functional conditions of in-service highway pavements and provide solution in the form of routine maintenance measures or designed overlays using Indian Roads congress guidelines. CO5: Ability to assess the issues related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioral patterns.
24	III/I	CONCRETE TECHNOLOGY	CO1: Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests. Recognize the effects of the rheology and early age properties of concrete on its long-term behavior. CO2: Apply the use of various chemical admixtures and mineral additives to design cement-based materials with tailor-made properties CO3: Use advanced laboratory techniques to characterize



			<p>cement-based materials.</p> <p>CO4: Perform mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, and fibre reinforced concrete.</p> <p>CO5: Understand Design economic concrete mix proportion for different exposure conditions and intended purposes.</p>
25	III/I	ENGINEERING ECONOMICS AND ACCOUNTANCY	<p>CO1: To perform and evaluate present and future worth of the alternate projects</p> <p>CO2: To appraise projects by using traditional and DCF Methods</p> <p>CO3: To carry out cost benefit analysis of projects</p> <p>CO4: To calculate BEP of different alternative projects.</p> <p>CO5: To prepare engineering students to analyze cost/ revenue/ financial data</p>
26	III/I	HIGHWAY ENGINEERING & CONCRETE TECHNOLOGY LAB	<p>CO1: Categorize the test on materials used Civil Engineering Building & Pavement constructions.</p> <p>CO2: To perform the tests on concrete for it characterization.</p> <p>CO3: To Design Concrete Mix Proportioning by Using Indian Standard Method.</p> <p>CO4: Examine the tests performed for Bitumen mixes.</p> <p>CO5: To prepare a laboratory report</p>
27	III/I	GEOTECHNICAL ENGINEERING LAB	<p>CO1: The student will be able to Classify and evaluate the behavior of the soils subjected to various loads.</p> <p>CO2: To obtain index and engineering properties of locally available soils, and to understand the behavior of these soil under various loads</p> <p>CO3: Determination of Specific gravity of soil Grain size distribution by sieve analysis</p> <p>CO4: Learn the Permeability of soil by constant and variable head test methods</p> <p>CO5: Determination of Coefficient of consolidation (square root time fitting method)</p>
28	III/I	ADVANCE COMMUNICATION SKILLS LAB	<p>CO1: To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts</p> <p>CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.</p> <p>CO3: To prepare all the students for their placements</p> <p>CO4: Gathering ideas and information to organize ideas relevantly and coherently.</p> <p>CO5: Transferring information from non-verbal to verbal texts and vice-versa.</p>
29	III/I	INTELLECTUAL	CO1: Introduction to Intellectual property

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		PROPERTY RIGHTS	<p>CO2:Trade Marks</p> <p>CO3:Law of copy rights</p> <p>CO4:Trade Secrets</p> <p>CO5:New development of intellectual property</p>
30	III/II	HYDROLOGY AND WATER RESOURCES ENGINEERING	<p>CO1:Understand the different concepts and terms used in engineering hydrology</p> <p>CO2:To identify and explain various formulae used in estimation of surface and Ground water hydrology components</p> <p>CO3:Demonstrate their knowledge to connect hydrology to the field requirement</p> <p>CO4:Provides the description of hydrological cycle and derive various formulas used in estimation of different basic components of surface and Ground water cycle and its components.</p> <p>CO5:Understand the water requirement for irrigation and connectivity of hydrology to the field requirement.</p>
31	III/II	ENVIRONMENTAL ENGINEERING	<p>CO1:Assess characteristics of water and wastewater and their impacts</p> <p>CO2:Estimate quantities of water and waste water and plan conveyance components</p> <p>CO3:Design components of water and waste water treatment plants</p> <p>CO4:Be conversant with issues of air pollution and control</p> <p>CO5:Provides the knowledge of water sources, water treatment, design of distribution system waste water treatment, and safe disposal methods</p>
32	III/II	FOUNDATION ENGINEERING	<p>CO1:Understand the principles and methods of Geotechnical Exploration</p> <p>CO2:Decide the suitability of soils and check the stability of slopes</p> <p>CO3:Calculate lateral earth pressures and check the stability of retaining walls</p> <p>CO4:Analyse and design the shallow and deep foundations</p> <p>CO5:To Plan Soil exploration programme for civil Engineering Projects</p>
33	III/II	STRUCTURAL ENGINEERING – II	<p>CO1:Analyze the tension members, compression members.</p> <p>CO2:Analyze and Design the beams including built-up sections and beam and connections.</p> <p>CO3:Design the tension members, compression members and column bases and joints and connections</p> <p>CO4:Identify and Design the various components of welded plate girder including stiffeners</p> <p>CO5:Analyze the behavior of steel structures under tension, compression and flexure.</p>

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34	III/II	PRESTRESSED CONCRETE	CO1:Acquire the knowledge of evolution of process of prestressing.
			CO2:Acquire the knowledge of various prestressing techniques.
			CO3:Develop skills in analysis design of prestressed structural elements as per the IS codal provisions
			CO4:Understand the principles & necessity of prestressed concrete structures.
			CO5:Understand Analysis and design of prestressed concrete members.
35	III/II	FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS	CO1:The students understand different concepts of management in all aspects.
			CO2:To know the scope and importance of leadership qualities and skills.
			CO3:Student understand the importance of Motivation, Power, Authority flow in the organization.
			CO4:To explore student in all the studies of Management and theories of Management.
			CO5:Students learn the importance of planning and organizing theories in depth.
36	III/II	ENVIRONMENTAL ENGINEERING LAB	CO1:Understand about the equipment used to conduct the test procedures
			CO2:Perform the experiments in the lab
			CO3:Examine and Estimate water, waste water, air and soil Quality
			CO4:Compare the water, air quality standards with prescribed standards set by the local governments
			CO5:Develop a report on the quality aspect of the environment
37	III/II	COMPUTER AIDED DESIGN LAB	CO1:Model the geometry of real-world structure Represent the physical model of structural element/structure
			CO2:Perform analysis
			CO3:Interpret from the Post processing results
			CO4:Design the structural elements and a system as per IS Codes
			CO5:Analyze and Interpret the results using post processor
38	III/II	ENVIRONMENTAL SCIENCE	CO1:Understanding the importance of ecological balance for sustainable development.
			CO2:Understanding the impacts of developmental activities and mitigation measures
			CO3:Understanding the environmental policies and regulations
			CO4:Understand /evaluate / develop technologies on the basis of ecological principles
			CO5:Understand /evaluate / develop technologies on

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			environmental regulations which in turn helps in sustainable development
39	IV/I	ESTIMATION, COSTING AND PROJECT MANAGEMENT	<p>CO1:Understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure.</p> <p>CO2:Quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure.</p> <p>CO3:An idea of how to optimize construction projects based on costs</p> <p>CO4:An idea how construction projects are administered with respect to contract structures and issues.</p> <p>CO5:An ability to put forward ideas and understandings to others with effective communication processes</p>
40	IV/I	GROUND IMPROVEMENT TECHNIQUES	<p>CO1:Know the necessity of ground improvement</p> <p>CO2:Understand the various ground improvement techniques available</p> <p>CO3:Select & design suitable ground improvement technique for existing soil conditions in the field</p> <p>CO4:To acquire the knowledge on the various ground improvement techniques available and their applications for different types of soils</p> <p>CO5:To understand suitable ground improvement technique for given soil conditions</p>
41	IV/I	GROUND WATER HYDROLOGY	<p>CO1:Identify different fundamental equations and concepts as applied in the Groundwater studies</p> <p>CO2:Discuss and derive differential equation governing groundwater flow in three dimensions</p> <p>CO3:To solve groundwater mathematical equations and analyze pumping tests in steady and nonsteady flow cases</p> <p>CO4:Distinguish and understand the saline water intrusion problem in costal aquifers</p> <p>CO5:To demonstrate and derive the basic equations used in Groundwater development and management and the corresponding equations</p>
42	IV/I	BASIC MECHANICAL ENGINEERING	<p>CO1:To gain an understanding of the basic concepts of various aspects of Mechanical Engineering, fields of application, their merits, demerits, and limitations and applications.</p> <p>CO2:Understand the Basic Concepts of Thermodynamics and Heat Transfer</p> <p>CO3:Understand the Basic Concepts of IC Engines and Air Conditioning</p> <p>CO4:Understand the Basic Concepts of Power Transmission</p> <p>CO5:Understand the Basic Concepts of Kinematics of Machines</p>



43	IV/I	PROFESSIONAL PRACTICE, LAW & ETHICS	CO1: To make the students understand the types of roles they are expected to play in the society as practitioners of the civil engineering profession
			CO2: To develop some ideas of the legal and practical aspects of their profession.
			CO3: Understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
			CO4: The students will learn the rights and responsibilities as an employee, team member and a global citizen.
			CO5: Engagement of Labour and Labour & other construction-related Laws.
44	IV/II	SOLID WASTE MANAGEMENT	CO1: Identify the physical and chemical composition of solid wastes
			CO2: Analyze the functional elements for solid waste management.
			CO3: Understand the techniques and methods used in transformation, conservation, and recovery of materials from solid wastes.
			CO4: Identify and design waste disposal systems
			CO5: Define the terms and Understands the necessity of solid waste management
45	IV/II	AIRPORT, RAILWAYS, AND WATERWAYS	CO1: The students will develop an ability to design of runways and taxiways.
			CO2: The students will develop an an ability to design the infrastructure for large and small airports
			CO3: The students will develop an an ability to design various crossings and signals in Railway Projects
			CO4: The students will develop an an ability plan the harbors and ports projects including the infrastructure required for new ports and harbors.
			CO5: Introduce component of railway tracks, train resistance, crossing, signaling, high speed tracks and Metro Rail.
46	IV/II	BASICS OF POWER PLANT ENGINEERING	CO1: Over view of Thermal power plants.
			CO2: Over view of hydel power plants.
			CO3: Over view of nuclear power plants.
			CO4: Understand the importance of non-conventional power plants.
			CO5: Understand the importance of tariff.



Department of Artificial Intelligence and Machine Learning I & II Sem Course Outcomes
For The Academic Year 2022-23 (Regulation - R22)

Department of Artificial Intelligence and Machine Learning I & II Sem Course Outcomes For The Academic Year 2022-23 (R22)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	I/I	MATRICES AND CALCULUS	CO1:Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
			CO2:Find the Eigen values and Eigen vectors
			CO3:Reduce the quadratic form to canonical form using orthogonal transformations.
			CO4:Solve the applications on the mean value theorems.
			CO5:Evaluate the improper integrals using Beta and Gamma functions
2	I/I	APPLIED PHYSICS	CO1:Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
			CO2:Identify the role of semiconductor devices in science and engineering Applications.
			CO3:Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
			CO4:Appreciate the features and applications of Nanomaterials.
			CO5:Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.
3	I/I	PROGRAMMING FOR PROBLEM SOLVING	CO1:To write algorithms and to draw flowcharts for solving problems.
			CO2:To convert the algorithms/flowcharts to C programs.
			CO3:To code and test a given logic in the C programming language.
			CO4:To decompose a problem into functions and to develop modular reusable code.
			CO5:To use arrays, pointers, strings and structures to write C programs.
4	I/I	ENGINEERING WORKSHOP	CO1:Student will be able to Study and practice on machine tools and their operations
			CO2:Student will be able to Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
			CO3:Student will be able to Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
			CO4:Student will be able to Apply basic electrical

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			<p>engineering knowledge for house wiring practice.</p> <p>CO5: Student will be able to develop a right attitude, team working, precision and safety at work place.</p>
5	I/I	ENGLISH FOR SKILL ENHANCEMENT	<p>CO1: Understand the importance of vocabulary and sentence structures.</p> <p>CO2: Choose appropriate vocabulary and sentence structures for their oral and written communication.</p> <p>CO3: Demonstrate their understanding of the rules of functional grammar.</p> <p>CO4: Develop comprehension skills from the known and unknown passages.</p> <p>CO5: Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.</p>
6	I/I	ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING	<p>CO1: Know the working principles of functional units of a basic Computer</p> <p>CO2: Understand program development, the use of data structures and algorithms in problem solving.</p> <p>CO3: Know the need and types of operating system, database systems.</p> <p>CO4: Understand the significance of networks, internet, WWW and cyber security.</p> <p>CO5: Understand Autonomous systems, the application of artificial intelligence.</p>
7	I/I	APPLIED PHYSICS LABORATORY	<p>CO1: Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.</p> <p>CO2: Appreciate quantum physics in semiconductor devices and optoelectronics.</p> <p>CO3: Gain the knowledge of applications of dielectric constant.</p> <p>CO4: Understand the variation of magnetic field and behavior of hysteresis curve.</p> <p>CO5: Carried out data analysis.</p>
8	I/I	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	<p>CO1: Formulate the algorithms for simple problems</p> <p>CO2: Translate given algorithms to a working and correct program</p> <p>CO3: Identify and correct logical errors encountered during execution</p> <p>CO4: Correct syntax errors as reported by the compilers</p> <p>CO5: Represent and manipulate data with arrays, strings and structures</p>
9	I/I	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY	<p>CO1: Understand the nuances of English language through audio- visual experience and group activities</p> <p>CO2: Students will Neutralize their accent for intelligibility</p> <p>CO3: Students will Speak with clarity and confidence which in</p>

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			turn enhances their employability skills
			CO4: To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
			CO5: To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
10	I/II	ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS	CO1: Identify whether the given differential equation of first order is exact or not
			CO2: Use the Laplace transforms techniques for solving ODE's.
			CO3: Solve higher differential equation and apply the concept of differential equation to real world problems.
			CO4: Evaluate the line, surface and volume integrals and converting them from one to another
			CO5: To learn Methods of solving the differential equations of first and higher order.
11	I/II	ENGINEERING CHEMISTRY	CO1: Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
			CO2: The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
			CO3: Students will learn the fundamentals and general properties of polymers and other engineering materials.
			CO4: Students can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
			CO5: To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
12	I/II	COMPUTER AIDED ENGINEERING GRAPHICS	CO1: Apply computer aided drafting tools to create 2D and 3D objects
			CO2: Appreciate the need of Sectional views of solids and Development of surfaces of solids
			CO3: Read and interpret engineering drawings
			CO4: Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
			CO5: Sketch conics and different types of solids
13	I/II	BASIC ELECTRICAL ENGINEERING	CO1: Understand and analyze basic Electrical circuits
			CO2: Study the working principles of Electrical Machines and Transformers
			CO3: Introduce components of Low Voltage Electrical Installations
			CO4: To understand DC and Single & Three phase AC circuits
			CO5: To study and understand the different types of DC, AC

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			machines and Transformers.
14	I/II	ELECTRONIC DEVICES AND CIRCUITS	CO1: Acquire the knowledge of various electronic devices and their use on real life.
			CO2: Know the applications of various devices.
			CO3: Acquire the knowledge about the role of special purpose devices and their applications.
			CO4: To introduce components such as diodes, BJTs and FETs.
			CO5: To know the applications of devices.
15	I/II	ENGINEERING CHEMISTRY LABORATORY	CO1: Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions.
			CO2: Able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases.
			CO3: Students are able to prepare polymers like bakelite and nylon-6.
			CO4: Estimations saponification value, surface tension and viscosity of lubricant oils.
			CO5: Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.
16	I/II	BASIC ELECTRICAL ENGINEERING LABORATORY	CO1: Verify the basic Electrical circuits through different experiments.
			CO2: Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
			CO3: Analyze the transient responses of R, L and C circuits for different input conditions.
			CO4: To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
			CO5: To study the transient response of various R, L and C circuits using different excitations.
17	I/II	PYTHON PROGRAMMING LABORATORY	CO1: Develop the application specific codes using python.
			CO2: Understand Strings, Lists, Tuples and Dictionaries in Python
			CO3: Verify programs using modular approach, file I/O, Python standard library
			CO4: Implement Digital Systems using Python
			CO5: To install and run the Python interpreter
18	I/II	IT WORKSHOP	CO1: Perform Hardware troubleshooting
			CO2: Understand Hardware components and inter dependencies
			CO3: Safeguard computer systems from viruses/worms
			CO4: Document/ Presentation preparation
			CO5: Perform calculations using spreadsheets



19	II/I	DISCRETE MATHEMATICS	CO1: Understand and construct precise mathematical proofs
			CO2: Apply logic and set theory to formulate precise statements
			CO3: Analyze and solve counting problems on finite and discrete structures
			CO4: Describe and manipulate sequences
			CO5: Apply graph theory in solving computing problems
20	II/I	DATA STRUCTURES	CO1: Ability to select the data structures that efficiently model the information in a problem.
			CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			CO3: Implement and know the application of algorithms for sorting and pattern matching.
			CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
			CO5: Exploring basic data structures such as stacks and queues
21	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1: Understand the basics of instruction sets and their impact on processor design.
			CO2: Demonstrate an understanding of the design of the functional units of a digital computer system.
			CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5: Recognize and manipulate representations of numbers stored in digital computers
22	II/I	SOFTWARE ENGINEERING	CO1: Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
			CO2: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO4: Provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
			CO5: Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

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23	II/I	OPERATING SYSTEMS	CO1: Will be able to control access to a computer and the files that may be shared
			CO2: Demonstrate the knowledge of the components of computers and their respective roles in computing.
			CO3: Ability to recognize and resolve user problems with standard operating environments.
			CO4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
			CO5: Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
24	II/I	DATA STRUCTURES LAB	CO1: It covers various concepts of C programming language
			CO2: Introduces searching and sorting algorithms
			CO3: It provides an understanding of data structures such as stacks and queues.
			CO4: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
			CO5: Ability to implement searching and sorting algorithms
25	II/I	OPERATING SYSTEMS LAB	CO1: To provide an understanding of the design aspects of operating system concepts through simulation
			CO2: Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix
			CO3: Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
			CO4: Able to implement C programs using Unix system calls
			CO5: Write a C program to implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls.
26	II/I	SOFTWARE ENGINEERING LAB	CO1: To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.
			CO2: Ability to translate end-user requirements into system and software requirements
			CO3: Ability to generate a high-level design of the system from the software requirements
			CO4: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO5: Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.

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27	II/I	CONSTITUTION OF INDIA	CO1:To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.
			CO2:Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
			CO3:Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
			CO4:Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
			CO5:Discuss the passage of the Hindu Code Bill of 1956
28	II/II	MATHEMATICAL AND STATISTICAL FOUNDATIONS	CO1:The student must be able to Apply the Stochastic process and Markov chains.
			CO2:The student must be able to Apply the number theory concepts to cryptography domain
			CO3:Apply the concepts of probability and distributions to some case studies
			CO4:Correlate the material of one unit to the material in other units
			CO5:Resolve the potential misconceptions and hazards in each topic of study.
29	II/II	AUTOMATA THEORY AND COMPILER DESIGN	CO1:Able to employ finite state machines for modeling and solving computing problems.
			CO2:Able to design context free grammars for formal languages.
			CO3:Able to distinguish between decidability and undecidability.
			CO4:Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
			CO5:Acquire skills in using lex tool and design LR parsers
30	II/II	DATABASE MANAGEMENT SYSTEMS	CO1:Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.
			CO2:Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO3:Master the basics of SQL for retrieval and management of data.
			CO4:Be acquainted with the basics of transaction processing and concurrency control.
			CO5:Familiarity with database storage structures and access technique

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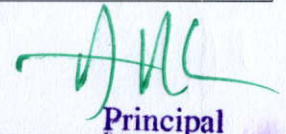
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31	II/II	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	CO1: Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
			CO2: Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
			CO3: Learn different knowledge representation techniques.
			CO4: Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
			CO5: Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
32	II/II	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	CO1: Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
			CO2: Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
			CO3: Use multithreading concepts to develop inter process communication.
			CO4: Understand the process of graphical user interface design and implementation using AWT or swings.
			CO5: Develop applets that interact abundantly with the client environment and deploy on the server.
33	II/II	DATABASE MANAGEMENT SYSTEMS LAB	CO1: Introduce ER data model, database design and normalization
			CO2: Learn SQL basics for data definition and data manipulation
			CO3: Design database schema for a given application and apply normalization
			CO4: Acquire skills in using SQL commands for data definition and data manipulation.
			CO5: Develop solutions for database applications using procedures, cursors and triggers
34	II/II	JAVA PROGRAMMING LAB	CO1: To understand swing controls in Java
			CO2: Able to write the programs for solving real world problems using Java OOP principles.
			CO3: Able to write programs using Exceptional Handling approach.
			CO4: Able to write multithreaded applications.
			CO5: Able to write GUI programs using swing controls in Java.
35	II/II	GENDER SENSITIZATION LAB	CO1: Students will have developed a better understanding of important issues related to gender in contemporary India.
			CO2: Students will be sensitized to basic dimensions of the

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			<p>biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p>
			<p>CO3:Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p>
			<p>CO4:Students will acquire insight into the gendered division of labor and its relation to politics and economics.</p>
			<p>CO5:Students will develop a sense of appreciation of women in all walks of life.</p>


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Department of Computer Science and Engineering (AIML) I & II Sem Course Outcomes for The Academic Year 2022-23 (Regulation – R22)

Department of Computer Science and Engineering (AIML) I & II Sem Course Outcomes for The Academic Year 2022-23 (Regulation – R22)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	I/I	MATRICES AND CALCULUS	CO1:Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
			CO2:Find the Eigen values and Eigen vectors
			CO3:Reduce the quadratic form to canonical form using orthogonal transformations.
			CO4:Solve the applications on the mean value theorems.
			CO5:Evaluate the improper integrals using Beta and Gamma functions
2	I/I	APPLIED PHYSICS	CO1:Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
			CO2:Identify the role of semiconductor devices in science and engineering Applications.
			CO3:Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
			CO4:Appreciate the features and applications of Nanomaterials.
			CO5:Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.
3	I/I	PROGRAMMING FOR PROBLEM SOLVING	CO1:To write algorithms and to draw flowcharts for solving problems.
			CO2:To convert the algorithms/flowcharts to C programs.
			CO3:To code and test a given logic in the C programming language.
			CO4:To decompose a problem into functions and to develop modular reusable code.
			CO5:To use arrays, pointers, strings and structures to write C programs.
4	I/I	ENGINEERING WORKSHOP	CO1:Student will be able to Study and practice on machine tools and their operations
			CO2:Student will be able to Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
			CO3:Student will be able to Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
			CO4:Student will be able to Apply basic electrical

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			<p>engineering knowledge for house wiring practice.</p> <p>CO5: Student will be able to develop a right attitude, team working, precision and safety at work place.</p>
5	I/I	ENGLISH FOR SKILL ENHANCEMENT	<p>CO1: Understand the importance of vocabulary and sentence structures.</p> <p>CO2: Choose appropriate vocabulary and sentence structures for their oral and written communication.</p> <p>CO3: Demonstrate their understanding of the rules of functional grammar.</p> <p>CO4: Develop comprehension skills from the known and unknown passages.</p> <p>CO5: Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.</p>
6	I/I	ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING	<p>CO1: Know the working principles of functional units of a basic Computer</p> <p>CO2: Understand program development, the use of data structures and algorithms in problem solving.</p> <p>CO3: Know the need and types of operating system, database systems.</p> <p>CO4: Understand the significance of networks, internet, WWW and cyber security.</p> <p>CO5: Understand Autonomous systems, the application of artificial intelligence.</p>
7	I/I	APPLIED PHYSICS LABORATORY	<p>CO1: Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.</p> <p>CO2: Appreciate quantum physics in semiconductor devices and optoelectronics.</p> <p>CO3: Gain the knowledge of applications of dielectric constant.</p> <p>CO4: Understand the variation of magnetic field and behavior of hysteresis curve.</p> <p>CO5: Carried out data analysis.</p>
8	I/I	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	<p>CO1: Formulate the algorithms for simple problems</p> <p>CO2: Translate given algorithms to a working and correct program</p> <p>CO3: Identify and correct logical errors encountered during execution</p> <p>CO4: Correct syntax errors as reported by the compilers</p> <p>CO5: Represent and manipulate data with arrays, strings and structures</p>
9	I/I	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY	<p>CO1: Understand the nuances of English language through audio-visual experience and group activities</p> <p>CO2: Students will Neutralize their accent for intelligibility</p> <p>CO3: Students will Speak with clarity and confidence which in</p>

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			turn enhances their employability skills
			CO4: To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
			CO5: To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
10	I/II	ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS	CO1: Identify whether the given differential equation of first order is exact or not
			CO2: Use the Laplace transforms techniques for solving ODE's.
			CO3: Solve higher differential equation and apply the concept of differential equation to real world problems.
			CO4: Evaluate the line, surface and volume integrals and converting them from one to another
			CO5: To learn Methods of solving the differential equations of first and higher order.
11	I/II	ENGINEERING CHEMISTRY	CO1: Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
			CO2: The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
			CO3: Students will learn the fundamentals and general properties of polymers and other engineering materials.
			CO4: Students can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
			CO5: To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
12	I/II	COMPUTER AIDED ENGINEERING GRAPHICS	CO1: Apply computer aided drafting tools to create 2D and 3D objects
			CO2: Appreciate the need of Sectional views of solids and Development of surfaces of solids
			CO3: Read and interpret engineering drawings
			CO4: Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
			CO5: Sketch conics and different types of solids
13	I/II	BASIC ELECTRICAL ENGINEERING	CO1: Understand and analyze basic Electrical circuits
			CO2: Study the working principles of Electrical Machines and Transformers
			CO3: Introduce components of Low Voltage Electrical Installations
			CO4: To understand DC and Single & Three phase AC circuits
			CO5: To study and understand the different types of DC, AC

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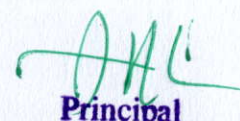
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			machines and Transformers.
14	I/II	ELECTRONIC DEVICES AND CIRCUITS	CO1: Acquire the knowledge of various electronic devices and their use on real life.
			CO2: Know the applications of various devices.
			CO3: Acquire the knowledge about the role of special purpose devices and their applications.
			CO4: To introduce components such as diodes, BJTs and FETs.
			CO5: To know the applications of devices.
15	I/II	ENGINEERING CHEMISTRY LABORATORY	CO1: Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions.
			CO2: Able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases.
			CO3: Students are able to prepare polymers like bakelite and nylon-6.
			CO4: Estimations saponification value, surface tension and viscosity of lubricant oils.
			CO5: Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.
16	I/II	BASIC ELECTRICAL ENGINEERING LABORATORY	CO1: Verify the basic Electrical circuits through different experiments.
			CO2: Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
			CO3: Analyze the transient responses of R, L and C circuits for different input conditions.
			CO4: To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
			CO5: To study the transient response of various R, L and C circuits using different excitations.
17	I/II	PYTHON PROGRAMMING LABORATORY	CO1: Develop the application specific codes using python.
			CO2: Understand Strings, Lists, Tuples and Dictionaries in Python
			CO3: Verify programs using modular approach, file I/O, Python standard library
			CO4: Implement Digital Systems using Python
			CO5: To install and run the Python interpreter
18	I/II	IT WORKSHOP	CO1: Perform Hardware troubleshooting
			CO2: Understand Hardware components and inter dependencies
			CO3: Safeguard computer systems from viruses/worms
			CO4: Document/ Presentation preparation
			CO5: Perform calculations using spreadsheets

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19	II/I	DISCRETE MATHEMATICS	CO1:Understand and construct precise mathematical proofs
			CO2:Apply logic and set theory to formulate precise statements
			CO3:Analyze and solve counting problems on finite and discrete structures
			CO4:Describe and manipulate sequences
			CO5:Apply graph theory in solving computing problems
20	II/I	DATA STRUCTURES	CO1:Ability to select the data structures that efficiently model the information in a problem.
			CO2:Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			CO3:Implement and know the application of algorithms for sorting and pattern matching.
			CO4:Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
			CO5:Exploring basic data structures such as stacks and queues
21	II/I	COMPUTER ORGANIZATION AND ARCHITECTURE	CO1:Understand the basics of instruction sets and their impact on processor design.
			CO2:Demonstrate an understanding of the design of the functional units of a digital computer system.
			CO3:Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			CO4:Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5:Recognize and manipulate representations of numbers stored in digital computers
22	II/I	SOFTWARE ENGINEERING	CO1:Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
			CO2:Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			CO3:Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO4:Provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
			CO5:Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

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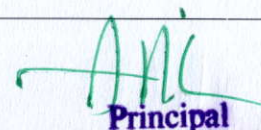
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23	II/I	OPERATING SYSTEMS	CO1: Will be able to control access to a computer and the files that may be shared
			CO2: Demonstrate the knowledge of the components of computers and their respective roles in computing.
			CO3: Ability to recognize and resolve user problems with standard operating environments.
			CO4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
			CO5: Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
24	II/I	DATA STRUCTURES LAB	CO1: It covers various concepts of C programming language
			CO2: Introduces searching and sorting algorithms
			CO3: It provides an understanding of data structures such as stacks and queues.
			CO4: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
			CO5: Ability to implement searching and sorting algorithms
25	II/I	OPERATING SYSTEMS LAB	CO1: To provide an understanding of the design aspects of operating system concepts through simulation
			CO2: Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix
			CO3: Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
			CO4: Able to implement C programs using Unix system calls
			CO5: Write a C program to implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls.
26	II/I	SOFTWARE ENGINEERING LAB	CO1: To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.
			CO2: Ability to translate end-user requirements into system and software requirements
			CO3: Ability to generate a high-level design of the system from the software requirements
			CO4: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO5: Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.

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27	II/I	CONSTITUTION OF INDIA	CO1:To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.
			CO2:Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
			CO3:Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
			CO4:Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
			CO5:Discuss the passage of the Hindu Code Bill of 1956
28	II/II	MATHEMATICAL AND STATISTICAL FOUNDATIONS	CO1:The student must be able to Apply the Stochastic process and Markov chains.
			CO2:The student must be able to Apply the number theory concepts to cryptography domain
			CO3:Apply the concepts of probability and distributions to some case studies
			CO4:Correlate the material of one unit to the material in other units
			CO5:Resolve the potential misconceptions and hazards in each topic of study.
29	II/II	AUTOMATA THEORY AND COMPILER DESIGN	CO1:Able to employ finite state machines for modeling and solving computing problems.
			CO2:Able to design context free grammars for formal languages.
			CO3:Able to distinguish between decidability and undecidability.
			CO4:Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
			CO5:Acquire skills in using lex tool and design LR parsers
30	II/II	DATABASE MANAGEMENT SYSTEMS	CO1:Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.
			CO2:Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO3:Master the basics of SQL for retrieval and management of data.
			CO4:Be acquainted with the basics of transaction processing and concurrency control.
			CO5:Familiarity with database storage structures and access technique



31	II/II	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	CO1: Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
			CO2: Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
			CO3: Learn different knowledge representation techniques.
			CO4: Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
			CO5: Comprehend the applications of Probabilistic Reasoning and Bayesian Networks.
32	II/II	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	CO1: Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
			CO2: Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
			CO3: Use multithreading concepts to develop inter process communication.
			CO4: Understand the process of graphical user interface design and implementation using AWT or swings.
			CO5: Develop applets that interact abundantly with the client environment and deploy on the server.
33	II/II	DATABASE MANAGEMENT SYSTEMS LAB	CO1: Introduce ER data model, database design and normalization
			CO2: Learn SQL basics for data definition and data manipulation
			CO3: Design database schema for a given application and apply normalization
			CO4: Acquire skills in using SQL commands for data definition and data manipulation.
			CO5: Develop solutions for database applications using procedures, cursors and triggers
34	II/II	JAVA PROGRAMMING LAB	CO1: To understand swing controls in Java
			CO2: Able to write the programs for solving real world problems using Java OOP principles.
			CO3: Able to write programs using Exceptional Handling approach.
			CO4: Able to write multithreaded applications.
			CO5: Able to write GUI programs using swing controls in Java.
35	II/II	GENDER SENSITIZATION LAB	CO1: Students will have developed a better understanding of important issues related to gender in contemporary India.
			CO2: Students will be sensitized to basic dimensions of the

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			<p>biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p>
			<p>CO3:Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p>
			<p>CO4:Students will acquire insight into the gendered division of labor and its relation to politics and economics.</p>
			<p>CO5:Students will develop a sense of appreciation of women in all walks of life.</p>

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**Department of Humanities and Sciences I & II Sem Course Outcomes For The Academic Year 2021-22
(Regulation – R18)**

Department of Humanities and Sciences I & II Sem Course Outcomes For The Academic Year 2021-22 (R18)			
S.No.	Subject Code	Course Name	Course Outcomes
1	MA101BS	Mathematics - I	<p>CO1:Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.</p> <p>CO2:Find the Eigen values and Eigen vectors. Reduce the quadratic form to canonical form using orthogonal transformation.</p> <p>CO3:Analyze the nature of sequence and series.</p> <p>CO4:Solve the applications on the mean value theorems. Evaluate the improper integrals using Beta and Gamma functions.</p> <p>CO5:Find the extreme values of functions of two variables with/without constraints.</p>
2	EN105HS	ENGLISH	<p>CO1:Take part in computer – assisted multi – media language learning activities to learn individually and independently.</p> <p>CO2:Identify nuances of English language through audio-visual experience and group activities.</p> <p>CO3:Demonstrate consistent accent and intelligibility in pronunciation of English through practice</p> <p>CO4:Improve the fluency of students in spoken English and neutralize their mother tongue influence.</p> <p>CO5:Relate the use of English language appropriately for public speaking and interviews.</p>
3	EN107HS/E N207HS	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB	<p>CO1:Student will be able to attain Better understanding of nuances of English language through audio- visual experience and group activities</p> <p>CO2:Understand the Neutralization of accent for intelligibility</p> <p>CO3:Speaking skills with clarity and confidence which in turn enhances their employability skills</p> <p>CO4:To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning</p> <p>CO5:To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm</p>
4	AP202BS	APPLIED PHYSICS	<p>CO1:The student would be able to learn the fundamental concepts on Quantum behavior of matter in its micro state.</p> <p>CO2:The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.</p> <p>CO3:Design, characterization and study of properties of</p>

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			<p>material help the students to prepare new materials for various engineering applications.</p> <p>CO4: Student able to find the characteristics of lasers and optical fibres.</p> <p>CO5: The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.</p>
5	AP105BS/A P205BS	APPLIED PHYSICS LAB	<p>CO1: To determine the energy gap of a semiconductor diode.</p> <p>CO2: To study the V-I Characteristics of solar cell.</p> <p>CO3: Determination of magnetic field along the axis of a current carrying coil.</p> <p>CO4: To determine Hall co-efficient of a given semiconductor.</p> <p>CO5: To study the characteristics of LASER sources.</p>
6	CH102BS	CHEMISTRY	<p>CO1: Understand the concepts of molecular and atomic orbitals and band theory related to conductivity.</p> <p>CO2: Apply different methods to convert hard water into soft water.</p> <p>CO3: Apply the electro chemistry concept to control corrosion process</p> <p>CO4: Analyse the reaction mechanism of organic molecules and synthesis of drug molecules.</p> <p>CO5: Apply the basic techniques of spectroscopy in medical and other fields</p>
7	CH106BS/C H206ES	ENGINEERING CHEMISTRY LAB	<p>CO1: Determination of parameters like hardness and chloride content in water.</p> <p>CO2: Estimation of rate constant of a reaction from concentration – time relationships.</p> <p>CO3: Determination of physical properties like adsorption and viscosity.</p> <p>CO4: Calculation of R_f values of some organic molecules by TLC technique.</p> <p>CO5: Polish their etiquette, improve telephonic skills and appreciate the need for culture in maintenance of public relations.</p>
8	EE103ES	BASIC ELECTRICAL ENGINEERING	<p>CO1: To analyze and solve electrical circuits using network laws and theorems.</p> <p>CO2: To understand and analyze basic Electric and Magnetic circuits</p> <p>CO3: To study the working principles of Electrical Machines</p> <p>CO4: To introduce components of Low Voltage Electrical Installations</p> <p>CO5: To analyze and solve electrical circuits using network laws and theorems.</p>
9	EE108ES/E E208ES	BASIC ELECTRICAL	<p>CO1: Get an exposure to basic electrical laws.</p> <p>CO2: Understand the response of different types of electrical</p>

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		ENGINEERING LAB	<p>circuits to different excitations.</p> <p>CO3: Understand the measurement, calculation and relation between the basic electrical parameters</p> <p>CO4: Understand the basic characteristics of transformers and electrical machines.</p> <p>CO5: To analyze the performance characteristics of DC and AC electrical machines</p>
10	CS203ES	PROGRAMMING FOR PROBLEM SOLVING	<p>CO1: To write algorithms and to draw flowcharts for solving problems</p> <p>CO2: To convert the algorithms/flowcharts to C programs.</p> <p>CO3: To code and test a given logic in the C programming language.</p> <p>CO4: To decompose a problem into functions and to develop modular reusable code</p> <p>CO5: To use arrays, pointers, strings and structures to write C programs.</p>
11	CS106ES/ CS206ES	PROGRAMMING FOR PROBLEM SOLVING LAB	<p>CO1: Formulate the algorithms for simple problems</p> <p>CO2: Translate given algorithms to a working and correct program</p> <p>CO3: Correct syntax errors as reported by the compilers</p> <p>CO4: Identify and correct logical errors encountered during execution</p> <p>CO5: Represent and manipulate data with arrays, strings and structures</p>
12	ME105ES/ ME205ES	ENGINEERING WORKSHOP	<p>CO1: Study and practice on machine tools and their operations</p> <p>CO2: Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.</p> <p>CO3: Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.</p> <p>CO4: Apply basic electrical engineering knowledge for house wiring practice.</p> <p>CO5: Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.</p>
13	MA201BS	MATHEMATICS - II	<p>CO1: To Understand whether the given differential equation of first order is exact or not and to find solutions of linear and Bernoulli's differential equations</p> <p>CO2: To Analyze higher order differential equation and apply the concept of differential equation to real world problems.</p> <p>CO3: To Evaluate the multiple integrals and apply the concept to find areas volumes and centre of mass</p> <p>CO4: To Find the grad, divergence and curl of a vector, and about vector identities</p> <p>CO5: To Evaluate the line, surface and volume integrals and</p>

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			converting them from one to another
14	ME204ES	ENGINEERING GRAPHICS	CO1: Apply computer aided drafting tools to create 2D and 3D objects
			CO2: Sketch conics and different types of solids
			CO3: Appreciate the need of Sectional views of solids.
			CO4: Development of surfaces of solids
			CO5: Read and interpret engineering drawings
15	MC109ES/ MC209ES	ENVIRONMENTAL SCIENCE	CO1: Understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
			CO2: Understanding the importance of ecological balance for sustainable development.
			CO3: Understanding the impacts of developmental activities and mitigation measures.
			CO4: Understanding the environmental policies and regulations
			CO5: Understanding the Environmental Pollution and Control Technologies

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**Department in Master of Business Administration I & II Sem Course Outcomes
For The Academic Year 2021-22 (Regulation – R19)**

Department in Master of Business Administration I & II Sem Course Outcomes For The Academic Year 2021-22 (R19)			
S.No.	Year/Sem	Course Name	Course Outcomes
1	I/I	MANAGEMENT AND ORGANIZATIONAL BEHAVIOR	CO1: Gain understanding of the Concepts of Management, its Evolution, Functions and the Theories contributed by various Management Thinkers.
			CO2: Learn the process of planning, goal setting and the process of decision making with the help of various models.
			CO3: Learn the processes of Organizing and Controlling with the help of various Organizational Structures.
			CO4: Appreciate the relevance of Individual and group behavior in an organization and the role of Culture and dynamics
			CO5: Identify different Leadership Styles, Skills and the Theories of Motivation
2	I/I	BUSINESS ECONOMICS	CO1: Understand the Concepts and Principles of Business Economics.
			CO2: Learn various concepts and practical applications of Demand and Supply viz. Laws, Types, Elasticity, Forecasting and Equilibrium.
			CO3: Learn concepts and applications related to Production and Cost of a firm.
			CO4: Learn the features of various Market Structures along with the Decision-making with regards to Price and Output in Short and Long Terms.
			CO5: Understand the concepts of Pricing Practices, Theory of Firm and Managerial & Behavioral Theories of a Firm
3	I/I	FINANCIAL REPORTING AND ANALYSIS	CO1: Understand the Concepts and Principles of Accounting.
			CO2: Understand the Accounting Process in detail.
			CO3: Learn various aspects in depreciation, Inventory and Goodwill.
			CO4: Analyze the Working Capital and Flow of Funds and Cash into the Business
			CO5: Prepare, analyze and Interpret Financial Statements.
4	I/I	RESEARCH METHODOLOGY AND STATISTICAL ANALYSIS	CO1: Gain a conceptual overview of Research and the relevant concepts to Research.
			CO2: Learn the different types of Research Designs, Data Collection Tools and Procedures.
			CO3: Use different methods of representing data through Graphs and Tables; gain an overview of Statistics and relevant concepts and conduct Small Sample Tests.
			CO4: Learn to solve mathematical problems related to ANOVA

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			(One-way and Two-way), Correlation and Regression. CO5: Learn the application of Time Series and Index Numbers; appreciate the need for preparing and presenting a structured Research Report.
5	I/I	LEGAL AND BUSINESS ENVIRONMENT	CO1: Understand the Business Laws related to Incorporation of a company. CO2: Learn the Law of Contract & Sale of Goods CO3: Learn the salient features of Negotiable Instruments Act 1881 CO4: Learn the Reforms Undertaken by the Government with respect to the challenging business environments. CO5: Gain insights of the Regulatory Framework in India.
6	I/I	BUSINESS ETHICS AND CORPORATE GOVERNANCE	CO1: Understand the Need for Business Ethics and Corporate Governance in India. CO2: Apply Knowledge of Established Methodologies of Solving Professional Ethical Issues. CO3: Learn Codes and Committees in Corporate Governance. CO4: Understand the Role of Board in Corporate Governance. CO5: Assess the Stakeholder perspective of Corporate Governance.
7	I/I	BUSINESS COMMUNICATIONS LAB	CO1: Appreciate the importance and influence of Business Communication and learn its applications for the purpose of self-development. CO2: Learn by practice of writing a variety of formal and informal letters & e-mails and reports and improve the readability of written documents CO3: Identify the intricacies of writing Business Reports and Proposals CO4: Develop verbal (oral) skills by giving presentations and participating in group discussions; appreciate the impact of body language in the process of communication CO5: Polish their etiquette, improve telephonic skills and appreciate the need for culture in maintenance of public relations.
8	I/I	STATISTICAL DATA ANALYSIS LAB	CO1: Understand the importance of the main functions of MS-Excel /SPSS. CO2: Practice advance Excel Tools for conduction of Data Analysis CO3: Evaluate Data Analysis using Pivot Tables and Pivot Charts. CO4: Analyze the Data using Descriptive Statistics CO5: Conduct various Parametric and Non-parametric Tests using MS Excel / SPSS
9	I/II	HUMAN RESOURCE	CO1: Understand the concepts, role and functions of HRM and appreciate the need of HR to act as a Strategic Business Partner

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		MANAGEMENT	<p>of the Organization.</p> <p>CO2: Learn the methods of conducting Job Analysis, process of writing Job Descriptions & Specifications and the processes of recruitment and selection.</p> <p>CO3: Gain an understanding of various concepts and practices of Employee Training & Development and Performance Management & Appraisals.</p> <p>CO4: Learn the principles and practices of Employee Compensation and Rewards, with the help of Job Evaluation & Broad-banding etc. and the salient features of Workmen Compensation Act and Minimum Wages Act.</p> <p>CO5: Appreciate the need for effective Employee Relations and learn the salient features of Industrial Disputes Act and Factories Act.</p>
10	I/II	MARKETING MANAGEMENT	<p>CO1: Understand the important concepts and principles of Marketing Management and Marketing Research.</p> <p>CO2: Learn about the analysis of Market Opportunities and Customer Value with the help of Marketing Mix Elements.</p> <p>CO3: Learn the significance of designing a customer driven strategy through Marketing Segmentation, Targeting and Positioning.</p> <p>CO4: Assess Global marketing, green marketing strategies for sustainable development.</p> <p>CO5: Gain insights of the key aspects of pricing decisions and the role of communication</p>
11	I/II	FINANCIAL MANAGEMENT	<p>CO1: Understand the concept of time value of money.</p> <p>CO2: Learn about the capital budgeting techniques and cost of capital.</p> <p>CO3: Learn the significance of Capital structure vs. financial structure.</p> <p>CO4: Assess dividend policies of Indian companies, determinants of working capital, analysis of investment in inventory.</p> <p>CO5: Understand the Concepts and Applications of Working Capital Management and Management of Current Assets.</p>
12	I/II	QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS	<p>CO1: Understand the origin and application of operations research.</p> <p>CO2: Learn about the Formulation of Linear Programming Problem for different areas.</p> <p>CO3: Appreciate the significance of variations of assignment problem, methods for finding Initial feasible solution.</p> <p>CO4: Learn the aspects of Decision Theory and Network Analysis</p> <p>CO5: Gain insights of the theoretical principles and practical applications of different queuing models.</p>

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13	I/II	ENTREPRENEURSHIP AND DESIGN THINKING	CO1: Understand the approaches to entrepreneurship.
			CO2: Learn about the individual entrepreneurial mind-set and Personality.
			CO3: Learn the significance of Feasibility Analysis, Industry, competitor analysis, new venture development.
			CO4: Understand the principles of implementation of Design Thinking.
			CO5: Appreciate the relevance of Creativity in the process of implementation of Design Thinking
14	I/II	LOGISTICS AND SUPPLY CHAIN MANAGEMENT	CO1: Understand the cyclical perspective of logistics and supply chain process.
			CO2: Learn about the distribution, transportation, warehousing related issues and challenges in supply chain.
			CO3: Appreciate the significance of network design in the supply chain.
			CO4: Gain knowledge of various models / tools of measuring the Supply Chain Performance.
			CO5: Appreciate the role of coordination and technology in supply chain management.
15	I/II	RURAL MARKETING	CO1: Understand the importance of Indian Rural Economy.
			CO2: Learn various rural marketing strategies
			CO3: Learn challenges of Retail Channel Management.
			CO4: Understand the aspects of rural business research.
			CO5: Learn e- rural marketing, CSR, IT for rural development, e-Governance for Rural India.
16	II/I	PRODUCTION AND OPERATIONS MANAGEMENT	CO1: Understand the importance concepts of operations management
			CO2: Learn various strategies in product and process design, analysis.
			CO3: Learn examine the various aspects of plant location and product layout.
			CO4: Understand the aspects of scheduling.
			CO5: Gain insights of integrated materials management, e-procurement, materials planning
17	II/I	MANAGEMENT INFORMATION SYSTEMS	CO1: Understand the importance of MIS for strategic advantages.
			CO2: Learn various business applications of information systems like e-business, BPR, DSS
			CO3: Learn examine the information system planning.
			CO4: Understand alternative methods for building information system
			CO5: Learn cyber security with inter networks security defenses.
18	II/I	DATA ANALYTICS	CO1: Understand Importance of Analytics
			CO2: Understand the analytical tools

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			<p>CO3:Understand Application of Analytical tools to solve business problems.</p> <p>CO4:Understand the importance of ever-increasing volume, variety and velocity of data in organization</p> <p>CO5:Understand the application of data analytical tools for decision making.</p>
19	II/I	DIGITAL MARKETING	<p>CO1:Students will be understanding the applications of digital marketing in the globalized market</p> <p>CO2:Students will be understanding Channels of Digital Marketing</p> <p>CO3:Students will be understanding digital marketing plan</p> <p>CO4:Students will be understanding Search engine marketing</p> <p>CO5:Students will be understanding Online Advertising</p>
20	II/I	ADVERTISING AND SALES MANAGEMENT	<p>CO1:Students will be understanding the advertising management offering services</p> <p>CO2:Students will be understanding channels of distribution</p> <p>CO3:Students will be understanding sales planning</p> <p>CO4:Students will be understanding the sales budgeting</p> <p>CO5:Students will be understanding the distribution channels and managing them</p>
21	II/I	CONSUMER BEHAVIOR	<p>CO1:To enable understanding of marketing decisions keeping in mind the consumer behavior.</p> <p>CO2:To explain the influence of culture, subculture, social class, social group, family and personality on consumer behavior.</p> <p>CO3:To help learn about consumer perception and motivation.</p> <p>CO4:To highlight the aspects in consumer decision-making process.</p> <p>CO5:To help understand the impact of consumer is man ethics.</p>
22	II/I	SECURITY ANALYSIS PORTFOLIO MANAGEMENT	<p>CO1:Students will be able to understand Indian Investment Environment</p> <p>CO2:Students will be able to understand Portfolio Analysis</p> <p>CO3:Students will be able to understand Bond valuation and management</p> <p>CO4:Students will be able to understand Equity valuation of Cash market and derivatives</p> <p>CO5:Students will be able to understand Performance evaluation of Portfolios.</p>
23	II/I	FINANCIAL INSTITUTIONS, MARKETS AND SERVICES	<p>CO1:Students will be able to understand Financial and Securities markets Services.</p> <p>CO2:Students will be able to understand Introduction to Indian Financial system</p> <p>CO3:Students will be able to understand Banking and Non-Banking Institutions</p>

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			<p>CO4:Students will be able to understand Appreciate the relevance of Individual and group Financing Decisions.</p> <p>CO5:Students will be able to understand Identify different types of Funds and Fee based</p>
24	II/I	STRATEGIC MANAGEMENT ACCOUNTING	<p>CO1:Students will be able to Understand the Concepts and Principles of Accounting</p> <p>CO2:Students will be able to Understand the Accounting Process in detail</p> <p>CO3:Students will be able to Understand the Learn various aspects in depreciation, Inventory and Good wills</p> <p>CO4:Students will be able to Understand the Analyze the Working Capital and Flow of Funds and Cash into the Business</p> <p>CO5:Students will be able to Understand the Prepare, analyze and Interpret Financial Statements.</p>
25	II/I	PERFORMANCE MANAGEMENT SYSTEMS	<p>CO1:Understand the significance of performance management.</p> <p>CO2:Understand communication of Performance management.</p> <p>CO3:Understand performance management and development of employees.</p> <p>CO4:Understand reward system.</p> <p>CO5:Understand other performance related topics.</p>
26	II/I	LEARNING AND DEVELOPMENT	<p>CO1:Students will be able to understand the importance of Learning performance</p> <p>CO2:Students will be able to understand Training and Development</p> <p>CO3:Students will be able to understand Training Need Analysis</p> <p>CO4:Students will be able to understand Training Methods</p> <p>CO5:Students will be able to understand Contemporary issues in Training and Development</p>
27	II/I	MANAGEMENT OF INDUSTRIAL RELATIONS	<p>CO1:Students will be able to understand Importance of industrial relations</p> <p>CO2:Students will be able to understand Collective bargaining mechanism</p> <p>CO3:Students will be able to understand Parties and roles in industrial relations</p> <p>CO4:Students will be able to understand Labor legislation aspects</p> <p>CO5:Students will be able to understand Importance of industrial relations</p>
28	II/II	STRATEGIC MANAGEMENT	<p>CO1:Understand the importance of strategic management process.</p> <p>CO2:Learn various market life cycle models for strategic analysis.</p>

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			<p>CO3:Learn Strategies for competing in global markets and internet economy.</p> <p>CO4:Appreciate the need for having appropriate Turnaround and Diversification Strategies.</p> <p>CO5:Understand the aspects of strategy evaluation and control.</p>
29	II/II	CUSTOMER RELATIONSHIP MANAGEMENT	<p>CO1:Students will be able to understand to need of CRM</p> <p>CO2:Students will be able to understand building customer relations</p> <p>CO3:Students will be able to understand CRM process</p> <p>CO4:Students will be able to understand CRM structures</p> <p>CO5:Students will be able to understand Planning and Implementation of CRM.</p>
30	II/II	INTERNATIONAL MARKETING	<p>CO1:Students will be understanding the applications of digital marketing in the globalized market</p> <p>CO2:Students will be understanding Channels of Digital Marketing</p> <p>CO3:Students will be understanding digital marketing plan</p> <p>CO4:Students will be understanding Search engine marketing</p> <p>CO5:Students will be understanding Online Advertising</p>
31	II/II	SERVICES MARKETING	<p>CO1:Students will be able to understand Marketing Management of companies offering Services to understand</p> <p>CO2:Students will be able to understand Characteristics of services</p> <p>CO3:Students will be able to understand consumer behavior in services</p> <p>CO4:Students will be able to understand align service design and standards</p> <p>CO5:Students will be able to understand delivering service, managing services promises</p>
32	II/II	INTERNATIONAL FINANCIAL MANAGEMENT	<p>CO1:Students will be able to understand International Financial Management</p> <p>CO2:Students will be able to understand Balance of Payments</p> <p>CO3:Students will be able to understand Foreign Exchange Markets</p> <p>CO4:Students will be able to understand Asset and liability Management.</p> <p>CO5:Students will be able to understand International financing</p>
33	II/II	STRATEGIC INVESTMENT AND FINANCING DECISIONS	<p>CO1:Students will be able to understand Investment Decisions in Risk and uncertainty</p> <p>CO2:Learn the process of planning, goal setting Strategic investment decisions</p> <p>CO3:Learn the processes of Organizing and Controlling</p>

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			Investment Appraisal Techniques CO4: Students will be able to understand Appreciate therelevance of Individual and group Financing Decisions. CO5: Students will be able to understand Identify different types of investment decisions
34	II/II	RISK MANAGEMENT & FINANCIAL DERIVATIVES	CO1: Concepts of Risk Management CO2: Risk Management Measurement CO3: Risk Management using Forward CO4: Risk Management using Futures CO5: Risk Management using Options and Swaps.
35	II/II	INTERNATIONAL HUMAN RESOURCE MANAGEMENT	CO1: Students will be able to understand Cultural aspects of IHRM Global human Resource Planning CO2: Students will be able to understand Role of IHRM in Successful MNC CO3: Students will be able to understand IHRM Global human Resource Planning CO4: Students will be able to understand Training and development of Global employees CO5: Students will be able to understand Performance Management of Global employees.
36	II/II	LEADERSHIP AND CHANGE MANAGEMENT	CO1: Students will be able to understand Leadership, Role and function of a Leader CO2: Students will be able to understand Leadership theories and styles CO3: Students will be able to understand Organizational change concepts CO4: Students will be able to understand Perspectives of change CO5: Students will be able to understand Strategies for Managing change
37	II/II	TALENT AND KNOWLEDGE MANAGEMENT	CO1: Students will be able to understand Talent Management Process CO2: Students will be able to understand Succession and career planning approaches CO3: Students will be able to understand Knowledge management aspects CO4: Students will be able to understand Nature of Knowledge management assessment CO5: Students will be able to understand Knowledge management solutions Planning

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