



SIDDHARTHA

College Code -TP

INSTITUTE OF ENGINEERING & TECHNOLOGY

(Accredited by NBA, Approved by AICTE & Affiliated to JNTU)
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COs for all Courses (A.Y. 2020-21)

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Institute of Engineering & Technology,
Vinobha Nagar(V), Ibrahimpatnam(M),
Ranga Reddy District-501 506.

Civil Engineering I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No.	Year/Sem	Course Name	Course Outcomes
1	II/I	Surveying and Geometrics	CO1: Calculate angles, distances and levels
			CO2: Identify data collection methods and prepare field notes
			CO3: Understand the working principles of survey instruments
			CO4: Estimate measurement errors and apply corrections
			CO5: Interpret survey data and compute areas and volumes
2	II/I	Engineering Geology	CO1: Understand weathering process and mass movement
			CO2: Distinguish geological formations
			CO3: Identify geological structures and processes for rock mass quality
			CO4: Identify subsurface information and groundwater potential sites through geophysical investigations
			CO5: Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels
3	II/I	Strength of Materials - I	CO1: Analyze the statically determinate and indeterminate problems.
			CO2: Determine the stresses and strains in the members subjected to axial, bending.
			CO3: Evaluate the slope and deflection of beams subjected to loads.
			CO4: Determine the principal stresses and strains in structural members
			CO5: Frame an idea to design a system, component or process
4	II/I	Probability and Statistics	CO1: Understand concepts of discrete probability, conditional probability, independence, and be able to apply these concepts to engineering applications
			CO2: Be able to use statistical concepts to analyze and interpret engineering data.
			CO3: Equipping students with essential tools for statistical analyses at the graduate level
			CO4: Providing students with a formal treatment of probability theory
			CO5: Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data
5	II/I	Fluid Mechanics	CO1: Apply conservation laws to derive governing equations of fluid flows
			CO2: Compute hydrostatic and hydrodynamic forces.
			CO3: Analyze and design simple pipe systems.


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			CO4:4 Apply principles of dimensional analysis to design experiments.
			CO5:Compute drag and lift coefficients.
6	II/I	Surveying Lab	CO1:Able to perform chain survey& plotting of closed traverse and also obstacles
			CO2:Determines distance between two inaccessible points with compass
			CO3:Perform reduced level & distances using tachometric survey
			CO4:Able to perform trigonometric leveling using theodolite for heights and distances problems.
			CO5:Determines Radiation method, intersection methods by plane table survey
7	II/I	Strength of Materials Lab	CO1:Conduct tension test on Materials like steel etc.
			CO2:Conduct compression tests on spring, wood and concrete
			CO3:Conduct flexural and torsion test to determine elastic constants
			CO4:Determine hardness of metals
			CO5:Write a technical laboratory report
8	II/I	Engineering Geology Lab	CO1:1 Understand weathering process and mass movement
			CO2:Distinguish geological formations
			CO3:Identify geological structures and processes for rock mass quality
			CO4:Identify subsurface information and groundwater potential sites through geophysical investigations
			CO5:Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels
9	II/I	Constitution of India	CO1:understand the emergence and evaluation of Indian constitution
			CO2:Understand the structure and composition of Indian constitution
			CO3:Understand and analyses federalism in the Indian context
			CO4:analyse panchayathi Raj institutions as a medium of decentralization.
			CO5:understand and analyze the three organs of the state in the contemporary scenario
10	II/II	Basic Electrical and Electronics Engineering	CO1:To analyze and solve electrical circuits using network laws and theorems.
			CO2:To understand and analyze basic Electric and Magnetic circuits
			CO3:To study the working principles of Electrical Machines
			CO4:To introduce components of Low Voltage Electrical Installations
			CO5:To identify and characterize diodes and various types of transistors
11	II/II	Basic Mechanical Engineering	CO1:To understand the mechanical equipment for the usage at civil engineering systems,

		for Civil Engineers	CO2:To familiarize with the general principles and requirement for refrigeration, manufacturing
			CO3:To realize the techniques employed to construct civil engineering systems
			CO4:4 To understand the manufacturing process for the usage at civil engineering constructions
			CO5:Learning the design and working process of machine tools for the usage of construction field
12	II/II	Building Materials, Construction and Planning	CO1:Define the Basic terminology that is used in the industry
			CO2:Categorize different building materials, properties and their uses
			CO3:Understand the Prevention of damage measures and good workmanship
			CO4:Explain different building services
			CO5:Expalin different building plan services
13	II/II	Strength of Materials - II	CO1:Describe the concepts and principles, understand the theory of elasticity, and perform calculations, relative to the strength of structures and mechanical components in particular to torsion and direct compression;
			CO2:To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
			CO3:Analyze strength and stability of structural members subjected to Direct, and Direct and Bending stresses;
			CO4: Understand and evaluate the shear center and unsymmetrical bending.
			CO5:Frame an idea to design a system, component, or process
14	II/II	Hydraulics and Hydraulic Machinery	CO1: Apply their knowledge of fluid mechanics in addressing problems in open channels and hydraulic machinery.
			CO2: Understand and solve problems in uniform, gradually and rapidly varied flows in open channel in steady state conditions.
			CO3: Apply dimensional analysis and to differentiate the model, prototype and similitude conditions for practical problems.
			CO4:Get the knowledge on different hydraulic machinery devices and its principles that will be utilized in hydropower development and for other practical usages
			CO5:Students able to know the performance of single stage and multistage pumps
15	II/II	Structural Analysis - I	CO1:An ability to apply knowledge of mathematics, science, and engineering
			CO2:Analyse the statically indeterminate bars and continuous beams
			CO3:Draw strength behavior of members for static and dynamic loading

			CO4: Calculate the stiffness parameters in beams and pin jointed trusses.
			CO5: Understand the indeterminacy aspects to consider for a total structural system
16	II/II	Computer aided Civil Engineering Drawing	CO1: Use the Autocad commands for drawing 2D & 3D building drawings required for different civil engg applications.
			CO2: Plan and draw Civil Engineering Buildings as per aspect and orientation.
			CO3: Presenting drawings as per user requirements and preparation of technical report
17	II/II	Hydraulics and 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: Write a technical laboratory report
18	II/II	Basic Electrical and Electronics Engineering Lab	CO1: To analyze and solve electrical circuits using network laws and theorems.
			CO2: To understand and analyze basic Electric and Magnetic circuits
			CO3: To study the working principles of Electrical Machines
			CO4: To introduce components of Low Voltage Electrical Installations
			CO5: To identify and characterize diodes and various types of transistors
19	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 attain a finer grasp of how gender discrimination works in our society and how to counter it.
			CO3: Students will acquire insight into the gendered division of labour and its relation to politics and economics.
			CO4: Men and women students and professionals will be better equipped to work and live together as equals.
			CO5: Students will develop a sense of appreciation of women in all walks of life
20	III/I	Structural Analysis-II	CO1: Analyze the two hinged arches.
			CO2: Solve statically indeterminate beams and portal frames using classical methods

			CO3:Sketch the shear force and bending moment diagrams for indeterminate structures.
			CO4:Formulate the stiffness matrix and analyze the beams by matrix methods
			CO5:Analyze to know the influence lines for indeterminate structures
21	III/I	Geotechnical Engineering	CO1:Characterize and classify the soils
			CO2:Able to estimate seepage, stresses under various loading conditions and compaction characteristics
			CO3:Able to analyse the compressibility of the soils
			CO4:Able to understand the strength of soils under various drainage conditions
			CO5:Able to know the failure mechanism and the shear strength of soils
22	III/I	Structural Engineering –I (RCC)	CO1:Compare and Design the singly reinforced, doubly reinforced and flanged sections.
			CO2:Design the axially loaded, uniaxial and biaxial bending columns
			CO3:Classify the footings and Design the isolated square, rectangular and circular footings
			CO4:Distinguish and Design the one-way and two-way slabs.
			CO5:Student able to know the design of footings for different foundations
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:An 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:An ability to design flexible and rigid highway pavements for varying traffic compositions as well as soil subgrade and environmental conditions using the standards stipulated by Indian Roads Congress.
			CO4:An ability to evaluate the structural and functional conditions of in-service highway pavements and providesolution in the form of routine maintenance measures or designed overlays using Indian Roads congress guidelines.
			CO5:An ability to assess the issues related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioural patterns.
24	III/I	Concrete Technology	CO1:Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting differenttests.

			CO2:Recognize the effects of rheology and early age properties of concrete on its long term behavior.
			CO3:Apply the use of various chemical admixtures and mineral additives to design cement-based materials with tailor-made properties
			CO4:Use advanced laboratory techniques to characterize cement-based materials.
			CO5:Perform mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, and fibre reinforced concrete.
25	III/I	Engineering Economics and Accountancy	CO1:To perform and evaluate present and future worth of the alternate projects and to appraise projects by using traditional and DCF Methods.
			CO2:To carry out cost benefit analysis of projects and to calculate BEP of different alternative projects.
26	III/I	Highway Engineering and Concrete Technology Lab	CO1:Categorize the test on materials used Civil Engineering Building & Pavement constructions
			CO2:To perform the tests on concrete for its characterization.
			CO3:To Design Concrete Mix Proportioning by Using Indian Standard Method.
			CO4:Examine the tests performed for Bitumen mixes.
			CO5:To prepare a laboratory report
27	III/I	Geotechnical Engineering Lab	CO1:At the end of the course, the student will be able to Classify and evaluate the behavior of the soils subjected to various loads.
28	III/I	Advanced Communication Skills Lab	CO1:The student will be able to use English language both written and spoken
			CO2:The student will be able to enrich their comprehension ability and fluency
			CO3:To understand the concept and will gain confidence level in the appearing in the jam, debate ,role-play
			CO4:The student will be able to develop the study skills and communication skills in formal and informal situations
			CO5:The student will be able to improve the language proficiency in English with writing skills also
29	III/I	Intellectual Property Rights	CO1: intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.
			CO2:Purpose and function of trademarks, acquisition of trade mark rights
			CO3:Foundation of patent law, patent searching process, ownership rights and transfer
			CO4:New development of intellectual property: new developments in trade mark law; copy right

			law, patent law, intellectual property audits
30	III/II	Hydrology & Water Resources Engineering	CO1:Understand the different concepts and terms used in engineering hydrology
			CO2:To identify and explain various formulae used in estimation of surface and Ground water hydrology components
			CO3:Demonstrate their knowledge to connect hydrology to the field requirement
			CO4:The students will able to know the how to increase the ground water table depends upon claimatic factors
			CO5:To understand and the importance of canal regulation system in irrigation
31	III/II	Environmental Engineering	CO1:Assess characteristics of water and wastewater and their impacts
			CO2:Estimate quantities of water and waste water and plan conveyance components
			CO3:Design components of water and waste water treatment plants
			CO4:Be conversant with issues of air pollution and control
			CO5:To understand the concept of various unit operations and design of water treatment systems
32	III/II	Foundation Engineering	CO1:understand the principles and methods of Geotechnical Exploration
			CO2:decide the suitability of soils and check the stability of slopes
			CO3:calculate lateral earth pressures and check the stability of retaining walls
			CO4:analyse and design the shallow and deep foundations
			CO5:student will able to analyse and design of well foundations
33	III/II	Structural Engineering –II (Steel)	CO1:Analyze the tension members, compression members.
			CO2:Design the tension members, compression members and column bases and joints and connections
			CO3:Analyze and Design the beams including built-up sections and beam and connections
			CO4:Identify and Design the various components of welded plate girder including stiffeners
			CO5:Analyse and design of roof trusses
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:To develop transformation of stresses in pretensioned members
			CO5:Student will able to know the composite beams and deflections

35	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
36	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
37	III-II	Environmental Science	CO1:Get the information about ecosystem and also about its functions like Food chain, Ecological pyramids etc.
			CO2:Get the knowledge about the different types of resources like land, water, mineral and energy and also about the effects of environment by the usage of these resources.
			CO3:Gain the knowledge about the ecosystem diversity, its values and also about the importance of the endemic species and different techniques involved in its conservation
			CO4:Gain the knowledge about the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.
			CO5:Get the complete information about EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations, awareness among people about protection of wild life, forest and other natural resources.
38	III/II	ADVANCED STRUCTURAL ANALYSIS	CO1:Analyze the multistory building frames by various approximate methods.
			CO2:Solve the continuous beams, portal frames by matrix methods of analysis.
			CO3:Analyze and design of large frames with or without shear walls
			CO4:Analyze and design plane truss continuous beams
			CO5:Student will able to know the structural behaviour of large frames
39	IV/I	Transportation Engineering	CO1:Understand Plan highway networks
			CO2:Design highway geometrics.
			CO3:Design Intersections and prepare traffic management plans.

			CO4:Design flexible and rigid pavements
			CO5:An ability to assess the issues related to road traffic and provide engineering solutions supported with an understanding of road user psychological and behavioural patterns.
40	IV/I	Estimation Quantity Surveying and Valuation	CO1:Understand the technical specifications for various works to be performed for a project
			CO2:Quantify the worth of a structure by evaluating the quantities of constituents, derive their cost rates
			CO3:Understand how competitive bidding works and how to submit a bidding proposal
			CO4:An idea of how to optimize construction projects based on costs
			CO5:An ability to put forward ideas and understandings to others with effective communication processes
41	IV/I	Foundation Engineering	CO1:To understand the concept of different types of excavations in foundation engineering and its design problems and also to know which types of loads required
			CO2:To analysis the how the soils are to be stabilized and also to estimate what are the methods are required to improve the stability of soils
			CO3:To identify the where the soils are to be classified in the foundation engineering
			CO4:Able to know how the design the gravity of retaining walls
			CO5:To identify the for different foundation required for different types of soils
42	IV/I	Watershed Management	CO1:Identify causes of soil erosion
			CO2:Plan and design soil conservation measures in a watershed
			CO3:Plan and design water harvesting and groundwater recharge structures
			CO4:Plan measures for reclamation of saline soils
43	IV/I	Traffic Engineering.	CO1:Understand basics principles of Traffic Engineering
			CO2:Analyze parking data and model accidents
			CO3:Determine capacity and LOS.
			CO4:To provide engineering techniques to achieve Safe and efficient movement of people and goods on roadways
			CO5:Student will able to know deal with traffic issues including safety, planning, design, operation and control
44	IV/I	Transportation Engineering Lab	CO1:At the end of the course, the student will be able to Asses for Highway construction properties of highway materials

45	IV/I	Environmental Engineering Lab	CO1:The student will develop the Knowledge in mathematics, science and engineering
			CO2:The students will be able to to design and conduct experiments, interpret and analyze data, and report results
			CO3:The students will demonstrate the ability to design of Civil Engineering systems or a process that meets desired specifications and requirements related to all fields of Civil Engineering
			CO4:The students will will demonstrate the ability to function on engineering and science laboratory teams, as well as on multidisciplinary design teams
			CO5:The students will demonstrate the ability to identify, formulate and solve Civil engineering problems
46	IV/I	Industry Oriented Mini Project	CO1:Formulate a real world problem and develop its requirements
			CO2:Ability to plan and execute well defined objective
			CO3:Ability to work in team at component level
			CO4:Ability to solve problems on analysis & design
			CO5:Self learn new software's and/or techniques that contribute to the software solution of the project
47	IV/I	Seminar	CO1:The students will be able to recall existing technologies in the area of Designing.
			CO2:The students will be able to describe, compare and evaluate different technologies
			CO3:The students will be able to decide the area of interest
			CO4:The students will be able to develop their communication skills
			CO5:The students will be able to write technical reports.
48	IV/II	Waste Management	CO1:Identify the physical and chemical composition of wastes
			CO2:Analyze the functional elements for solid waste management
			CO3:Analyze the functional elements for liquid waste management
			CO4:To Understand the effluent treatment Plants and its disposal
			CO5:Plan measures for reclamation of saline soils
49	IV/II	Industrial Waste Water Treatment.	CO1:Identify the characteristics of industrial wastewaters
			CO2:Describe pollution effects of disposal of industrial effluent
			CO3:Identify and design treatment options for industrial wastewater
			CO4:Formulate environmental management plan
			CO5:Suggestion methods for safe disposal of hazardous wastes.

50	IV/II	Pavement Design	CO1:Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes
			CO2:Analyze flexible pavements
			CO3:Analyze rigid pavements
			CO4:Design a flexible pavement using IRC, Asphalt Institute, and AASHTO methods
			CO5:Design a rigid pavement using IRC, and AASHTO methods
51	IV/II	Major Project	CO1:student will able to Work in a group as a part of multidisciplinary team with professional responsibility
			CO2:student is able to Analysis and design of structure to meet desired needs within realistic constraints
			CO3:Student is capable of doing Review literature and finalizes problem statement.
			CO4:Student can Plan activity schedule and implementation in a given time span.
			CO5:Student will be able to Prepare and present technical report.


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Electrical & Electronics Engineering I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No	Year/ Sem	Course Name	Course Outcomes
1	II-I	ELECTRICAL CIRCUIT ANALYSIS	CO1: Students will demonstrate the ability to Apply network theorems for the analysis of electrical circuits
			CO2: Students will demonstrate the ability to Obtain the transient and steady-state response of electrical circuits.
			CO3: Students will demonstrate the ability to Analyze circuits in the sinusoidal steady-state (single-phase and three-phase)
			CO4: Students will demonstrate the ability to Analyze two port circuit behavior
2	II-I	ELECTRICAL MACHINES - I	CO1: Students will be able to Identify different parts of a DC machine & understand its operation
			CO2: Students will be able to Carry out different testing methods to predetermine the efficiency of DC machines
			CO3: Students will be able to Understand different excitation and starting methods of DC machines
			CO4: Students will be able to Control the voltage and speed of a DC machines
			CO5: Students will be able to Analyze single phase and three phase transformers circuits.
3	II-I	ELECTROMAGNET IC FIELDS	CO1: Students will be able to To understand the basic laws of electromagnetism
			CO2: Students will be able to To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3: Students will be able to To analyze time varying electric and magnetic fields.
			CO4: Students will be able to To understand Maxwell's equation in different forms and different media
			CO5: Students will be able to To understand the propagation of EM waves.
4	II-I	ANALOG ELECTRONICS	CO1: Students will demonstrate the ability to Know the characteristics, utilization of various components
			CO2: Students will demonstrate the ability to Understand the biasing techniques
			CO3: Students will demonstrate the ability to Design and analyze various rectifiers, small signal amplifier circuits
			CO4: Students will demonstrate the ability to Design sinusoidal and non-sinusoidal oscillators.
			CO5: Students will demonstrate the ability to A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits.
5	II-I	ENGINEERING MECHANICS	CO1: Students will be able to Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces
			CO2: Students will be able to Solve problem of bodies subjected to friction
			CO3: Students will be able to Find the location of centroid and calculate moment of inertia of a given section

			CO4: Students will be able to Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
			CO5: Students will be able to Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration
6	II-II	LAPLACE TRANSFORMS, NUMERICAL METHODS & COMPLEX VARIABLES	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2: Find the root of a given equation and estimate the value for the given data using interpolation
			CO3: Find the numerical solutions for a given ODE's
			CO4: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
			CO5: Taylor's and Laurent's series expansions of complex Function
7	II-II	ELECTRICAL MACHINES - II	CO1: Students will be able to Understand the concepts of rotating magnetic fields
			CO2: Students will be able to Understand the operation of ac machines.
			CO3: Students will be able to Analyze performance characteristics of ac machines.
8	II-II	CONTROL SYSTEMS	CO1: Students will be able to Understand the modeling of linear-time-invariant systems using transfer function and statespace representations.
			CO2: Students will be able to Understand the concept of stability and its assessment for linear-time invariant systems
			CO3: Students will be able to Design simple feedback controllers.
9	II-II	POWERSYSTEMS - I	CO1: Students will be able to Understand the concepts of power systems.
			CO2: Students will be able to Understand the operation of conventional generating stations and renewable sources of electrical power.
			CO3: Students will be able to Evaluate the power tariff methods
			CO4: Students will be able to Determine the electrical circuit parameters of transmission lines
			CO5: Students will be able to Understand the layout of substation and underground cables and corona
10	II-II	DIGITAL ELECTRONICS	CO1: Students will be able to Understand working of logic families and logic gates.
			CO2: Students will be able to Design and implement Combinational and Sequential logic circuits
			CO3: Students will be able to Understand the process of Analog to Digital conversion and Digital to Analog conversion
			CO4: Students will be able to Be able to use PLDs to implement the given logical problem.
11	III-I	MEASUREMENTS & INSTRUMENTATION	CO1: Students will be able to Understand different types of measuring instruments, their construction, operation and characteristics
			CO2: Students will be able to Identify the instruments suitable for typical measurements
			CO3: Students will be able to Apply the knowledge about transducers and instrument transformers to use them

			effectively.
			CO4: Students will be able to Apply the knowledge of smart and digital metering for industrial applications .
12	III-I	HIGH VOLTAGE ENGINEERING (Professional Elective I)	CO1: Students will be able to Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
			CO2: Students will be able to Knowledge of generation and measurement of D. C., A.C., & Impulse voltages.
			CO3: Students will be able to Knowledge of tests on H. V. equipment and on insulating materials, as per the standards
			CO4: Students will be able to Knowledge of how over-voltages arise in a power system, and protection against these overvoltages.
13	III-I	COMPUTER ARCHITECTURE (Professional Elective I)	CO1: Students will be able to Understand the concepts of microprocessors, their principles and practices.
			CO2: Students will be able to Write efficient programs in assembly language of the 8086 family of microprocessors.
			CO3: Students will be able to Organize a modern computer system and be able to relate it to real examples.
			CO4: Students will be able to Develop the programs in assembly language for 80286, 80386 and MIPS processors in real and protected modes.
			CO5: Students will be able to Implement embedded applications using ATOM processor.
14	III-I	ELECTRICAL MACHINE DESIGN (Professional Elective I)	CO1: Students will be able to Understand the construction and performance characteristics of electrical machines.
			CO2: Students will be able to Understand the various factors which influence the design: electrical, magnetic and thermal loading of electrical machines
			CO3: Students will be able to Understand the principles of electrical machine design and carry out a basic design of an ac machine.
			CO4: Students will be able to Use software tools to do design calculations.
15	III-I	POWER SYSTEMS-II	CO1: Students will be able to Analyze transmission line performance
			CO2: Students will be able to Apply load compensation techniques to control reactive power .
			CO3: Students will be able to Understand the application of per unit quantities
			CO4: Students will be able to Design over voltage protection and insulation coordination
			CO5: Students will be able to Determine the fault currents for symmetrical and unbalanced faults
16	III-I	BUSINESS ECONOMICS & FINANCIAL ANALYSIS	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business..
			CO2: The students will understand The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.

17	III-I	POWER ELECTRONICS	CO1: Students will be able to Understand the differences between signal level and power level devices.
			CO2: Students will be able to Analyze controlled rectifier circuits.
			CO3: Students will be able to Analyze the operation of DC-DC choppers.
			CO4: Students will be able to Analyze the operation of voltage source inverters.
18	III-II	POWER SEMI CONDUCTOR DRIVES (Professional Elective II)	CO1: Students will be able to Identify the drawbacks of speed control of motor by conventional methods.
			CO2: Students will be able to Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits.
			CO3: Students will be able to Understand Ac motor drive speed-torque characteristics using different control strategies its merits and demerits
			CO4: Students will be able to Describe Slip power recovery schemes.
19	III-II	WIND AND SOLAR ENERGY SYSTEMS (Professional Elective II)	CO1: Students will be able to Understand the energy scenario and the consequent growths of the power generate renewable energy sources.
			CO2: Students will be able to Understand the basic physics of wind and solar power generation.
			CO3: Students will be able to Understand the power electronic interfaces for wind and solar generation.
			CO4: Students will be able to Understand the issues related to the grid-integration of solar and wind energy systems
20	III-II	OPTIMIZATION TECHNIQUES (Professional Elective II)	CO1: Students will be able to explain the need of optimization of engineering systems.
			CO2: Students will be able to understand optimization of electrical and electronics engineering problems
			CO3: Students will be able to apply classical optimization techniques, linear programming, simplex algorithm, transportation problem
			CO4: Students will be able to apply unconstrained optimization and constrained non-linear programming and dynamic programming
			CO5: Students will be able to Formulate optimization problems.
21	III-II	POWER SYSTEM PROTECTION (Professional Elective II)	CO1: Students will be able to Compare and contrast electromagnetic, static and microprocessor-based relays .
			CO2: Students will be able to Apply technology to protect power system components.
			CO3: Students will be able to Select relay settings of over current and distance relays.
			CO4: Students will be able to Analyze quenching mechanisms used in air, oil and vacuum circuit breakers .
			CO4: Students will be able to Analyze quenching mechanisms used in air, oil and vacuum circuit breakers .
22	III-II	NON CONVENTIONAL ENERGY SOURCES (Open Elective I)	CO1: Students will be able to understand about Principles Of Solar Radiation
			CO2: Students will be able to understand Solar Energy Collection & Direct Energy Conversion
			CO3: Students will be able to understand Solar Energy Storage And Applications & Ocean Energy, Wind Energy

			CO4: Students will be able to understand Bio-Mass, Geothermal Energy.
23	III-II	POWER SYSTEM OPERATION AND CONTROL	CO1: Students will be able to Understand operation and control of power systems.
			CO2: Students will be able to Analyze various functions of Energy Management System (EMS) functions.
			CO3: Students will be able to Analyze whether the machine is in stable or unstable position.
			CO3: Students will be able to
			CO4: Students will be able to Understand power system deregulation and restructuring
24	III-II	MICRO PROCESSOR & MICRO CONTROLLERS	CO1: Students will be able to Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Students will be able to Understands the internal architecture, organization and assembly language programming of 8051/controllers.
			CO3: Students will be able to Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Students will be able to Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
25	III-II	SIGNALS & SYSTEMS	CO1: Students will be able to Differentiate various signal functions.
			CO2: Students will be able to Represent any arbitrary signal in time and frequency domain.
			CO3: Students will be able to Understand the characteristics of linear time invariant systems.
			CO4: Students will be able to Analyze the signals with different transform technique
26	III-II	ENVIRONMENTAL SCIENCE	CO1: Students will be able to Understand the importance of ecological balance for sustainable development.
			CO2: Students will be able to Understand the impacts of developmental activities and mitigation measures
			CO3: Students will be able to Understand the environmental policies and regulations
			CO4: Students will be able to develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
27	IV-I	UTILIZATION OF ELECTRIC POWER (Open Elective II)	CO1: Student will be able to Understand basic principles of electric heating and welding
			CO2: Student will be able to Determine the lighting requirements for flood lighting, household and industrial needs
			CO3: Students will be able to Calculate heat developed in induction furnace.
			CO4: Students will be able to Evaluate speed time curves for traction
28	IV-I	ELECTRICAL AND HYBRID VEHICLES (Professional Elective III)	CO1: Students will be able to Understand the models to describe hybrid vehicles and their performance
			CO2: Students will be able to Understand the different possible ways of energy storage.
			CO3: Students will be able to Understand the different strategies related to energy storage systems.
29	IV-I	HVDC TRANSMISSION	CO1: Students will be able to Compare EHV AC and HVDC system and to describe various types of DC links
			CO2: Students will be able to Analyze Graetz circuit for rectifier and inverter mode of operation

		(Professional Elective IV)	CO3: Students will be able to Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems CO4: Students will be able to Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters
30	IV-I	FLEXIBLE AC TRANSMISSION	CO1: Student will be able to Choose proper controller for the specific application based on system requirements CO2: Student will be able to Understand various systems thoroughly and their requirements CO3: Student will be able to Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz. Transient stability Enhancement, voltage instability prevention and power oscillation damping CO4: Student will be able to Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC
31	IV-I	POWER QUALITY	CO1: Student will be able to Know the severity of power quality problems in distribution system CO2: Student will be able to Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage) CO3: Student will be able to Concept of improving the power quality to sensitive load by various mitigating custom power devices
32	IV-I	WIND, SOLAR AND HYBRID ENERGY SYSTEMS	CO1: Student will be able to Understand the energy scenario and the consequent growths of the power generate renewable energy sources CO2: Student will be able to Understand the basic physics of wind and solar power generation CO3: Student will be able to Understand the power electronic interfaces for wind and solar generation CO4: Student will be able to Understand the issues related to the grid-integration of solar and wind energy systems
33	IV-II	ARTIFICIAL NEURAL NETWORKS AND FUZZY SYSTEMS	CO1: Student will be able to To understand artificial neural network models and their training algorithms CO2: Student will be able to To understand the concept of fuzzy logic system components, fuzzification and defuzzification CO3: Student will be able to Apply the above concepts to real-world problems and applications
34	IV-II	MEASURING INSTRUMENTS (Open Elective III)	CO1: Student will be able to identify suitable sensors and transducers for real time applications CO2: Student will be able to translate theoretical concepts into working models CO3: Student will be able to understand the basic of measuring device and use them in relevant situation.
35	IV-II	POWER QUALITY AND FACTS (Professional Elective V)	CO1: Students will be able to Know the severity of power quality problems in distribution system CO2: Students will be able to Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage) CO3: Students will be able to Concept of improving the power quality to sensitive load by various mitigating

			<p>custom power devices</p> <p>CO4: Students will be able to Choose proper controller for the specific application based on system requirements</p> <p>CO5: Students will be able to Understand various systems thoroughly and their requirements</p> <p>CO6: Students will be able to Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz.</p> <p>CO7: Students will be able to Transient stability Enhancement, voltage instability prevention and power oscillation damping</p> <p>CO8: Students will be able to Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC</p>
36	IV-II	ELECTRICAL DISTRIBUTION SYSTEMS (Professional Elective VI)	<p>CO1: Student will be able to To distinguish between transmission, and distribution line and design the feeders</p> <p>CO2: Student will be able to compute power loss and voltage drop of the feeders</p> <p>CO3: Student will be able to design protection of distribution systemS</p> <p>CO4: Student will be able to understand the importance of voltage control and power factor improvement</p>
37	IV-II	DISASTER MANAGEMENT	<p>CO1: Student will be able to Understanding Disasters, man-made Hazards and Vulnerabilities</p> <p>CO2: Student will be able to Understanding disaster management mechanism</p> <p>CO3: Student will be able to Understanding capacity building concepts and planning of disaster managements</p>
38	IV-II	INDUSTRY ORIENTED MINI PROJECT	<p>CO1: Student will able to gather the requirements of the problem.</p> <p>CO2: Students will be able to analyze, design and develop the application, tool with the explored technologies.</p> <p>CO3: Students will be able to initiate efforts to solve real time problems</p>
39	IV-II	SEMINAR	<p>CO1: Students will be able to express and master public speaking during technical presentations.</p> <p>CO2: Students will be able to get an opportunity; where in individuals can meet others with the same Interests/problems/concerns and also to envisage emerging technologies.</p> <p>CO3: Students will be able to have a sense of renewed hope and inspiration, as sometimes business concerns are lessened by sharing experiences with others.</p> <p>CO4: Students will be able to have a great morale booster for students for career making advancement</p> <p>CO5: Students will be able to become speaker and it will motivate students in facing technical and HR interview rounds.</p> <p>CO6: Students will be able to meet industrial requirement and to improve technical interview skills of a student.</p>
40	IV-II	PROJECT WORK	<p>CO1: Students will be able to analyze a problem, identify and define the computing requirements appropriate to its solutions.</p> <p>CO2: Students will be able to function effectively on teams to accomplish a common goal.</p> <p>CO3: Students will be able to use current techniques, skill and tools necessary for computing practices.</p>

			<p>CO4: Students will be able to design and development principles in the construction of software systems of varying complexity.</p> <p>CO5: Students will be able to get an eye opener to bridge gap between Academia and real time industry issues on technological front</p> <p>CO6: Students will be able to meet industrial requirement and to improve technical interview skills of a student.</p>
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PRINCIPAL
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Mechanical Engineering I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No.	Year/Sem	Course Name	Course Outcomes
1	II-I	PROBABILITY AND STATISTICS & COMPLEX VARIABLES	CO1-Formulate and solve problems involving random variables and apply statistical methods for Analyzing experimental data.
			CO2-Analyse the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
			CO3-Taylor's and Laurent's series expansions of complex function.
			CO4-Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem
			CO5-The statistical methods of studying data samples.
2	II-I	MECHANICS OF SOLIDS	CO1-Analyze the behavior of the solid bodies subjected to various types of loading.
			CO2- Apply knowledge of materials and structural elements to the analysis of simple structures.
			CO3- Undertake problem identification, formulation and solution using a range of analytical methods.
			CO4-Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams.
			CO5- Expectation and capacity to undertake lifelong learning.
3	II-I	MATERIAL SCIENCE AND METALLURGY	CO1-Identify the properties of metals with respect to crystal structure and grain size .
			CO2- Interpret the phase diagrams of materials.
			CO3- Classify and Distinguish different types of cast irons, steels and nonferrous alloys.
			CO4- Describe the concept of heat treatment of steels & strengthening mechanisms.
			CO5- Explain the powder metallurgy process, types and manufacturing of composite materials.
4	II-I	PRODUCTION TECHNOLOGY	CO1- Understand the idea for selecting materials for patterns.
			CO2- Know Types and allowances of patterns used in casting and analyze the components of moulds.
			CO3- Design core, core print and gating system in metal casting processes
			CO4- Understand the arc, gas, solid state and resistance welding processes.
			CO5- Develop process-maps for metal forming processes using plasticity principles and Identify the effect of process variables to manufacture defect free products
5	II-I	THERMODYNAMICS	CO-1Understand and differentiate between different thermodynamic systems and process
			CO2- Understand and apply the laws of Thermodynamics to different types of systems.
			CO3-Undergoing various processes and to perform thermodynamic analysis.
			CO4- Understand and analyze the Thermodynamic cycles.

			CO5-Understand and evaluate Performance parameters
6	II-I	MACHINE DRAWING	CO1- Preparation of engineering and working drawings with dimensions and bill of material during design and development. Developing assembly drawings using part drawings of machine components.
			CO2- Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.
			CO3- Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned.
			CO4- Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centre's, curved and tapered features.
			CO5- Title boxes, their size, location and details - common abbreviations and their liberal usage
7	II-II	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	CO1- To analyze and solve electrical circuits using network laws and theorems.
			CO2- To understand and analyze basic Electric and Magnetic circuits
			CO3- To study the working principles of Electrical Machines.
			CO4- To introduce components of Low Voltage Electrical Installations.
			CO5- To identify and characterize diodes and various types of transistors.
8	II-II	KINEMATICS OF MACHINERY	CO1- Build up critical thinking and problem solving capacity of various mechanical engineering problems related to kinematics of machines.
			CO2- Asses various concepts of mechanisms like straight line motion mechanisms, Steering gear mechanisms.
			CO3- working principles of power elements (<i>Gears, gear trains, Cams, Belt and Chain drives</i>).
			CO4- Utilize analytical, mathematical and graphical aspects of kinematics of Machines for effective design.
			CO5- Design related problems effectively on (<i>Gears, gear trains, Cams, Belt and Chain drives</i>)
9	II-II	THERMAL ENGINEERING – I	CO-1 Evaluate the performance of IC engines and compressors under the given operating conditions.
			CO-2 Apply the laws of Thermodynamics to evaluate the performance of Refrigeration and air-conditioning cycles
			CO-3The functionality of the major components of the IC Engines
			CO-4 The functionality of the major components of the IC Engines and effects of operating conditions
			CO-5 The functionality of the major components of the IC Engines on their performance
10	II-II	FLUID MECHANICS AND	CO1- Able to explain the effect of fluid properties on a flow system.

		HYDRAULIC MACHINES	CO2- Able to identify type of fluid flow patterns and describe continuity equation CO3- To analyze a variety of practical fluid flow and measuring devices and utilize Fluid Mechanics principles in design. CO4- Able to explain the effect of fluid properties on a flow system. CO5- To analyze a variety of practical fluid flow and measuring devices and utilize fluid mechanics principles in design.
11	II-II	INSTRUMENTATION AND CONTROL SYSTEMS	CO1- To identify various elements and their purpose in typical instruments, to identify various errors that would occur in instruments. CO2- Analysis of errors so as to determine correction factors for each instrument CO3 To understand static characteristics of instrument and should be able to determine loading response time. CO-4 To understand dynamic characteristics of instrument and should be able to determine loading response time. CO5- For given range of displacement should be able to specify transducer, its accurate and loading time of that transducer.
12	III-I	DYNAMICS OF MACHINERY	CO1- Apply basic principles of mechanisms in mechanical systems. CO2- Perform static and dynamic analysis of simple mechanisms. CO3- Perform balancing of rotating and reciprocating masses. CO4- Model and analyze mechanical systems subjected to vibrations. CO5- Provide alternate design solutions based on requirement.
13	III-I	DESIGN OF MACHINE MEMBERS – I	CO1- The student acquires the knowledge about the principles of design subjected to loads, and criteria of failure. CO2- Understands the concepts of principal stresses, stress concentration in machine members and fatigue loading. CO3- The student acquires the knowledge about the principles of component behavior subjected to loads, and criteria of failure. CO4- Design on the basis of strength and rigidity and analyze the stresses and strains induced in a machine element. CO5-- Understands the concepts of stress concentration in machine members and fatigue loading.
14	III-I	METROLOGY AND MACHINE TOOLS	CO1-Identify techniques to minimize the errors in measurement. CO2- Identify methods and devices for measurement of length, angle, gear & thread parameters, surface roughness and geometric features of parts. CO3 Understand working of lathe, shaper, planer, drilling, milling and grinding machines. CO4- Comprehend speed and feed mechanisms of machine tools.

			CO5 Understand the principles of boiling, condensation and radiation heat transfer.
20	III-II	CAD & CAM	CO1- Understand geometric transformation techniques in CAD.
			CO2- Develop mathematical models to represent curves and surfaces.
			CO3- Model engineering components using solid modelling techniques.
			CO4- Develop programs for CNC to manufacture industrial components.
			CO5- To understand the application of computers in various aspects of Manufacturing viz., Design, Proper planning, Manufacturing cost, Layout & Material Handling system.
21	III-II	UNCONVENTIONAL MACHINING PROCESSES (Professional Elective - I)	CO1- Understand the basic techniques of Unconventional Machining processes modelling
			CO2- Understand the basic techniques of Unconventional modelling
			CO3- Estimate the material removal rate
			CO4- Estimate the material cutting force
			CO5- Unconventional Machining processes.
22	III-II	PRODUCTION PLANNING AND CONTROL (Professional Elective – I)	CO1- At the end of the course, the student will be able to understand production systems and their characteristics.
			CO2- Evaluate MRP and JIT systems against traditional inventory control systems.
			CO3- Understand basics of variability and its role in the aggregate planning strategies.
			CO4- Apply forecasting techniques to production systems. Understand theory of constraints for effective management of production systems.
			CO5- Apply scheduling techniques to production systems. Understand theory of constraints for effective management of production systems.
23	III-II	FINITE ELEMENT METHODS	CO1- At the end of the course, the student will be able to, Apply finite element method to solve problems in fluid mechanics.
			CO2- At the end of the course, the student will be able to, Apply finite element method to solve problems in solid mechanics.
			CO3- At the end of the course, the student will be able to, Apply finite element method to solve problems in heat transfer.
			CO4- Formulate and solve problems in one dimensional structures including trusses, beams and frames.
			CO5- Formulate FE characteristic equations for two dimensional elements and analyze plain stress, plain strain, axisymmetric and plate bending problems. ANSYS, ABAQUS, NASTRAN, etc.
24	IV-I	CAD/CAM	CO1- Understand geometric transformation techniques in CAD.
			CO2- Develop mathematical models to represent curves and surfaces.
			CO3- Model engineering components using solid modelling techniques.

			CO4- Develop programs for CNC to manufacture industrial components.
			CO5- To understand the application of computers in various aspects of Manufacturing viz., Design, Proper planning, Manufacturing cost, Layout & Material Handling system.
25	IV-I	INSTRUMENTATION AND CONTROL SYSTEMS	CO1- To identify various elements and their purpose in typical instruments.
			CO2- To identify various errors that would occur in instruments.
			CO3- Analysis of errors so as to determine correction factors for each an instrument.
			CO4- To understand static and dynamic instrument and should be able to determine loading response time.
			CO5- For given range of displacement should be able to specify transducer, its accurate and loading time of that transducer.
26	IV-I	COMPOSITE MATERIALS (Professional Elective - II)	CO1-. Some understanding of types, manufacturing processes, of composite materials.
			CO2- Ability to analyze problems on macromechanical behavior of lamina .
			CO3- Ability to analyze problems on macromechanical behavior of laminate.
			CO4. Some understanding and applications of composite materials.
			CO5- Ability to analyze problems on bending, buckling, and vibration of laminated plates and beams.
27	IV-I	POWER PLANT ENGINEERING(PE – II)	CO1- Understand the concept of Rankine cycle.
			CO2- Understand working of boilers including water tube, fire tube and high pressure boilers and determine efficiencies.
			CO3-Analyze the flow of steam through nozzles.
			CO4- Evaluate the performance of condensers and steam turbines
			CO5- Evaluate the performance of gas turbines.
28	IV-I	ROBOTICS (Professional Elective - III)	CO1- At the end of the course, the student will be able to understand the components of robots.
			CO2- Differentiate types of robots and robot grippers
			CO3- Model forward and inverse kinematics of robot manipulators.
			CO4-:Analyze forces in links and joints of a robot, Programme a robot to perform tasks in industrial applications.
			CO5- Design intelligent robots using sensors.
29	IV-I	CNC TECHNOLOGY (Professional Elective – III)	CO1- Create and prove “G” code programs to machine parts on a CNC turning center and a CNC milling center that meet the part specification.
			CO2- Design, build, and troubleshoot hydraulic or pneumatic powered machine, based on basic physics principals that apply to fluid power.
			CO3-.Rate an industrial process to decide if it qualifies as an automation or robotic work cell based

			on principles of Computer Integrated Manufacturing.
			CO4- Compose state diagrams based on machine mechanisms and operating sequences, flow charts, and PLC ladder programs that meet OSHA safety requirements.
			CO5- Prepare basic CAD schematics and drawings for electrical control, fluid power, PLC and I/O wiring, and mechanical systems.
30	IV-I	ADDITIVE MANUFACTURING TECHNOLOGY (Professional Elective – IV)	CO1- Describe various CAD issues for 3D printing and rapid prototyping and related operations for STL model manipulation.
			CO2- Formulate and solve typical problems on reverse engineering for surface reconstruction from physical prototype models through digitizing and spline-based surface fitting.
			CO3- Formulate and solve typical problems on reverse engineering for surface reconstruction from digitized mesh models through topological modelling and subdivision surface fitting.
			CO4- Explain and summarize the principles and key characteristics of additive manufacturing technologies and commonly used 3D printing and additive manufacturing systems.
			CO5- Explain and summarize typical rapid tooling processes for quick batch production of plastic and metal parts.
31	IV-I	TURBO MACHINES (Professional Elective –IV)	CO1-Ability to design and calculate different parameters for turbo machines.
			CO2- Prerequisite to CFD and Industrial fluid power courses.
			CO3- Ability to formulate design criteria
			CO4- Ability to understand thermodynamics a behind turbo machines
			CO5- Ability to understand kinematics behind turbo machines
32	IV-I	MINI PROJECT	CO1- Conduct a survey of several available literature in the preferred field of study.
			CO2- Compare and contrast the several existing solutions for research challenge.
			CO3- Demonstrate an ability to work in teams and manage the conduct of the research study.
			CO4- Formulate and propose a plan for creating a solution for the research plan identified.
			CO5- To report and present the findings of the study conducted in the preferred domain.
33	IV-II	FLUID POWER SYSTEM (Professional Elective - V)	CO1- Understand the Properties of fluids, Fluids for hydraulic systems,
			CO2-Governing laws. distribution of fluid power,
			CO3-Design and analysis of typical hydraulic circuits.
			CO4-Know accessories used in fluid power system and Filtration systems of system.
			CO5-Know accessories used in maintenance of system.
34	IV-II	RENEWABLE ENERGY SOURCES (Professional Elective -V)	CO1-Understanding of renewable energy sources.
			CO2-Knowledge of working principle of various energy systems.
			CO3-Capability to carry out basic design of renewable energy systems.

			CO4-. Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
			CO5- Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications .
35	IV-II	PRODUCTION PLANNING AND CONTROL (Professional Elective – V)	CO1-To Know production systems and their characteristics.
			CO2-Evaluate MRP and JIT systems against traditional inventory control systems.
			CO3-Understand basics of variability and its role in the performance of a production system.
			CO4-Analyze aggregate planning strategies. Apply forecasting and scheduling techniques to production systems.
			CO5-Understand theory of constraints for effective management of production systems.
36	IV-II	ADVANCED MECHANICS OF SOLIDS (Professional Elective - VI)	CO1-Determined the point of location of applied load to avoid twisting in thin sections used in aerospace applications.
			CO2-Understand the concept of distinguish between neutral axis in curved beams.
			CO3-Understand the concept of distinguish between centroidal axis in curved beams.
			CO4-Understanding the analogy models developed for analyzing the non circular bars subjected to torsion.
			CO5-Analyzing the stresses developed between rolling bodies and stress in three dimensional bodies.
37	IV-II	UNCONVENTIONAL MACHINING PROCESSES (Professional Elective - VI)	CO1-Understand the basic techniques of machining processes modelling.
			CO2-Understand the mechanical aspects of orthogonal cutting mechanics.
			CO3-Understand the thermal aspects of orthogonal cutting mechanics.
			CO4-Ability to extend, through modeling techniques, the single point, multiple point and abrasive machining processes.
			CO5-Estimate the material removal rate and cutting force, in an industrially useful manner for practical machining processes.
38	IV-II	MAJOR PROJECT	CO1- Demonstrate a sound technical knowledge of their selected project topic .
			CO2- Undertake problem identification, formulation and solution.
			CO3- Design engineering solutions to complex problems utilizing a systems approach.
			CO4- Communicate with engineers and the community at large in written and oral forms.
			CO5- Demonstrate the knowledge, skills and attitudes of a professional engineer.

Electronics and Communications Engineering I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No	Yea/ Sem	Course Name	Course Outcomes
1	II-I	Electronic Devices & Circuits	CO1: Study and analyze the behavior of semiconductor devices
			CO2: Characterize the current flow of a bipolar transistor in CB,CE and CC configurations
			CO3: Bias the transistors and FETs for amplifier applications
			CO4: Realize simple amplifier circuits using BJT and FET
			CO5: Design half wave and full wave rectifiers with filters
2	II-I	Digital System Design	CO1: Able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, gray, and BCD
			CO2: Able to design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits
			CO3: Able to design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits
			CO4: Able to design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits
			CO5: Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors and design different types of logic gates using CMOS and analyze their transfer characteristics
3	II-I	Network Analysis & Transmission Theory	CO1: Understand the concept of impedance matching and its significance
			CO2: Design filters and equalizers for given applications.
			CO3: Analyze and interpret the voltage and current distributions on the transmission lines.
			CO4: Determine the various parameters such as Z, Y, ABCD & h parameters of the two port network and design different types of attenuators
			CO5: Use the smith chart as a graphical tool to solve impedance matching issues.
4	II-I	Probability Theory and Stochastic Process	CO1: Distinguish between random and stochastic processes
			CO2: Model communication system as a stochastic process
			CO3: Characterize LTI systems driven by a stationary random process using autocorrelation and power spectral density functions
			CO4: Understand the probability distribution functions of noise in a communication link.
			CO5: Analysis of random process and its applications to various fields
5	II-I	Signals and Systems	CO1: Classify the signals as Continuous time and Discrete time
			CO2: Analyze the spectral characteristics of signals using Fourier analysis

			CO3: Classify systems based on their properties and determine the response of LTI system using convolution.
			CO4: Identify system properties based on impulse response and Fourier analysis
			CO5: Apply transform techniques to analyze continuous-time and discrete-time signals and systems.
6	II-II	Laplace Transforms, Numerical Methods & Complex Variables	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2: Find the root of a given equation and estimate the value for the given data using interpolation
			CO3: Find the numerical solutions for a given ODE's
			CO4: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
			CO5: Taylor's and Laurent's series expansions of complex Function
7	II-II	Electromagnetic Fields and Waves	CO1: Students Will Be Able To Apply Maxwell's Equations To Stationary And Time-Harmonic Fields.
			CO2: Students Will Be Able To Characterize Uniform Plane Waves In Free Space And Different Types Of Media
			CO3: Students Will Be Able To Solve Problems Of Wave Reflection And Transmission At Interfaces And The Concepts Of Propagation Of Guided Waves, Power Flow By Poynting's Theorem And Applications
			CO4: Analyzing the behavior of EM waves at different boundaries
			CO5: Students Will Be Able To Competent Enough To Learn Subjects Like Antennas, Microwave Engineering, Radar Systems And Wireless Communication And Research Activities Can Be Pursued With Knowledge
8	II-II	Analog and Digital Communications	CO1: Analyze and design of various continuous wave and angle modulation and demodulation techniques
			CO2: Understand the effect of noise present in continuous wave and angle modulation techniques
			CO3: Attain the knowledge about AM , FM Transmitters and Receivers
			CO4: Analyze and design the various Pulse Modulation Techniques
			CO5: Understand the concepts of Digital Modulation Techniques and Baseband transmission
9	II-II	Linear IC Applications	CO1: Design op-amp circuits to perform arithmetic operations.
			CO2: Analyze and design linear and non-linear applications using op-amp
			CO3: Analyze and design oscillators and filters using functional ICs.
			CO4: Choose appropriate A/D and D/A converters for signal processing applications.
			CO5: Design various Combinational & Sequential logic circuits using Digital IC's
10	II-II	Electronic Circuit Analysis	CO1: To Understand the biasing technique of amplifier
			CO2: To Analyze the small signal equivalent circuit of transistor
			CO3: To Analyze the frequency response of amplifier
			CO4: To Understand the different types of large signal amplifier.
			CO5: To Study of rectifiers and power supplies
11	III-I	Microprocessor	CO1: To understand the internal architecture and organization of 8086 and Assembly Language Programming of 8086

		And Microcontroller	<p>CO2: To understand the internal architecture and organization of 8051 and interrupts concept</p> <p>CO3: Able to analyze different types of interfaces with 8051 and their working</p> <p>CO4: To understand the ARM processors fundamentals, Architecture and their different instruction sets</p> <p>CO5: Able to analyze the CORTEX Processor & OMAP processors architectures</p>
12	III-I	Data Communication & Networks	<p>CO1: Understand the concept data communication within the network environment</p> <p>CO2: Understand the terminology and concepts of the OSI reference model and the TCP-IP reference model</p> <p>CO3: Understand the conflicting issues and resolution techniques in data transmission</p> <p>CO4: Understand the basic principles of network design</p> <p>CO5: Describe the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks</p>
13	III-I	Control Systems	<p>CO1: Students Can Improve The System Performance By Selecting A Suitable Controller And/Or A Compensator For A Specific Application</p> <p>CO2: Students Can Able To Apply Various Time Domain And Frequency Domain Techniques To Assess The System Performance</p> <p>CO3: Students Can Able To Apply Various Control Strategies To Different Applications (Example: Power Systems, Electrical Drives Etc...)</p> <p>CO4: To assess the system performance using frequency domain analysis and techniques for improving the performance</p> <p>CO5: Students Can Able To Test System Controllability And Observability Using State Space Representation And Applications Of State Space Representation To Various Systems.</p>
14	III-I	Business Economics And Financial Analysis	<p>CO1: Students Will Be Able To Apply Concepts Of Business Economics, Roles And Responsibilities Of Manager And Relation Of Business Economics With Other Disciplines.</p> <p>CO2: Students Will Be Able To Identify The Roles And Responsibilities Of A Manager.</p> <p>CO3: Students Will Be Able To Identify The Demand And Supply Of A Product And Factors Relating To It.</p> <p>CO4: Students Will Be Able To Exploring The Importance Of Pricing Strategies And Price Fixation.</p> <p>CO5: Students Will Be Able To Design Various Demand Forecasting Methods Of Products.</p>
15	III-I	Computer Organization & Operating Systems	<p>CO1: Ability to Demonstrate an understanding of the design of the functional units of a digital computer system</p> <p>CO2: Ability to Recognize and manipulate representations of numbers stored in digital computers and perform Basic arithmetic Operations</p> <p>CO3: Able to explain the basic concepts of operating systems</p> <p>CO4: Able to compare different process scheduling algorithms and interpret the concurrency problem to overcome it by using different solutions</p> <p>CO5: Able to analyze sharing of resources among multiple processes in order to detect, prevent and avoid</p>

			a deadlock
16	III-II	Java Programming	CO1: Students Can Apply Object Oriented Concept For Writing Simple Programs.
			CO2: Students Can Able To Apply The Exception Handling Technique For Writing User Defined Exceptions In Program.
			CO3: Students Can Able To Connect To Database From Java Program Through JDBC.
			CO4: Students Can Able to develop multithreaded applications with synchronization
			CO5: Students Can Able To Write GUI Based Program By Using Applet.
17	III-II	Embedded System & Design	CO1: Students Will Be Able To Understand And Design Embedded Systems
			CO2: Students Will Be Able To Understand Types Of Memory And Interfacing To External World
			CO3: Students Will Be Able To Learn Basic OS And RTOS
			CO4: Students Will Be Able To Understand Embedded Firmware Design Approaches.
			CO5: Analyze and develop embedded hardware and software development cycles and tools
18	III-II	Antennas And Wave Propagation	CO1: Students Able To Aware Of The Parameter Considerations Viz. Antenna Efficiency, Beam Efficiency Radiation Resistance Etc.. In The Design Of An Antenna.
			CO2: Students Capable To Analyze The Designed Antenna And Field Evaluation Under Various Conditions And Formulate The Electric As Well As The Magnetic Fields Equation Set For Far Field And Near Field Conditions.
			CO3: Students Able To Understand The Array System Of Different Antennas And Field Analysis Under Application Of Different Currents To The Individual Antenna Elements.
			CO4: To understand the concepts and set-up requirements for microwave measurements, and familiarize with the procedure to enable antenna measurements.
			CO5: Students Able To Understand The Design Issues, Operation Of Fundamental Antennas Like Yagi – Uda, Horn Antennas And Helical Structure And Also Their Operational Methodology In Practice And Knowledge About The Means Of Propagation Of EM Wave.
19	III-II	VLSI Design	CO1: Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors
			CO2: Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
			CO3: Design and implement different types of logic gates using CMOS inverter and analyze their transfer characteristics
			CO4: Provide design concepts required to design building blocks of data path using gates
			CO5: Design simple memories using MOS transistors and Design simple logic circuit using PLA, PAL, FPGA and CPLD, and know the Faults
20	III-II	Digital Signal Processing	CO1: Students Will Able To Implement Discrete Fourier Transforms (Dft) And Fast Fourier Transform (Fft) To Analyze The Input Signal And Design A Processing System To Give The Desired Output In The Design Of A Dsp System

			CO2: Students Will Able To Use FFT Algorithms In Rapid Frequency-Domain Analysis And Processing Of Digital Signals And Investigation Of Digital Systems.
			CO3: Students Will Able To Design IIR Filters To Meet Specific Magnitude And Phase Requirements
			CO4: Students Will Able To Design FIR Filters To Meet Specific Magnitude And Phase Requirements
			CO5: Students Will Able To Realize IIR And FIR Filters Using Direct Forms, Cascade And Parallel Forms
21	III-II	Entrepreneurship	CO1: It enables students to learn the basics of Entrepreneurship
			CO2: It enables students to entrepreneurial development which will help them to provide vision for their own Start-up.
			CO3: Student will be able to Managing Marketing and Growth of Enterprises
			CO4: Student will be able to know the Strategic perspectives in Entrepreneurship
			CO5 : Student will be able to know New Venture Creation concepts
22	IV- I	Electronic Measurements And Instrumentation	CO1: Student Will Be Able To Explain The Fundamental Concepts And Principles Of Instrumentation
			CO2: Student Will Be Able To Demonstrate The Operations Of The Various Instruments Required In Measurements
			CO3: Student Will Be Able To Apply The Measurement Techniques For Different Types Of Tests. To Select Specific Instrument For Specific Measurement Function.
			CO4: Student Will Be Able To Explain The Principle Of Operation, Working Of Different Electronic Instruments Like Digital Multi Meter, Vector Voltmeter
			CO5: Student Will Be Able To Apply Knowledge Of Different Oscilloscopes Like CRO, DSO
23	IV- I	Microwave Engineering	CO1: Students Will Able To Describe The Significance Of Microwaves And Transmission Lines
			CO2: Students Will Able To Analyze The Characteristics Of Microwave Tubes And Compare Them
			CO3: Students Will Able To List And Explain The Various Microwave Solid State Devices
			CO4: To impart the knowledge of Scattering Matrix, its formulation and utility, and establish the S-Matrix for various types of microwave junctions
			CO5: Students Will Able To Set Up A Microwave Bench For Measuring Microwave Parameters
24	IV- I	Computer Networks	CO1: Students Will Be Able To Analyze Data Communications System And Its Components
			CO2: Students Will Be Able To Identify The Different Types Of Network Topologies And Protocols
			CO3: Students Will Be Able To Enumerate The Layers Of The OSI Model And TCP/IPL Explain The Function(S) Of Each Layer
			CO4: Students Will Be Able To Build The Skills Of Sub Netting And Routing Mechanisms
			CO5: Students able to Analyze different routing Techniques
25	IV- I	VLSI Design	CO1: Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors
			CO2: Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
			CO2: Discuss the techniques of chip design using programmable devices

			CO4: Provide design concepts required to design building blocks of data path using gates CO5: Design simple memories using MOS transistors and Design simple logic circuit using PLA, PAL, FPGA and CPLD, and know the Faults
26	IV- I	Wireless Communications and Networking	CO1: The Student Will Be Able To Understand The Principles Of Wireless Communications CO2: The Student Will Be Able To Understand Fundamentals Of Wireless Networking CO3: The Student Will Be Able To Understand Cellular System Design Concepts CO4: The Student Will Be Able To Analyze Various Multiple Access Schemes Used In Wireless Communication. CO5: The Student Will Be Able To Understand Wireless Wide Area Networks And Their Performance Analysis
27	IV-II	Optical Communications	CO1: Identify and characterize different components of an Optical Fiber Communication link. CO2: Analyze optical source, Fiber and Detector operational parameters CO3: Analyze the various light sources like LED and LASER and their working CO4: Compute optical fiber link design parameters CO5: Understand WDM, Optical Amplifiers, Optical Switching and networking technology concepts.
28	IV-II	Global Positioning System	CO1: Identify GPS components and their functions CO2: Select GPS survey method CO3: Interpret the navigational message and signals received by the GPS satellite CO4: Identify error sources in GPS observations, and apply the corrections for accurate positioning CO5: Map the geospatial features
29	IV-II	Linux Programming	CO1: Students will be able to understand the basic commands of linux operating system and can write shell scripts CO2: Students will be able to create file systems and directories and operate them CO3: Students will be able to create processes background and fore ground etc..by fork() system calls CO4: Students will be create shared memory segments, pipes ,message queues and can exercise interprocess communication CO5: Design various client server applications using TCP or UDP protocols.
30	IV-II	Industry oriented Mini Project	CO1: Student will able to gather the requirements of the problem. CO2: Students will be able to analyze, design and develop the application, tool with the explored technologies. CO3: Students will be able to initiate efforts to solve real time problems CO4: Summarize the fundamental concepts and techniques used in mini project CO5: Make up project enables the student to understand the business process
31	IV-II	Seminar	CO1: Students will be able to express and master public speaking during technical presentations. CO2: Students will be able to get an opportunity; where in individuals can meet others with the same Interests/problems/concerns and also to envisage emerging technologies.

			CO3: Students will be able to have a sense of renewed hope and inspiration, as sometimes business concerns are lessened by sharing experiences with others.
			CO4: Students will be able to have a great morale booster for students for career making advancement
			CO5: Students will be able to become speaker and it will motivate students in facing technical and HR interview rounds.
32	IV-II	Project work	CO1: Students will be able to analyze a problem, identify and define the computing requirements appropriate to its solutions.
			CO2: Students will be able to function effectively on teams to accomplish a common goal.
			CO3: Students will be able to use current techniques, skill and tools necessary for computing practices.
			CO4: Students will be able to design and development principles in the construction of software systems of varying complexity.
			CO5: Students will be able to get an eye opener to bridge gap between Academia and real time industry issues on technological front


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Computer Science and Engineering I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No	Year/Sem	Course Name	Course Outcomes
1	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.
			CO5: Design programs using a variety of tries, heaps, graphs, and AVL-trees.
2	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: Recognize and manipulate representations of numbers stored in digital computers
			CO5: Design a pipeline for consistent execution of instructions with minimum hazards.
3	II-I	Object Oriented Programming using C++	CO1: Able to develop programs with reusability
			CO2: Develop programs for file handling
			CO3: Develop applications for a range of problems using object-oriented programming techniques
			CO4: Understanding the concepts of Stream I/O
			CO5: Handle exceptions in programming
4	II-I	Analog and Digital Electronics	CO1: Know the characteristics of various components.
			CO2: Understand the utilization of components.
			CO3: Design and analyze small signal amplifier circuits
			CO4: Learn Postulates of Boolean algebra and to minimize combinational functions
			CO5: Design and analyze combinational and sequential circuits
5	II-I	Computer Oriented Statistical Methods	CO1: To Learn techniques to calculate the measures of central tendency and different measures of dispersion techniques and processing samples using sampling techniques
			CO2: To gain insight into consequences of plan by probability
			CO3: Drawing valid conclusion using estimation theory and proper decision using decision theory
			CO4: To measure experimental result based on hypothesis using chi square techniques
			CO5: To learn techniques to correlate the relationship between various variables
7	III-I	Computer	CO1: Gain the knowledge of the basic computer network technology.

		Networks	CO2. Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model. CO3. Obtain the skills of subnetting and routing mechanisms. CO4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation. CO5: Understand the Domain Name System
8	III-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: Understanding Software Requirements CO3: Apply Product Metrics CO4: 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. CO5: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
9	III-I	Web Technologies	CO1. gain knowledge of client-side scripting, validation of forms and AJAX programming CO2. understand server-side scripting with PHP language CO3. understand what is XML and how to parse and use XML Data with Java CO4. To introduce Server-side programming with Java Servlets and JSP CO5: To introduce Client side scripting
10	III-I	Principles of Programming Languages	CO1: Acquire the skills for expressing syntax and semantics in formal notation CO2: Identify and apply a suitable programming paradigm for a given computing application CO3: Gain knowledge of and able to compare the features of various programming languages CO4: Combine the constructs for programming structures with efficiently using oops, concurrency management and event handling CO5: Demonstrate the working of functional and logic programming language.
11	III-I	Formal Languages & Automata Theory	CO1: Able to understand the concept of abstract machines and their power to recognize the languages. CO2: Able to employ finite state machines for modeling and solving computing problems. CO3: Able to design context free grammars for formal languages. CO4: Able to distinguish between decidability and undecidability. CO5: Able to gain proficiency with mathematical tools and formal methods.
12	III-I	Informational Retrieval Systems	CO1: Ability to apply IR principles to locate relevant information large collections of data CO2: Ability to design different document clustering algorithms

			CO3:Design the method to build inverted index.
			CO4:Implement retrieval systems for web search tasks.
			CO5:Design an Information Retrieval System for web search tasks.
13	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: Choose and employ suitable data mining algorithms to build analytical applications
			CO5:Evaluate the accuracy of supervised and unsupervised models and algorithms.
14	IV-I	Cloud Computing	CO1:Ability to understand various service delivery models of a cloud computing architecture
			CO2:Ability to understand the ways in which the cloud can be programmed and deployed.
			CO3:Understanding cloud service providers
			CO4:Analyze the impact of Cloud Computing on organizations and strategy.
			CO5:Learns the various marketing strategies for an online business.
15	IV-I	Software Process and Project Management	CO1: Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation
			CO2:Design and develop software product using conventional and modern principles of software project management
			CO3: Analyze the major and minor milestones, artifacts and metrics from management and technical perspective
16	IV-I	Principles of Programming Languages	CO1: Acquire the skills for expressing syntax and semantics in formal notation
			CO2: Identify and apply a suitable programming paradigm for a given computing application
			CO3:Gain knowledge of and able to compare the features of various programming languages
			CO4:Combine the constructs for programming structures with efficiently using oops,concurrency management and event handling
			CO5:Demonstrate the working of functional and logic programming language.
17	IV-I	Python Programming	CO1:Examine Python syntax and semantics and be fluent in the use of Python Basic types and functions.
			CO2:Demonstrate proficiency in handling Exceptions, Modules and Files.
			CO3:Create, run and manipulate Python Multithreading programs and use Regular Expressions.
			CO4:Implement GUI Applications related to Web Services in Python.
			CO5:Develop exemplary applications related to Databases.
18	II-II	Discrete	CO1:Ability to understand and construct precise mathematical proofs

		Mathematics	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
19	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: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively. CO5: Understanding File System Structure and Directory Structure
20	II-II	Business Economics & Financial Analysis	CO1: The students will understand the various Forms of Business. CO2: The students will understand the various Forms Of the impact of economic variables on the Business. CO3: The students will understand the various Forms Of The Demand, Supply and Production. CO4: Cost, Market Structure, Pricing aspects are learnt. CO5: The Students can study the firm's financial position by analysing the Financial Statements of a Company.
21	II-II	Database Management Systems	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms CO2: Master the basics of SQL for retrieval and management of data CO3: Understands the need of normalization, Normal forms I,II,III,IV BCNF CO4: Be acquainted with the basics of transaction processing and concurrency control. CO5: Familiarity with database storage structures and access techniques
22	II-II	Object Oriented Programming using Java	CO1: Able to apply object oriented programming features and concepts for solving real word problems. CO2: Demonstrate proficiency in handling packages and files in java. CO3: Create multithreading applications with Exception Handling and Synchronization. CO4: Solve the real time problems using java collection framework and utility classes. CO5: Able to design and develop applets for web applications and GUI based applications.
23	III-II	Constitution of India	CO1: Able to understand the concept of abstract machines and their power to recognize the languages. CO2: Able to employ finite state machines for modeling and solving computing problems CO3: Able to design context free grammars for formal languages. CO4: Able to distinguish between decidability and undecidability. CO5: Able to gain proficiency with mathematical tools and formal methods.

24	III-II	Compiler Design	CO1 :Demonstrate the the knowledge of patterns, tokens & regular expressions for lexical analysis.
			CO2 Acquire skills in using lex tool & yacc tool for develeoping a scanner and parser.
			CO3:Design and implement LL and LR parsers
			CO4:Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
			CO5: Design algorithms to generate machine code.
25	III-II	Machine Learning	CO1:Understand the concepts of computational intelligence like machine learning
			CO2:Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
			CO3: Understand the Neural Networks and its usage in machine learning application.
			CO4:Implement rule based learning and analytical learning strategies to solve complex problems.
			CO5:Combine inductive learning with analytical learning and deploy Reinforcement learning which supports dynamic programming.
26	III-II	Design and Analysis of Algorithms	CO1:Analyze algorithms and improve the efficiency of algorithm for the divide and conquer method.
			CO2:Apply backtracking method and disjoint set approach to improve the performance of an algorithm
			CO3:Evaluate the solution for the problem using dynamic method.
			CO4:Apply greedy method as solution for appropriate problems.
			CO5:Describe the notions of P, NP, NP-complete and NP-hard and apply branch and bound method appropriately.
27	III-II	Cyber Security	CO1:The students will be able to understand cyber-attacks, types of cybercrimes, cyber laws and also how to protect them self and ultimately the entire Internet community from such attacks.
			CO2:Demonstrate cybercrimes and how they are planned
			CO3:Develop a framework to secure Mobile and wireless devices
			CO4:Interpret crimes and Acts related to mobile and wireless devices
			CO5:Memorize Computer Forensics and its related matters
28	III-II	Mobile Application Development	CO1: Ability to evaluate and select appropriate solutions to the mobile computing plat form.
			CO2: Ability to develop the user interface
			CO3: Ability to design a simple mobile phone game
29	III-II	Environmental Science	CO1:Get the information about ecosystem and also about its functions like Food chain, Ecological pyramids etc.
			CO2:Get the knowledge about the different types of resources like land, water, mineral and energy and also about the effects of environment by the usage of these resources.

			CO3:Gain the knowledge about the ecosystem diversity, its values and also about the importance of the endemic species and different techniques involved in its conservation
			CO4:Gain the knowledge about the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.
			CO5:Get the complete information about EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations, awareness among people about protection of wild life, forest and other natural resources.
30	IV-II	Modern Software Engineering	CO1:Describe the need of Agile, agile methods and extreme programming concepts.
			CO2:Demonstrate the collaboration process of software engineering.
			CO3:Illustrate the Release process of software engineering
			CO4:Enumerate the planning process of software engineering
			CO5:Interpret the process of developing a software product including testing process and performance optimization.
31	IV-II	Industry oriented Mini Project	CO1: Student will able to gather the requirements of the problem.
			CO2: Students will be able to analyze, design and develop the application, tool with the explored technologies.
			CO3: Students will be able to initiate efforts to solve real time problems
32	IV-II	Seminar	CO1: Students will be able to express and master public speaking during technical presentations.
			CO2: Students will be able to get an opportunity; where in individuals can meet others with the same Interests/problems/concerns and also to envisage emerging technologies.
			CO3: Students will be able to have a sense of renewed hope and inspiration, as sometimes business concerns are lessened by sharing experiences with others.
			CO4: Students will be able to have a great morale booster for students for career making advancement
			CO5: Students will be able to become speaker and it will motivate students in facing technical and HR interview rounds.
33	IV-II	Project work	CO1: Students will be able to analyze a problem, identify and define the computing requirements appropriate to its solutions.
			CO2: Students will be able to function effectively on teams to accomplish a common goal.
			CO3: Students will be able to use current techniques, skill and tools necessary for computing practices.
			CO4: Students will be able to design and development principles in the construction of software systems of varying complexity.
			CO5: Students will be able to get an eye opener to bridge gap between Academia and real time industry issues on technological front

Humanity & Sciences I & II Sem Course Outcomes for the Academic Year 2020-2021

S.No	Year/Sem	Course Name	Course Outcomes
1	I/I	Mathematics-1 (Ma101bs)	CO1:Student will be able to solve the system of linear equations by representing them in matrix form and analyze its solution which requires in engineering problems
			CO2:Student will be able to solve the Eigen values and Eigen vectors & reduce the quadratic form to canonical form using orthogonal transformations
			CO3:Analyse the nature of sequence and series
			CO4:Mean value theorem, Beta & Gamma functions, its application in Engineering
			CO5:Extreme values of functions of two variables with/ without constraints
2	I/I	Engineering Physics (Ph102bs)	CO1:Students should be able to analyze situations in which a particle remains at rest, or moves with constant velocity, under the influence of several forces and understand the significance of the coefficient of friction.
			CO2:Students should be able to apply their knowledge of simple harmonic motion to the case of a pendulum KE, PE and TE of a mechanical system undergoing SHM
			CO3:Students should understand the difference between transverse and longitudinal waves how it propagates and to understand the phenomena of reflection, refraction, transmission and absorption.
			CO4:Students should understand the interference and diffraction of waves, so that they can determine locations of interference maxima or minima for two sources or determine the frequencies or wavelengths that can lead to constructive or destructive interference at a certain point.
			CO5:Students should be able to Understand, describe, analyze, and compare the most important devices: light sources, fibres and detectors from both physical and system point of view.
3	I/I	Programming For Problem Solving (Cs103es)	CO1:Develop the flow charts and algorithms, and then implement, compile and debug programs in C language for solving a problem
			CO2:Design programs involving decision structures, loops for problem solving
			CO3:Design programs to develop applications using array data structure
			CO4:Solve scientific problems using functions
			CO5:Make use of pointers to design applications for efficient and dynamic memory allocation
4	I/I	Engineering Graphics (Me104es)	CO1:Able to cognize the usage of drawing instruments, importance of engineering curves, scales and their construction
			CO2:Able to sketch the working drawings as per the principles of projections
			CO3:Cognize the sectional views of sectioned components in part drawings
			CO4:Develop the surfaces of geometrical solids and able to differentiate the curves of intersection, when interpenetrated
			CO5:Preparing working drawings to communicate the ideas and information by using conventional method

			and AutoCAD.
5	I/I	Engineering Physics Lab (Ph105bs)	CO1:To develop experimentation skills and understand importance of measurement practices in Science & Technology
			CO2:Develop analytical skills for interpreting data and drawing inferences.
			CO3:Understand nature of experimental errors and practical means to estimate errors in acquired data
			CO4:Develop skills for team work and technical communication and discussions.
			CO5:Apply theoretical principles of modern physics to analysis and measurements performed in the laboratory
6	I/I	Programming For Problem Solving Lab (Cs106es)	CO1:Implement, compile and debug programs in C language for solving a problem
			CO2:Design programs involving decision structures, loops for problem solving
			CO3:Design programs to develop applications using array data structure
			CO4:Apply functions to solve real world problems
			CO5:Make use of pointers to design applications with efficient use of memory
7	I/I	Environmental Science (Mc109es)	CO1:understand technologies on the basis of ecological principles principles and environmental regulations
			CO2:evaluate technologies on the basis of ecological principles principles and environmental regulations
			CO3:develop technologies on the basis of ecological principles principles and environmental regulations
			CO4:understand the impacts of developmental activities and mitigation measures
			CO5:understand the importance of ecological balance for sustainable development
8		Applied Physics (Ap102bs)	CO1:The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
			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.
			CO3:Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
			CO4:Students will be able to demonstrate competency and understanding of the concepts found in Fiber optics and lasers.
			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.
9	I/II	Mathematics-II (Ma201bs)	CO1: Able to identify Differential Equations by choosing the right method in different engineering problems.
			CO2:Solve higher differential equation and apply the concept of differential equation to real world problems
			CO3:Multiple integrals and can apply these concepts to find the area and volume of various regions using double and triple integrals.
			CO4: To learn fundamental vector calculus apply those logics in the fields like gravitation and electric fields
			CO5:to evaluate the line, surface and volume integrals and converting them from one to another

10	I/II	Chemistry (Ch202bs)	CO1:The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
			CO2:The knowledge of the basic properties of water and its usage in domestic and industrial purposes.
			CO3:Students will gain the basic knowledge of electrochemical procedures related to corrosion and its control.
			CO4:The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
			CO5:The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
11	I/II	Engineering Workshop (Me205es)	CO1:Study and practice on machine tools and their operations
			CO2:Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
			CO3:Identify and apply suitable tools for different trades of Engineering processes including, drilling, material removing, measuring, chiseling.
			CO4:Apply basic electrical engineering knowledge for house wiring practice
			CO5:Preparing the specimens as per the given dimensions.
12	I/II	English (En205hs)	CO1:Use English Language effectively in spoken and written forms.
			CO2:Comprehend the given texts and respond appropriately.
			CO3:Communicate confidently in various contexts and different cultures
			CO4:Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
			CO5:write a paragraph with a topic sentence, support, and concluding sentence
13	I/II	English Language And Communication Skills Lab (En207hs)	CO1:Insight of English language through audio- visual experience and group activities
			CO2:Neutralization of accent for intelligibility
			CO3:Speaking skills with clarity and confidence which in turn enhances their employability skills
			CO4:produce appropriate vocabulary and correct word forms
			CO5: Identify the topic and main idea
14	I/II	Engineering Chemistry Lab (Ch206bs)	CO1:Synthesize polymers
			CO2:Analyze ores and bleaching powder
			CO3:Estimate the Hardness of water in terms of Calcium and Magnesium ions
			CO4:Separate organic compounds using chromatographic techniques
			CO5:Standardize solutions using titration, conductivity meter, pH-meter, potentiometer and colorimeter
15	I/II	Engineering Mechanics (Me205es)	CO1:Determine resultant of forces acting on a body and analyse 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,
			CO5:Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.
16	I/II	Basic Electrical Engineering	CO1:Analyze and solve electric and magnetic circuits.
			CO2:Understand the principles of operation of DC machines, single phase transformers and three phase induction motors
			CO3:Identify the starting methods of starting synchronous and induction motors and speed control methods for DC motors
			CO4:Understand the principle of operation of moving coil, moving iron and dynamometer type instruments
			CO5:Understand the components of Low Voltage Electrical Installations
17	I/II	Basic Electrical Engineering Lab	CO1:Study different meters and instruments for measurement of electrical quantities
			CO2:Study the linear and nonlinear characteristics of different types of loads experimentally
			CO3:Design and experiment potential divider circuits
			CO4:Experimentally verify the basic circuit theorems
			CO5:Measure power and power factor in ac circuits


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M.Tech. Course Outcomes for the Academic Year 2020-2021

S.No	Year/Sem	Course Name	Course Outcomes
1	I/I	Mathematical Foundations of Computer Science	To understand the basic notions of discrete and continuous probability.
			To understand the methods of statistical inference, and the role that sampling distributions play in those methods.
			To be able to perform correct and meaningful statistical analyses of simple to moderate complexity
2	I/I	Advanced Data Structures	Understand the implementation of symbol table using hashing techniques.
			Understand the implementation of symbol table using hashing techniques.
			Develop algorithms for text processing applications.
3	I/I	Information Security	Identify suitable data structures and develop algorithms for computational geometry problems.
			Demonstrate the knowledge of cryptography, network security concepts and applications.
			Ability to apply security principles in system design.
4	I/I	Mobile Application Development	Ability to identify and investigate vulnerabilities and security threats and mechanisms to counter them.
			Student understands the working of Android OS Practically.
			Student will be able to develop Android user interfaces
5	I/I	Machine Learning	Student will be able to develop, deploy and maintain the Android Applications
			Extract features that can be used for a particular machine learning approach in various IOT applications.
			To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.
6	I/I	Network Security	To mathematically analyse various machine learning approaches and paradigms.
			To understand basics of security and issues related to it.
			Understanding of biometric techniques available and how they are used in today's world.
7	I/I	Cloud Computing	Security issues in web and how to tackle them.
			Learn mechanisms for transport and network security
			Identify security aspects of each cloud model
8	I/I	Data Mining	Develop a risk-management strategy for moving to the Cloud
			Implement a public cloud instance using a public cloud service provider
			Apply trust-based security model to different layer
			Learning how to gather and analyze large sets of data to gain useful business understanding.
			Learning how to produce a quantitative analysis report/memo with the necessary information to make decisions.
			Describing and demonstrating basic data mining algorithms, methods, and tools

			Identifying business applications of data mining
			Overview of the developing areas - web mining, text mining, and ethical aspects of data mining.
9	I/I	Advanced Data Structures Lab	Ability to select the data structures that efficiently model the information in a problem.
			Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			Implement and know the application of algorithms for sorting and pattern matching.
			Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and B-trees
10	I/I	Machine Learning Lab	Understand complexity of Machine Learning algorithms and their limitations;
			Understand modern notions in data analysis-oriented computing;
			Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
			Be capable of performing experiments in Machine Learning using real-world data
11	I/I	Research Methodology & IPR	Understand research problem formulation.
			Analyze research related information
			Follow research ethics
			Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
			Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular
12	I/II	Advanced Algorithms	Analyze the complexity/performance of different algorithms.
			Determine the appropriate data structure for solving a particular set of problems.
			Categorize the different problems in various classes according to their complexity.
			Students should have an insight of recent activities in the field of the advanced data structure
13	I/II	Advanced Computer Architecture	Able to know Computational models and Computer Architectures.
			Able to know Concepts of parallel computer models.
			Able to Scalable Architectures, Pipelining, Superscalar processors, multiprocessors
14	I/II	Web and Database Security	Understand the Web architecture and applications
			Understand client side and service side programming
			Understand how common mistakes can be bypassed and exploit the application
			Identify common application vulnerabilities
15	I/II	Internet of Things	The students will be thorough about the technology behind the IoT and associated technologies

			The students will be able to use the IoT technologies in practical domains of society
			The students will be able to gain knowledge about the state of the art methodologies in IoT application domains.
16	I/II	Data Science	Explain how data is collected, managed and stored for data science; Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists Implement data collection and management scripts using MongoDB
17	I/II	Cyber Security	1. Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure. 2. Design, develop, test and evaluate secure software. 3. Develop policies and procedures to manage enterprise security risks. 4. Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training. 5. Interpret and forensically investigate security incidents.
18	I/II	Advanced Computer Networks	Understanding of holistic approach to computer networking Ability to understand the computer networks and their application Ability to design simulation concepts related to packet forwarding in networks
17	I/II	Big Data Analytics	Identify Big Data and its Business Implications. List the components of Hadoop and Hadoop Eco-System Access and Process Data on Distributed File System Manage Job Execution in Hadoop Environment Develop Big Data Solutions using Hadoop Eco System
18	I/II	Advanced Algorithms Lab	The student can able to analyze the performance of algorithms Identify the problem given and find its solution using various algorithm design techniques. Compute time and space complexities of various algorithms. Implement algorithm design techniques such as Greedy approach, Dynamic programming to solve shortest path problems. Implement string matching algorithm for various applications like search engine queries, matching DNA sequences etc.
19	I/II	Data Science Lab	Use the various data collection and data analysis techniques. Use R tool for data analytics science. Implement K-means clustering, Linear Regression, and Logistic Regression. Implement Naïve Bayesian classifier and Decision Trees.

			Use Simulation tools for Data science and analysis.
20	I/II	Mini Project with Seminar	Demonstrate a sound technical knowledge of their selected mini project topic.
			Undertake problem identification, formulation and solution.
			Design engineering solutions to complex problems utilising a systems approach.
			Communicate with engineers and the community at large.
			Demonstrate the knowledge, skills and attitudes of a professional engineer
21	II/I	Digital Forensics	Understand relevant legislation and codes of ethics.
			Computer forensics and digital detective and various processes, policies and procedures.
			E-discovery, guidelines and standards, E-evidence, tools and environment.
			Email and web forensics and network forensics.
22	II/I	High Performance Computing	Understanding the concepts in grid computing
			Ability to set up cluster and run parallel applications
			Ability to understand the cluster projects and cluster OS
			Understanding the concepts of pervasive computing & quantum computing.
23	II/I	Deep Learning	Ability to understand the concepts of Neural Networks
			Ability to select the Learning Networks in modeling real world systems
			Ability to use an efficient algorithm for Deep Models
			Ability to apply optimization strategies for large scale applications


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MBA Course Outcomes for the Academic Year 2020-2021

S.No	Year/ Sem	Course Name	Course Outcomes
1	I-I	Management Organizational Behaviour	CO1: To understand the various attitude and personalities and perceptions and leadership and motivation and apply in organizational situations
			CO2: To evaluate the management and contribution of management thinkers
			CO3: To apply the relevance of environmental scanning ,planning and to take decisions
			CO4: To interpret the individual and interpersonal behavior process for team building and group behavior development
			CO5: To analyze the organizing and controlling
2	I-I	Business Economics	CO1: To understand and learn the basics of economic principles in business
			CO2: To illustrate determinants of supply and demand and Demand Analysis and Forecasting
			CO3: To develop production and cost estimates
			CO4: To analyze the market structure
			CO5: To develop the pricing strategies
3	I-I	Financial Accounting Analysis	CO1: To understand the basic concepts of financial accounting
			CO2: To summarize preparation of financial statement
			CO3: To develop the inventory valuation
			CO4: To analyze the accounting process
			CO5: To understand the interpretation of accounting concepts
4	I-I	Research Methodology & Statistical Analysis	CO1: To understand and learn basics of Research, Process of Research and elements of research Proposal
			CO2: To apply the various simple and advanced statistical tools
			CO3: To analyze the features and good research design
			CO4: To apply the principals of research methodology for various projects
			CO5: To understand the time series analysis and report writing
5	I-I	Legal and Business Environment	CO1: To understand all important legal provisions pertaining to Business Laws
			CO2: To Known the business laws related to incorporating a company
			CO3: To understand all important legal regulatory frame work in India
			CO4: To analyze the Law of Contract
			CO5: To develop the negotiable instruments
6	I-I	Project	CO1: To understand the importance of project management

		Management	CO2: To apply the project planning and execution and implementation CO3: To develop the significance of teams in projects CO4: To analyze the project evaluation techniques CO5: To evaluate the organizational behavior in project management
7	I-I	Business Communication Lab	CO1: To provide an overview of Prerequisites to Business Communication. . CO2: To provide an outline to effective Organizational Communication. CO3: To impart the correct practices of the strategies of Effective Business writing. CO4: TO Discuss the importance of ethical communication Ethics in Business Communication CO5: TO Evaluate and practice methods of analysis to assess the quality and reliability of a source
8	I-I	Statistical Data Analysis Lab	CO1: To understand the importance of project management CO2: To apply the project planning and execution and implementation CO3: To develop the significance of teams in projects CO4: To analyze the project evaluation techniques CO5: To evaluate the organizational behavior in project management
9	I-II	Marketing Management	CO1: Explain New Product Development & Product Life Cycle CO2: Explain Factors influencing pricing decisions CO3: Differentiate Product Vs. Brand CO4: Illustrate Selecting pricing method, Selecting final price. CO5: Explain Wholesaling, Retailing, Franchising, Direct marketing , ECommerce Marketing Practices
10	I-II	Financial Management	CO1: Explain the basic concept of financial management. CO2: Apply the tools from financial management this would facilitate the decision making i.e. Capital Budgeting, Ratio Analysis CO3: develop analytical skills this would facilitate the decision making in business situations CO4: Explain and use of financial analysis techniques i.e. Fund Flow, Cash Flow. CO5: Estimate working capital requirement of Business concern
11	I-II	Human Resource Management	CO1: Explain Nature of HRM, Scope, Functions and Objectives, HRM Policies and practices. CO2: Understand SHRM Model CO3: Design Human Resource Planning CO4: Implement Recruitment & Selection through different sources & tests CO5: Make Career Planning
12	I-II	Quantitative Analysis For	CO1: Explain Importance of Decision Sciences & Role of quantitative techniques In decision making CO2: Solve numerical on Assignment Models including special cases in Assignment models.

		Business Decisions	CO3: Solve numerical on Transportation Models by North West Corner method, Least Cost method, VAM method and Optimal Solution by using MODI Method
			CO4: Solve numerical on Linear Programming problems by graphical method
			CO5: Solve numerical on Markov Chains & Simulation Techniques
13	I-II	Logistics Supply Chain Management	CO1: Explain the importance, scope and functions of Operations and Supply Chain Management in Present Scenario
			CO2: Explain the term Quality and can related different dimensions of Quality affecting customer satisfaction.
			CO3: Explain different operations processes , and identify different types of process-product matrix
			CO4: Prepare a service blue print for given service providing organization
			CO5: Demonstrate the Production Planning and Control and its functions for effective and efficient operations management
14	I-II	Entrepreneurship	CO1: understand the nature of entrepreneurship
			CO2: understand the function of the entrepreneur in the successful, commercial application of innovations
			CO3: confirm an entrepreneurial business idea
			CO4: identify personal attributes that enable best use of entrepreneurial opportunities
			CO5: understand the function of the entrepreneur in the successful
15	I-II	Total Quality Management	CO1: Discuss quality and various contributors to Quality .
			CO2: Apply in-depth various QC tools
			CO3: Explain frameworks of Global Quality Awards.
			CO4: Discuss Strategic Quality management and its components.
			CO5: Apply Statistical Quality Control like process capability, Six Sigma quality, Process control , p charts and c charts, Process control for variables, X bar R chart
16	II-I	Production Operations Management	CO1: Gaining knowledge about managing production processes
			CO2: How to run operations effectively.
			CO3: Better understanding of modern production techniques
			CO4: Better understanding of quality management
			CO5: You will learn about practical applications of operations management to plan for the future.
17	II-I	Data Analytics	CO1: Data will be collected around the business case after careful evaluation of the business case in a particular domain.
			CO2: A Database with the data collected in the above step will be created using SQL.
			CO3: Connect the SQL database with Tableau/ Python/ R and extracting this data into environments
			CO4: Preparation of reports based on the business objective and context
			CO5: Building the dashboard using Tableau/ Power BI

18	II-I	Management Information System	CO1: Acquire on job the skills, knowledge, attitudes, and perceptions along with the experience needed to constitute a professional identity.
			CO2: .Get actual supervised professional experiences.
			CO3: Get insight into the working of the real organizations
			CO4: Develop perspective about business organizations in their totality
			CO5: Explore career opportunities in their areas of interest.
19	II-I	Performance Management Systems	CO1: Setting and defining goals to fulfill company objectives
			CO2: Setting the right expectations for managers and employees
			CO3: Effective communication between individuals and teams
			CO4: Determining individual training and performance plans
			CO5: Determining individual training and performance plans
20	II-I	Learning & Development	CO1: To develop an understanding of the evolution of training & development from a tactical to a strategic function
			CO2: .To provide an insight into what motivates adults to learn and the most appropriate methodologies to impart training
			CO3: To understand the concept of training audit & training evaluation
			CO4: To learn how design a training module and execute it
			CO5: To understand various strategies used by organizations to measure performance & reward for the same
21	II-I	Management of Industrial Relations	CO1: Students should able to elaborate the concept of Industrial Relations
			CO2: The students should able to illustrate the role of trade union in the industrial setup
			CO3: Students should able to outline the important causes & impact of industrial disputes.
			CO4: Students should able to elaborate Industrial Dispute settlement procedures.
			CO5: Student should be able to summarize the important provisions of Wage Legislations, in reference to Payment of Wages Act 1936, Minimum Wages Act 1948 & Payment of Bonus Act 1965
22	II-I	Security Analysis Portfolio Management	CO1: Explored to different avenues of investment.
			CO2: Equipped with the knowledge of security analysis.
			CO3: apply the concept of portfolio management for the better investment
			CO4: invest in less risk and more return securities
			CO5: Encourage students to apply stock and option valuation models in portfolio management
23	II-I	Financial Institutions Markets & Services	CO1: Understand the role and function of the financial system in reference to the macro economy
			CO2: .Demonstrate an awareness of the current structure and regulation of the Indian financial services sector
			CO3: Evaluate and create strategies to promote financial products and services.
			CO4: To enrich student's understanding of the fundamental concepts and working of financial service institutions

			CO5: To equip students with the knowledge and skills necessary to become employable in the financial service industry
24	II-I	Strategic Management Accounting	CO1: Explain how management accounting information is used in strategic decision making.
			CO2: Illustrate the process of strategy formulation, communication, implementation and control within an organization.
			CO3: Explain how to integrate conventional and contemporary management accounting techniques into a strategic management accounting framework
			CO4: Solve practical and applied problems by using research papers and case study analysis
			CO5: Identify and evaluate the business strategies of contemporary organisations, based on an understanding of their internal and external environments;
25	II-I	Summer Internship	CO1: Acquire on job the skills, knowledge, attitudes, and perceptions along with the experience needed to constitute a professional identity
			CO2: Get actual supervised professional experiences
			CO3: Get insight into the working of the real organizations
			CO4: Develop perspective about business organizations in their totality
			CO5: Explore career opportunities in their areas of interest
26	II-II	Strategic Management	CO1: Explain the importance, scope and concept of Strategy and Strategic Management Process
			CO2: .differentiate between Tactics, Strategies and Planning and importance of each component in Strategic Management
			CO3: Prepare Vision, Mission statements and define goals, objectives for Organization
			CO4: Identify Critical Success Factors. Key Performance Indicators and Key Result Areas for any given service sector
			CO5: Demonstrate the importance of external environmental analysis as well prepare PESTLE Analysis and ETOP model for decision making
27	II-II	International Human Resource Management	CO1: Describe the role of the HR Manager in an International context
			CO2: .Describe Human Resource activities in an International Context
			CO3: List and explain the differences between domestic and international HRM
			CO4: Explain the importance of cultural sensitivity in an international assignment
			CO5: Critically appraise the impact of cultural and contextual factors in shaping human resource practices in MNCs
28	II-II	Leadership and Change Management	CO1: Can explain how the particular context of public organizations influences change management and leadership.
			CO2: Is able to apply the key concepts of this course in a systematic analysis of an organizational change process in a public organization
			CO3: Has developed the ability to stay informed about current leadership developments and trends through online

			resources and networks
			CO4: Can describe the characteristics of central change management approaches and leadership theories
			CO5: Is able to formulate and effectively communicate a change vision in an organizational setting.
29	II-II	Talent and Knowledge Management	CO1: Evaluate the potential and appropriateness of talent development strategies, policies and methods with reference to relevant contextual factors.
			CO2: Assess the role and influence the politics of knowledge management policy and practice in a range of contexts
			CO3: Express the nature of knowledge management alternative views of knowledge, types of knowledge and concept of location of knowledge
			CO4: Examine the purpose of developing a talent management information strategy and the role of leaders in talent management
			CO5: Express the nature of knowledge management alternative views of knowledge, types of knowledge and concept of location of knowledge
30	II-II	International Financial Management	CO1: Understand international capital and foreign exchange market
			CO2: Identify and appraise investment opportunities in the international environment.
			CO3: Identify risk relating to exchange rate fluctuations and develop strategies to deal with them
			CO4: Develop strategies to deal with other types of country risks associated with foreign operations
			CO5: Express well considered opinion on issues relating to international financial management.
31	II-II	Strategic Investment & Financing Decisions	CO1: Understand the risk, uncertainty, risk analysis in investment decisions, risk adjusted rate of return and certainty equivalents.
			CO2: Enumerate the investment decisions under capital constraints like capital rationing, portfolio risk and diversified projects.
			CO3: Explain the concept of multiple internal rate of return, Modified internal rate of return, pure, simple and mixed investments
			CO4: Determine the Lorie savage paradox, adjusted net present value and know the impact of inflation on capital budgeting decisions.
			CO5: Discuss the concepts of lease financing, leasing Vs. Operating risk, borrowing vs. procuring, hire purchase and installment purchase decisions
31	II-II	Risk Management & Financial Derivatives	CO1: Be able to describe standard derivative contracts, their properties and functionality
			CO2: Be able to understand and apply scientific methods for valuation of options and other derivatives, in continuous and discrete time.
			CO3: Be able to interpret and apply risk measures that are commonly used in risk management.
			CO4: Be able to reflect over and critically survey different assumptions and principles behind derivatives pricing and risk management.
			CO5: Demonstrate an understanding of pricing forwards, futures and options contracts